INTERNALISING THE SOCIAL COSTS OF TRANSPORT

Chapter 4

The Art of Internalising

by A.N. Bleijenberg
Introduction

There is broad support for the idea that road users should pay the full share of their costs, including environmental costs. This is not only the view of economists keen to ensure proper functioning of the market mechanism; at the political level, too, this is considered a desirable goal. It was confirmed, for example, by the European Conference of Ministers of Transport (see ECMT, 1989). In its White Paper on the Common Transport Policy, the European Union (EU) also supports the idea of full cost allocation (CEC, 1992). Among others, the Dutch government has also made pricing a key element of its traffic policy (SVV, 1988).

However, between this general aspiration and concrete policy measures there is a yawning gap. The Dutch government’s main recommendations for increasing the price of road traffic (road pricing and toll collection) were voted down in parliament. Real fuel taxes in Europe (inflation-corrected) have probably decreased, rather than increased over the years. Even the recent EU agreement on the minimum vehicle tax level for trucks and the so-called "Euro-vignette" will mean only a slight improvement in cost allocation.

What is behind this gap between general aspirations and concrete policy? This is the key question addressed in this paper, which, after setting out a largely economic analysis, provides suggestions for achieving true internalisation of all traffic costs.

The problem of cost internalisation is virtually congruent to that of abolishing or reducing subsidies. Compare, for example, the complex and lengthy decision-making process surrounding potential cuts in the EU’s agricultural subsidies. Those most directly affected protect their interests vigorously, frequently claiming that it is not only their interests that are threatened, but the public interest as well. Whether the assumption is right or wrong, this presumed negative impact on the national economy subsequently weighs relatively heavily in the processes of public opinion-forming and political decision-making. For this reason, an essential step towards reducing subsidies -- or allocating costs -- is an independent analysis of the major consequences involved. Such an analysis should not be coloured by sectoral economic interests. Provided it is prudently conducted, this kind of analysis can serve as the foundation for the required public and political support.

This paper first reviews the main background and impact of internalising transport costs. This is not intended as a comprehensive analysis; rather, it is intended to serve as an outline summary of current knowledge. Topics covered include economic and social effects, and the need for international harmonisation. Based in part on this analysis, the policy instruments available for internalising traffic costs
are then discussed. The paper concludes by considering the elements of process to be followed to arrive at true internalisation: the Art of Internalising.

Analysis

This section provides a brief review of the main background and impact of internalising traffic costs, covering the following topics:

- road traffic costs;
- historical price trends;
- tax considerations;
- economic consequences;
- social consequences; and
- the international dimension.

Table 4.1. Road-traffic-related expenditure by the Netherlands government (1987)

<table>
<thead>
<tr>
<th>Type of cost</th>
<th>Costs</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Billion DFL</td>
<td>Share (%)</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>5.8</td>
<td>51</td>
</tr>
<tr>
<td>Policing</td>
<td>1.0</td>
<td>9</td>
</tr>
<tr>
<td>Government personnel</td>
<td>2.3 - 4.3</td>
<td>29</td>
</tr>
<tr>
<td>Tax expenditure and subsidies</td>
<td>1.3</td>
<td>11</td>
</tr>
<tr>
<td>TOTAL</td>
<td>10.4 - 12.4</td>
<td>100</td>
</tr>
<tr>
<td>Share of GDP (%)</td>
<td>2.9</td>
<td></td>
</tr>
<tr>
<td>Average per vehicle kilometre</td>
<td>0.14 Fl./km</td>
<td>0.58 ECU/Km</td>
</tr>
<tr>
<td>Average per litre of fuel</td>
<td>1.21 Fl./l</td>
<td>0.58 ECU/l</td>
</tr>
</tbody>
</table>

Source: Calculated using data from Van der Kolk (1989) and Dutch CBS statistics.

Road traffic costs

The following three kinds of road traffic costs can be distinguished:

- direct costs: depreciation, maintenance, insurance and fuel;
- government expenditure on infrastructure, policing and the like; and
- external costs resulting from traffic accidents and environmental pollution.

For the situation in the Netherlands, a detailed review has been made of all government expenditure relating to road traffic (Van der Kolk, 1989). This expenditure is not only for the construction and
maintenance of infrastructure, but also includes policing and the cost of government road transport-related personnel. Tax benefits and subsidies are also included. Table 4.1 shows the main results of the study. This review indicates that infrastructure expenditures account for only half of overall road-traffic-related expenditures by the various echelons of government. To permit international comparison, government expenditure is also expressed in terms of GDP, traffic volume, and fuel consumption.

The other side of the government balance sheet shows substantial tax revenue from fuel excise duties ("fuel tax"), vehicle taxes and sales taxes. In 1987, this vehicle-related tax revenue totalled 10.3 billion guilders. The government books are thus approximately balanced.

The third cost category includes external costs -- the consequences of traffic accidents and environmental pollution, to the extent that these are not yet passed on to the motorist (e.g. via car insurance). Over the past ten years, many studies have been devoted to assessing the magnitude of these external costs. Several of these are discussed in detail elsewhere in this volume. In this paper, reference is made only to a review study (Neuenschwander and Walter, 1992). Based on the results of 11 studies, these researchers conclude that external traffic costs probably lie between 1.5 and 2.5 per cent of GDP. Table 4.2 specifies the various types of external cost.

On the basis of these figures for government expenditure and external costs, fuel taxes should stand at a level of at least 0.90 to 1.10 ECU/litre, if all of these costs are to be allocated to users in fuel prices. Proceeding from the assumption that one half of government expenditure should be passed on via standing taxes (see Kågeson, 1993), fuel taxes should stand at approximately 0.60 to 0.80 ECU/l. Kågeson (1993) in fact gives a slightly higher figure: a minimum fuel tax of 0.70 - 1.05 ECU/l. All these figures are clearly higher than present European fuel tax rates, which, at a rough estimate, are 0.40 ECU/l for unleaded petrol and less than 0.30 ECU/l for diesel fuel.

**Table 4.2. Probable values of external traffic costs**

<table>
<thead>
<tr>
<th></th>
<th>0.4 - 0.7% GDP</th>
<th>0.1 - 0.6% GDP</th>
<th>0.1 - 0.5 GDP</th>
<th>0.3 - 0.9% GDP</th>
<th>0.1 - 0.5% GDP</th>
<th>1.5 - 2.5% GDP</th>
</tr>
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<tbody>
<tr>
<td>Air pollution</td>
<td></td>
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<tr>
<td>Noise</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other environmental effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accidents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Congestion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>0.03 - 0.06 ECU/km</td>
<td>0.31 - 0.52 ECU/l</td>
<td>1.5 - 2.5 % GDP</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The aim of the foregoing discussion is not to give a precise picture of aggregate road traffic costs. This is an issue that is addressed in far greater detail elsewhere. The purpose of this cost review is merely to demonstrate that road traffic does not pay for all the costs that it incurs. Based on even cautious assumptions, fuel tax rates should at least be doubled, for example.

**Historical price trends**

If pricing changes are to be implemented, it is prudent to introduce them gradually, making at least partial allowances for historical price trends. In the present context, it is not feasible to analyze trends in all relevant taxes and costs and I shall restrict myself to reviewing the price trend of regular petrol and diesel fuel in the Netherlands. Figure 4.1 shows that, in real terms, the price of petrol in the Netherlands actually decreased by 1.5 per cent between 1980 and 1993. Over the same period, the real price of diesel fuel increased by almost 6 per cent (Figure 4.2); this was because European harmonization of diesel fuel tax meant that the Netherlands was obliged to increase the national tax rate to the "European" level. For both types of fuel, the drop in real oil prices in the period under consideration was compensated by an increase in real tax rates.

Real price trends in the Netherlands probably do not differ significantly from the average for the rest of Europe. All in all, real pump prices will not have changed much in recent years.
**Tax considerations**

A major point to be considered in the context of traffic cost internalisation is the use to which the extra tax revenue is to be put. It can be argued that those who suffer the damage or nuisance should receive due financial compensation. Frequently, however, the "victims" cannot readily be identified, since every inhabitant is in a certain sense a victim. In addition, most governments have already developed mechanisms for (re-)distributing the costs and benefits of many societal activities. It would seem prudent to adhere to current practice, and not to create new institutions. This implies that the government would receive additional tax revenue, which could, in principle, be used for a multitude of ends. Certain specific groups of "victims" might conceivably receive financial compensation. However, the lion's share should be used to benefit all citizens and businesses, by reducing other tax rates. After all, the aim of internalisation is not to generate extra tax revenue, for reducing the budget deficit, for example, or for financing extra government expenditure.

The government may, of course, wish to increase taxes, or perhaps to pay for new investments in public transport, but this should not be confused with internalisation. Any such confusion will form a substantial barrier to creating a public basis for accepting the idea of internalisation.

The above implies that internalisation of traffic costs will lead to a shift in taxes. From the fiscal point of view, there are also good reasons to make such a shift. Today, taxes are levied largely on the production factor, labour, and only marginally on the consumption of raw materials and on environmental pollution. The current tax regime thus acts as a brake on employment, and is not in line with the aims of environmental policy. This is not surprising, since current tax systems have their roots in an era when environmental pollution was not yet generally considered to be a problem. In general, it would be desirable to adapt the tax regime to modern circumstances.

To illustrate the merits of such a tax shift, Table 4.3 illustrates the tax mix for the Netherlands over the past few decades, as well as the situation following internalisation of traffic costs on the basis of the minimum estimate (i.e. 1.5 per cent of GDP).
Table 4.3. Tax mix in the Netherlands (national taxes and part of social security payments)

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Labour^1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>66%</td>
</tr>
<tr>
<td>Raw materials and environment^2</td>
<td>12%</td>
<td>9%</td>
<td>12%</td>
<td>8%</td>
<td>9%</td>
<td>12%</td>
</tr>
<tr>
<td>Other^3</td>
<td>40%</td>
<td>31%</td>
<td>20%</td>
<td>19%</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>Overall tax burden^1</td>
<td>31%</td>
<td>30%</td>
<td>36%</td>
<td>42%</td>
<td>44%</td>
<td>44%</td>
</tr>
</tbody>
</table>

Notes: 1. Taxes on wages and income, and social security contributions to the extent that benefits are not specifically for employees.
2. Excise duties, financing charges, vehicle tax and land tax.
3. VAT divided proportionally over the categories "labour" and "other", according to their respective shares in added value.
4. These national taxes and social security contributions as a percentage of Gross Domestic Product (at factor cost).
5. After "minimum internalisation" of traffic costs.

Source: CBS, based on CBS National Accounts.

Economic consequences

Internalising all traffic costs will result in more expensive transport. In turn, this will mean a certain decrease in the turnover of some branches of industry, instead of growth in turnover under an unchanged policy regime. It is impossible to state unequivocally whether this will lead to a shrinking of these sectors in absolute terms, or whether there will be a slackening of growth. These negative effects may be felt in the transport sector, the automotive industry, the road construction industry, refineries, garages, or petrol stations. Relative loss of turnover will then mean a reduction in employment levels in these sectors and a smaller share in GDP (added value).

Nevertheless, this does not necessarily mean that internalisation will have a negative impact on economic growth and overall employment. Offsetting the sectors confronted with unfavourable effects, there may also be "winning" sectors. Which these are depends on how the extra tax revenue is recycled to citizens and businesses (see above). If the currently high level of taxation on labour were reduced, it would be mainly labour-intensive sectors that would benefit. Across the board, then, there may even be a net positive effect on employment.

Alongside these -- probably minor -- shifts in the structure of production, there may also be slight changes in consumption patterns. Consumers will buy cheaper cars and drive less. On the other hand, there will be greater expenditures on recreation, home furnishings, and public transport (for example, see Bleijenberg et al., 1990).

This set of shifts in the economy has been studied using a computer model of the Dutch economy (Bleijenberg et al., 1990). In this study, the effects of seven policy packages to restrict (auto)mobility were considered. In Table 4.4, the results are summarised for three of these packages:

- Package 2: raising fuel taxes by Dfl. 1.00/l (0.45 ECU/l), with full restitution of the ensuing tax revenue through a lowering of income tax rates;
• Package 6: raising fuel taxes by Dfl. 1.50/l (0.68 ECU/l) and abolishing vehicle tax, with restitution of the remaining tax revenue through a lowering of income tax rates; and
• Package 7: non-financial policy instruments, such as car-pooling, physical planning measures and public education.

The first two of these policy packages entail a tax shift as described in the previous section. The main conclusion to be drawn from this modelling exercise is that even a substantial increase in fuel tax would have only a minor macro-economic impact. The calculated effects are well within the margins of uncertainty inherent in existing economic forecasts.

In addition to this major conclusion, several other trends can be derived from the modelling calculations. Following a tax shift (packages 2 and 6), there is indeed a slight growth in employment. This is due mainly to the decrease in wage costs. Although jobs are lost in the (road) construction and automotive industries, there is a greater growth in employment in other branches of industry, as well as in the services sector. Overall production volume also falls slightly. However, it is above all government expenditure that decreases, as reflected in the lower overall tax burden, and in the unchanged volume of private consumption. The calculations do, however, indicate a shift in consumption patterns from car ownership and use, towards more recreation, home furnishing and public transport.

Table 4.4. **Macro-economic consequences ten years after implementation of given policy measures (modelling calculations for the Netherlands)**

<table>
<thead>
<tr>
<th></th>
<th>Package 2</th>
<th>Package 6</th>
<th>Package 7 Non-financial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Dfl. 1.00/l</td>
<td>- Dfl. 1.50/l</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Lower income tax</td>
<td>- No vehicle tax</td>
<td></td>
</tr>
<tr>
<td>Budget balance</td>
<td>c) O.1</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Tax burden (taxes + social security payments)</td>
<td>c) -1.3</td>
<td>-1.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Employment</td>
<td>a) 0.2</td>
<td>0.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Private consumption (volume)</td>
<td>a) -0.4</td>
<td>-0.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Inflation</td>
<td>b) 1.9</td>
<td>1.8</td>
<td>-0.1</td>
</tr>
<tr>
<td>Labour costs per job</td>
<td>a) -0.8</td>
<td>-1.9</td>
<td>-0.1</td>
</tr>
<tr>
<td>Balance of payments</td>
<td>c) 0.5</td>
<td>0.5</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Notes:**
1. Units are expressed as a difference relative to continuation of present policy:
   a) in %;
   b) in % points; and
   c) in % points of Dutch national income.

**Source:** Bleijenberg et al. (1990).

The calculations also indicate a single extra 1-2 per cent leg of inflation, following introduction of the packages which involve a tax shift. Viewed in the long term, though, this represents only minor additional inflation. There is also a measurement problem involved in determining this extra inflation, however, since it is calculated on the basis of a fixed set of goods and services, while the envisaged tax shift
is aimed precisely at changing consumption patterns. If this is duly accounted for, the extra inflation will be even less than indicated in Table 4.4. Moreover, the effect on inflation depends on the tax cuts that are assumed. If the increase in fuel tax is compensated entirely by a decrease in VAT, or by lower social security contributions by employers, a first-order approximation indicates no extra inflation whatsoever.

Obviously, these modelling calculations for the Netherlands cannot automatically be transposed to other countries, which may, after all, have a different economic structure. The Netherlands has a relatively small automotive industry and a relatively large refinery sector. Nonetheless, even in other European countries, it appears likely that there will be only a minor impact on economic growth and a small positive effect on employment. There are three arguments pointing in this direction:

- On theoretical grounds, it is to be expected that a tax shift will lead to shifts in the economy, rather than to an increase or decrease in growth;
- This is reflected in the modelling calculations for the Netherlands; and
- Macro-economic calculations of the consequences of an energy/CO₂ tax ("carbon tax") in the EU show the same trend (for a review study, see Bakker, 1992, and for a more recent study, see DRI, 1993).

To conclude this section, let us return to the branches of industry most likely to be affected by an internalisation of traffic costs. Their share in GDP and employment will decrease, without this being anticipated to have an adverse impact on the economy as a whole. This said, however, the tempo of this economic transition should be such as to avoid loss of capital and social hardship. If this transformation proceeds too rapidly, additional expenses will arise. This argues in favour of gradual, step-by-step introduction of full cost allocation.

**Social consequences**

The internalisation of traffic costs may affect income distribution. This should be considered an unintentional side-effect, however, and additional income policy measures will therefore be required to correct for unwanted shifts in income distribution. Research has shown that this is feasible in practice, by careful design of tax cuts, and possibly by modifying income tax rates (Bakker and Bleijenberg, 1991).

In essence, cost internalisation is completely unrelated to income distribution. These two policy areas each have their own aims and instruments. The argument sometimes heard against internalisation -- that "the rich" will still be able to drive their car, while "the poor" will not -- does not stand up to scrutiny. In the present situation, "the rich" already have far more options than "the poor", and cost internalisation will not in itself change things one way or another. Those with objections to the present distribution of incomes should debate *that* issue, rather than using it improperly as an argument against certain pricing measures.

By way of conclusion, Figure 4.3 shows the relation between income and car fuel consumption. In the Netherlands fuel consumption is found to increase more rapidly (in percentage terms) than income. Measured as a percentage of net income, any increase in fuel tax will therefore constitute a greater burden on those with a higher income. Without supplementary income policy measures, then, there will be a slight levelling out of income differences.
The international dimension

Internalisation should be achieved in such a way that international competition is not affected. Individual countries will not readily be willing to take measures that damage their competitiveness. At the moment, if anything, we are seeing the opposite trend. Governments take a lenient stance towards the internationally-operating businesses in their country, with the aim of improving their competitiveness so that more employment and added value can stay within the domestic economy. This mechanism is sometimes termed "policy competition". Since this is the case in every country, the net effect is small, and the main consequence is that the internationally-operating businesses are usually "let off lightly" under government policy. Such is generally the case in the areas of taxation and environmental policy, for example.

Internalisation of traffic costs should therefore be seen in the light of considerations of international competitiveness. Three topics are discussed in this section:

- petrol tourism;
- the road haulage sector; and
- international businesses.

Petrol tourism

For small countries in particular, "petrol tourism" is a major consideration in setting the excise duty on fuel. In the Netherlands, for example, this issue plays a major role in the political decision-making process and there is a fairly strong petrol station lobby in the border regions working to ensure that there is no further increase in the difference in the price of fuel relative to the neighbouring countries. In the Netherlands, various studies have been conducted into this form of tourism. With a price difference of 0.30 to 0.35 Dfl/l (0.14 to 0.16 ECU/l) relative to Belgium and Germany, 2.8 per cent of petrol sales take place across the border (Blok and Muizer, 1990). In addition, 10 million extra car-kilometres are driven to refuel
across the border and an estimated 615 jobs are lost. Based on these considerations, the Dutch government feels a price difference of 0.35 Dfl./l (0.16 ECU/l) to be the maximum acceptable. The policy scope in the Netherlands is thus clearly delimited by excise duty rates in neighbouring countries.

Petrol tourism will be less significant in larger countries such as France and Germany, and in countries with a sparsely populated or inaccessible border region -- Denmark, for instance. These countries consequently have greater policy leeway for setting their own fuel tax rates and thus for internalising traffic costs. They could take such an initiative when the European excise duty rate is raised. A situation would then arise in which smaller countries with a low rate would benefit from their neighbours' policy. At the moment, this holds true for Luxembourg and Switzerland. Energy statistics indicate that average per capita motor fuel consumption in Luxembourg is about three times that in France or Germany. Roughly two-thirds of motor fuel sales in Luxembourg are therefore to foreigners and come under the category of petrol tourism. The extra excise revenue constitutes an estimated 2-3 per cent of Luxembourg's GDP, equivalent to about 500 ECU per capita. These calculations indicate that Luxembourg will not readily be willing to give up its revenue from petrol tourism.

To set limits on such "free rider" behaviour, the minimum fuel tax rate set by the EU should be increased. A major problem here is that such a move requires a unanimous decision by the Council of Ministers. It would also be desirable for Switzerland and Austria to conform to the EU's minimum rates.

If internalisation is achieved by means of road-pricing or toll collection, these problems of petrol tourism can be avoided (see also below). A major drawback of these options, however, is that they do nothing to encourage introduction of more fuel-efficient vehicles or a more fuel-efficient driving style -- two trends that could make a major contribution to reducing the environmental impact of transport (e.g. Rutten et al., 1990 and IEA, 1993). In addition, a high fuel tax is the most straightforward and effective instrument for achieving these environmental benefits. Even if road-pricing schemes were introduced, it would be desirable for traffic costs to be at least partly internalized via the excise duty on fuels.

*Road haulage companies*

Increasing the cost of transport must obviously be carried out without discriminating between domestic and foreign haulage companies. This will be closely supervised by the EU. Assuming that haulage firms of every nationality will have to pay the same duties and taxes, the competitive configuration among these firms will remain unchanged, even if one country introduces internalisation, while another does not. All haulage firms will endeavour to minimize their costs, by optimizing their refuelling strategy on every route, for example. Fuel tax increases, road-pricing and toll collection will therefore not upset international competitiveness among these companies. National differences in vehicle tax rates, on the other hand, may benefit one firm to the detriment of another. In this connection, it is important that the EU set a minimum vehicle tax for trucks. However, this tax is so low as to encourage a trend to lower the vehicle tax in some countries, because of competition considerations with other member states (in Germany and the Netherlands, for instance, as compensation for a higher tax on diesel fuel and/or the cost of the Euro tax disk). It is desirable to raise the EU minimum, and to give countries with substantially lower rates the time to gradually raise their vehicle tax. The other European countries might also conform to these EU arrangements.

This said, it should also be stated that increasing the diesel fuel tax would have several drawbacks with regard to arriving at correct cost allocation. In the first place, a truck with a full fuel tank is able to traverse such large distances that a major proportion of the fuel tax can be paid in a different country from that where the infrastructure is used. For this reason, no great discrepancies will arise between fuel tax rates in different countries and, in practice, the trend will be set by the EU minimum rate. The scope for increases in this minimum will therefore also be governed by the fuel taxes in neighbouring, non-EU countries (Switzerland, Austria, Poland, Czech Republic, etc.).
Second, fuel consumption is not directly related to the cost of damage to the road grid. If costs are internalized in the diesel fuel tax, heavy trucks will probably pay too little, given their relatively high loading of the road track. For these two reasons, it is desirable to introduce a form of road-pricing, with tax being paid on the basis of vehicle weight, and increased according to the mileage driven in the country in question. This system should of course be harmonized throughout Europe and might serve as a forerunner for the general introduction of road-pricing. Until the actual realization of such a system, fuel tax, vehicle tax, toll collection and the Euro tax disk offer sufficient scope for internalising traffic costs.

**International companies**

The final point to be considered is whether a given country might become less attractive to international business after the internalisation of traffic costs. In the Netherlands, for example, this argument is often heard in the traffic policy debate. As remarked earlier, a kind of "policy competition" has developed among countries, to vie for the favours of international business. Together with other factors, the level of various taxes and the quality of transport systems determine a country's appeal. However, it is by no means clear that a higher price for transport will result in a decrease in a country's competitiveness. In the first place, apart from the transport sector, there will be only small increases in product prices for other branches of industry (Bleijenberg et al., 1990). Second, the higher cost of transport will be offset by lower rates for other taxes, which will in fact give the country greater appeal for international business. The choices made in lowering tax rates are obviously of influence in this respect. Third, internalisation of traffic costs will lead to less congestion, which is favourable for the business climate.

To my knowledge, no studies have been conducted into the ultimate effect of these contradictory influences on a country’s appeal to international business. It seems likely that traffic cost internalisation will have little impact on business climate. It is even possible there will in fact be a net positive effect.

**Policy instruments**

Having analyzed the effects of transport cost internalisation, this section reviews the main policy instruments available for achieving that internalisation. In selecting appropriate instruments, besides the aim of avoiding undesirable effects wherever possible, considerations of practicality and technical implementation also play a role. In addition, no attempt is made here to deviate from current policy practice. In considering policy options, a distinction can be made between the possibilities offered at the national and European level (see above).

**National level**

The scope for raising fuel tax rates at the national level may differ widely from country to country. Countries with a relatively low tax on petrol at the moment can increase this excise duty substantially without any significant economic consequences. To limit the economic impact, a gradual increase, and a prudent choice of associated tax cuts are required.

In smaller countries, "petrol tourism" may be of considerable influence, motivating governments to maintain a lower fuel tax (Luxembourg, for example), or to set a limit on the maximum price difference with neighbouring countries (the Netherlands, for example). Larger countries have greater policy leeway to raise the petrol tax at the national level. Irritation at the financial profit made in neighbouring countries may also imply limits to how far the petrol tax can be raised unilaterally by the larger countries. In the case of diesel fuel tax, there is probably less scope for deviation from the "European" level than with petrol. Otherwise, the same considerations hold.
In summary, national policy leeway for a unilateral increase in fuel taxes depends on the price a country is prepared to accept in terms of lost fuel sales and accompanying excise duty revenues. For smaller countries and for diesel fuel, there is less policy leeway than for larger countries, and for petrol.

Other pricing measures are relatively easy to implement at the national level. This is the case for toll collection, road-pricing, tax disks (for national trunk roads and trucks, and perhaps only during rush hours) and parking rates. Here, too, introduction should be gradual and accompanied by a prudent choice of tax cuts. Internalisation of traffic costs can probably be largely achieved by these means, without requiring agreement at the international level. Nonetheless, it can be queried whether this national approach is preferable, for it may give rise to a wide variety of schemes (e.g. tax disks and electronic road-pricing equipment), which may then form a barrier to international trade. It seems sensible to strike a balance, with sufficient measures being taken at the European level to keep the number of national schemes within acceptable bounds (see below).

**International level**

The minimum rates set by the EU for fuel tax and for the vehicle tax on trucks can be raised in the short term. For these policy instruments, an international approach is preferable because there is only limited policy leeway at the national level (with the exception of petrol taxes in the larger countries). It is above all the possible shifts in fuel sales that will restrict the scope for raising excise duties at the national level. A European increase in these taxes will also constrain the introduction of different national systems of cost allocation. It is also desirable that non-EU countries conform to the higher minimum rates for fuel tax and vehicle tax for trucks. Otherwise, they stand to profit financially from EU policy, reducing the social acceptance of such measures in EU countries. In this context, the position of Switzerland and Austria is particularly important, because of their central location in Europe.

In the longer term, the introduction of a single, harmonized system of electronic road-pricing throughout Europe would constitute an attractive proposition. However, to avoid introduction of a variety of different schemes, agreement on technical harmonization should not be delayed for too long.

For achieving proper cost internalisation, electronic road-pricing has several important advantages:

- payment takes place in the country (or region) where the infrastructure is used, and where the environment polluted;
- a supplementary tariff can be introduced for congested areas, as well as for rush hours;
- the emission characteristics of the vehicle can be incorporated into the price;
- vehicle weight can also be used as a parameter for assessing tariffs, permitting a better indication to be made of infrastructure costs; and
- it can take the place of existing toll collection, tax disk and vehicle tax systems.

When designing electronic road-pricing systems, due attention should be devoted to user-friendliness, fraud vulnerability and protection of privacy, matters that have come up during the Dutch political debate on this issue. Analogously to the present EU minimum rates for fuel taxes, minimum road-pricing rates should also be set. Ultimately, a methodology for obligatory allocation of all transport costs can be established within a European framework. In this way, existing national differences in such matters as infrastructure costs and the public cost of traffic accidents can be duly accommodated (see Kågeson, 1993).

So, in the longer term, it is feasible to achieve full, and economically correct, internalisation of traffic costs through a combination of fuel taxes and electronic road-pricing.
The art of internalising

In the preceding sections, the effects and perspectives of internalising traffic costs have been discussed and, overall, the picture is seen to be fairly favourable. Although there may be negative economic consequences for certain branches of industry directly concerned with transport, these are offset by positive consequences in other branches. On balance, economic growth is scarcely affected, and there may even be a slight increase in employment. With regard to technical implementation, there are also fairly simple and effective policy instruments available for achieving proper cost allocation. Alongside the scope for decision-making on the part of national governments, however, action must also be taken at the European level. It is well known that national interests may result in lengthy delays in effective European policy-making. This represents an obvious risk factor in achieving full traffic cost internalisation.

Figure 4.4 The art of internalising

<table>
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<tr>
<th>Analysis</th>
<th>- background</th>
<th>- effects</th>
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To my mind, however, the major obstacle to internalisation is the almost total lack of public and political support for increasing the price of traffic -- both at the national and the European level. This is clearly reflected in the decision-making processes at these two levels. It is sometimes only after prolonged public opposition that minor increases in excise duty rates are passed by national parliaments or by the EU Council of Ministers. These "increases" are scarcely sufficient to keep pace with inflation. In many cases, there is even a taboo on researching the true cost of traffic. A recent opinion survey held in the Netherlands showed that 66 per cent of those questioned were of the opinion that car drivers were being exploited by the government. Although this is untrue (see earlier discussion), it means that there is insufficient public support for any form of internalisation. It is therefore absolutely crucial that adequate public support be created for traffic cost internalisation.

The first step towards achieving this goal is independent research, particularly research into the present cost structure and the major effects of internalisation. These topics have been covered briefly earlier in this paper. It is unavoidable in such research that some of the attitudes and opinions held by certain
branches of industry have to be subjected to a critical analysis, and sometimes contested. For this reason, it is a prerequisite that this research be independent. In addition, such research should distinguish between "real" and "reputed" objections to internalisation.

The second step would be to organize good public education programmes on the main research results, for instance:

• government expenditure on traffic and government revenue from traffic-related taxes;
• information on traffic accidents and environmental pollution, and the financial valuation of these external effects;
• historic trends in real (i.e. inflation-corrected) traffic-related taxes;
• the fact that traffic cost internalisation represents a shift in the tax structure, rather than an additional tax; and
• the main economic and social effects of traffic cost internalisation.

This step would be aimed at increasing public understanding, and thereby at improving public support for cost internalisation. The third and last step would be to design and present a carefully balanced policy plan. This step should comprise:

• gradual, step-by-step introduction of internalisation of all traffic costs, creating a clear long-term picture and also avoiding, as far as possible, social problems and loss of capital;
• tax cuts to accompany internalisation, designed to avoid undesired side-effects; and
• an analysis of the main economic and social effects of the policy plan.

This policy plan would then obviously have to run the normal course of political decision-making. Figure 4.4 summarises the Art of Internalising.

REFERENCES


**NOTES**

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It is sometimes claimed that traffic also has external benefits. However, a study of the scientific literature on the subject gives no indication that these are of any significant magnitude (Van Gent and Vleugel, 1991; Walter *et al.*, 1993). The existence of such benefits would constitute an argument for continued subsidization of traffic.