



The road pricing controversy - review of the related argumentation and proposal

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Abstract

The severe environmental problems that modern European cities face (pollution, noise, accidents, congestion) are caused by the excessive use of the private car. To cope with them, great emphasis is given in the improvement of public transport and the encouragement of walking and cycling. Moreover, Road Pricing is a new economic approach of the transport sector, that can be summarised as the internalisation of the external costs of transport. According to it, the users of transport modes will have to pay for the cost their activity imposes to the environment and society. This is to be implemented in the urban scale through the electronic urban tolls. The representatives of the road transport branch strongly oppose to Road Pricing, and broad argumentation has been developed in the recent political debate. These representatives consider that road transport sector is already overtaxed, and even put into question the matter of external costs. Also, they predict serious negative impacts in the competitiveness of Europe's economy and industry, employment and development, if Road Pricing is implemented. However, for some points of view, Road Pricing represents the unique effective tool for transport policy. The implementation of urban tolls could possibly have negative side-effects in the city's social cohesion and urban structure, that must be taken into account when designing a Road Pricing urban system. The issue of compensation of those who will no more afford to pay for the charges of car use must be taken into account, in terms of the offered mobility to all parts of the city. The extra revenues must remain in the transport sector, and finance the improvement of public transport.



1 The environmental problems of the European cities

Nowadays, European cities face severe problems that rise from increased traffic, and especially from excessive car use. Air pollution is a severe impact of human activities, that kills more than 6000 people in the UK alone (EC[1]). In the city level, local air pollution has impacts on human health (e.g., respiratory diseases) and causes material damage to buildings and vegetation. Whilst it is recognized that there is a significant variation in the share of transport in total emissions across the Union (EC[1]), it is undoubted that the primary source of local air pollution of cities is the private car.

Noise from transport activities is an underestimated impact, both in quality of life and in health hazards. Road transport noise is the dominant source accounting for nine tenths of the proportion of the Union's population exposed to levels of noise over 65 dB(A) (EC[2]). Of course, the problem is aggravated in cities due to the topography of urban areas: often, in the city's landscape, high speed roads carry out significant traffic volumes through densely populated areas. Transport accidents represent another significant impact: In the Community every year about 50,000 individuals are killed in transport accidents, almost all in road traffic accidents (EC[1]). In the city's scale, fatalities concern pedestrians and cyclists who are the most vulnerable. Congestion represents great losses of time and money for commuters and the society as well. Moreover, it aggravates air pollution, bottlenecks economic and social activities and decreases mobility.

All these impacts are called «externalities», as they represent external costs of transport activities that commuters impose to the society. On average, the estimated social costs of road transport externalities in developed countries fall in the range of 2,5% to 3,2% of GDP. This is a conservative estimate: if congestion and consumption of land (e.g. roads, parking space, etc.) would also be included, the non-internalised social costs of transport might amount to approximately 5% of GDP in most countries(Himanen, Nijkamp, Padjen[13]). When referring to the city, these problems are caused in great level from the excessive car use. More over, it has contributed in the loss of the quality and of the social role and character of the road, as the city's social place. The car has superseded all other users of the road (pedestrians, cyclists), bottlenecks the circulation of public transport and causes problems of accessibility to an important part of the urban population.



2 Road Pricing and other policies to cope with the environmental problems

2.1 Policies to cope with urban transport problems

To cope with these problems, great emphasis is given by cities and the European Commission in the improvement of urban public transport. The Green Book «Citizen's Network» (E.C.[3]) refers to the improvement of urban public transport in Europe and examines the technological, institutional and functional changes necessary in this sector. Moreover, in the modern European city's landscape, cycling roads are also built, while pedestrianizations, in combination with urban rehabilitations attempt to encourage the pedestrian. However, the most ambitious measures taken are the ones that aim to reduce the citizen's car-dependence and to enhance a new life style: Road Pricing, Car Sharing, Car Pooling, Car Free Housing, are push and pull measures that aim towards behavioral changes.

2.2 The Road Pricing concept

Road Pricing refers to a new economic approach in the transport sector. According to it, the prices of every transport activity should reflect the true costs that this activity imposes in the environment and society. Moreover, it is recognized that the road transport sector is under-taxed. As long as road transport is treated concessively, it will remain the transport sector that carries out the biggest percentage of Europe's haulage and passenger transport. New forms of charging (electronic, per Km or per time spent in a specific area, transportation charge etc.) and modification of conventional taxation (vehicle ownership taxes, fuel taxes, circulation taxes) must be put in operation, in order that external costs of every transport activity are internalized in the transport market. The scope of the new approach is to reduce the role of the road transport sector, with the increase of the cost, provided that there will be other transport choices equally effective to it.

2.3 Urban Road Pricing

In the urban scale, the new approach is oriented towards the reduction of car traffic. Road Pricing is presented as a remedy to traffic problems and mainly congestion and is thought to be implemented in the form of urban tolls, covering congested urban areas. Also, the modification of



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conventional taxation should reflect the more severe impacts that car users activity has in urban areas. This is to be achieved by higher taxes (fuel taxes, car ownership taxes, car circulation taxes) imposed to the urban population, and especially dwellers of major conurbations, in comparison with the taxes that people living in rural areas will have to pay. However, the taxation policies do not entirely fit to the new Road Pricing rationale, which aims to give direct economic charges and signs to every transport user, according to the time and the route of his travel choices, through Urban Tolls.

There are three basic rationales behind urban tolls (Lauer[14]): Funding tolls, where charges are used for raising sums to finance transport infrastructure works (new roads) and policies (improvement of public transport). Secondly, regulatory tolls, which aim to discourage car users from circulating in particular times and places where there is congestion. In this case, the charge is set in the minimum required level to achieve the desired traffic conditions, and the collection of sums falls in lesser importance. Finally, orientation tolls which aim towards influencing behavior of commuters in a broader sense, not just concerning an isolated transportation choice, but more important choices, as the choice of a place to live, and generally of life patterns.

It has to be mentioned that Road Pricing policies concerning the city are not a totally new approach in urban transport policy. For example, parking policies are already in application in many cities. And in many cases, the lack of parking spaces, in combination with the high cost of renting a parking space represents a severe restriction for the urban citizen who wishes to move to a specific urban area (usually the central business district) driving his car. Thus, the charging of parking spaces is already an applied charging policy that fits more in the philosophy of regulatory tolls, and funding tolls as well. In some cities, more severe circulation restriction measures have been put in application: the entirely restricted zone (currently in Athens, etc.) is a severe measure which totally restricts the use of the car half the days of a week, according to the odd and even numbers of license plates (Vlastos[17], [18]).

3 The argumentation concerning Road Pricing

3.1 The pros and cons of Road Pricing

As expected, the representatives of the road transport sector strongly oppose to the implementation of Road Pricing. The truth is that the road

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transport sector supports in a great level the economy of the developed countries, as it carries out an important percentage of the Europe's haulage and represents a significant number of workers, employees, businesses (car manufacturers, tire industries, oil companies, car markets, service branch), and interests that are now being affected by pricing. According to these representatives, the road transport sector is already overtaxed, and the increase of costs in road transport will have negative side effects in the competitiveness of Europe's economy and industry, employment and development.

Moreover, it is counterproposed that the problems of the transport sector will be solved by new investments in road infrastructure and technological progress (Telematics, improvement of energy and environmental efficiency of vehicles etc.). Also, internalisation is treated with skepticism, as the impacts are only qualitatively defined and thus difficult to express in monetary terms.

Finally, all the related points of view concerning Road Pricing, as argued by various parties during conferences last years (European Commission ([1],[4]), «Alliance Internationale de Tourisme» and «Federation Internationale de l' Automobile» ([7]), Organisation Internationale des Constructeurs d' Automobiles ([8],[9]), Assosiation des Constructeurs Europeans d' Automobiles ([10],[11]), Freight Transport Association ([12]) and International Commission on Transport Economics ([15]) are codified in the next Table:

Table 1. The Pros and Cons of Road Pricing

AGAINST	FOR
1. The cost of congestion is internalised, because all people pay with the time loss they suffer[10],[11]	1. Congestion represents a major external cost as although all infrastructure users put together pay for the total time costs, there is still an externality and an ensuing wastage of scarce resources(urban space, energy,)[1]
2. Road Pricing is unfair, as the low revenues will not afford to pay for using the private car[7],[8],[11]	2. Road Pricing is fair, as people with higher incomes use more the car, and thus pricing will affect particularly them([4])
3. Road pricing will have negative impacts in the E.U. competitiveness, development,	3 Road Pricing will lead to an efficient transport system, with great benefits in Europe's



employment and economic and social growth ([8],[11])	competitiveness, economic and social growth ([4])
4. Road Pricing will not affect the modal split, as drivers will primarily divert to other routes or to other times of day([15])	4. Road Pricing will affect travel patterns and modal shift towards public transport modes [4]). Changing routes and timing is also a positive issue.
5. Congestion Pricing is unfair, because it penalises the user of a poor infrastructure which caused high congestion([11])	5. It is fair that the user should pay, so that the infrastructure becomes more efficient and improved([4])
6. Road transport taxation exceeds the monetary sum of external costs, which are overestimated ([9],[11])	6. Road Pricing aims towards a more differentiated charging system and not towards extra taxation of road transport([4])
7. Freight transport pricing will have negative effects in industry, especially the branches where transportation represents a great cost([12])	7. Road Pricing will result in rescheduling low value road haulage and shifting transport modes (train, etc.) with great financial gains for companies and industries([4])
8. Only roads can relieve pressure from roads. New and improved roads will help reduce congestion([7],[8])	8. New roads generate more traffic and represent a major environmental impact to the city and urban life([4])

3.2 Direct impacts in traffic patterns

More attention ought to be given in the issue of Road Pricing impacts in traffic patterns, which has already been a matter of the debate. It is argued that pricing will not affect drivers, who will simply switch to another route or travel another time of day. Also, there is a growing fear that Road Pricing will mainly affect the lower revenues. Firstly, the possible reactions of individuals in the new charges are difficult to predict, and we can only make speculations about future behavior. Also, reactions depend mainly on specific space and time characteristics, different in every travel and every city, on travel purpose, and especially on the time value of every individual. Thus, if time is short, people will pay the new charges and not shift mode, because it is undoubted that car riding represents great time savings in comparison with public transport, even in today's congested traffic conditions (ACEA[11]). These people

will be those who will gain from Road Pricing, especially business car travel drivers and drivers with higher incomes(Bayliss[16])

This is not a pessimistic approach, and it is not argued that Road Pricing will not affect travel patterns. It is just pointed out that nowadays travel choices are characterized by complexity and one can not use axioms to describe possible reactions to the new charges. Moreover, there is a theory that after a certain period of positive reaction (modal shift), the new charge is simply included in the cost of life by households and the effects of the new charges in behavioral patterns are whittled. The possibilities of new forms of social exclusions must be taken in account, as the new charges will strongly affect the low revenues. There are cases where there is not an efficient alternative to the car. In these cases, the extra charges will strongly impose to the poor. This is a great problem to cope with. The city is not a merchandise and all citizens have equal rights to it.

3.3 Indirect impacts in the city's structure

The evolution in transport technologies and the choices of transport policies have played a vital role in the urban sprawl that took place in the post war era in the developed countries. This can be briefed by the simplified thesis «the auto created the twentieth century city» (Marcuse[19]). Although this argument has been widely criticised (Marcuse[19]), the role of accessibility and transport offer in the choice of housing and the localisation of economic activities has been crucial. Consequently, possible effects of the implementation of Road Pricing in the city's structure must be taken into account.

Primarily, Road Pricing might have negative effects in economic activities and businesses that occupy them selves in marketing, maintenance and vehicle overhaul. Potentially, some of them will move away from the city center which will have limited accessibility to car users. Moreover, in a broader sense, long- standing implementation of Road Pricing might cause long-term non- reversible impacts in the city's structure, concerning the localisation of economic and commercial activities, the housing patterns, the social and cultural role of the city's center, etc. Possible long-term effects are thought to be the depopulation of areas surrounding major cities, the encouragement of higher density living (which is positive, because high density living facilitates the use of public transport) and the concentration of industrial activity close to population centers, due to higher transportation costs(ACEA[11]). Although this is presented as a disadvantage



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(ACEA[11]), we should point out that high density areas are better served by public transport. Of course, these are speculations that strongly depend on the preconditions, according to which Road Pricing will be implemented.

4 Proposal

4.1 Urban tolls: practical examples of Urban Road Pricing

There are some examples of current implementation of Road Pricing in urban areas, which have shown interesting results (E.C.[5]). In Bergen, a road pricing system is already in operation since 1986 in the form of cordon tolls, with primary targets the management of travel demand and the raising of funds for infrastructure financing and covering the costs of public transport. Moreover, the number of cars was reduced by 10% after the first year in operation. In Oslo, cordon tolls and road levies were put in operation in 1990, while 20% of the funds are reserved for the improvement of public transport and the rest to fund the construction of new roads. Similarly the implementation of Road Pricing resulted in a reduction of vehicles crossing the cordon by 5-10%.

In Trondheim, cordon tolls with differentiated tariffs (1991) resulted in a change of travel behavior of 42% of citizens as commuters changed to different modes or times of travel, while shoppers reacted most often by changes in time of travel, followed by adjustments in the destination and frequency of travel. Finally, Singapore is the well known city where an Area Licensing System (in combination with high taxes on car sales and car ownership) active since 1975 has resulted in substantial reduction of car traffic within the area, increased use of public transport, substantial reduction of emissions and time adjustments. It has to be pointed out that most of these systems use manual methods of enforcement, however the evolution of Road Pricing technology will soon activate Automatic Road Charging Systems(E.C.[6]).

4.2 Preconditions for the successful implementation of Road Pricing

Road Pricing and charging of car use is now a possible and realistic choice of transport policy, that deserves to be placed among the current policies that aim to improve the urban environment and the quality of life. However, the creation of an internal market in the scarce urban road space creates significant dangers for the city's future structure and social cohesion, that were pointed out and must be confronted. The city is a

social place, and this has been established through the centuries. Free movement through the city is a vital precondition for the liveliness, as well as the sustainability of the European city of the 21st century.

However, the city's social cohesion is nowadays threatened. The role of the road as the city's public space, a place of social contacts and communication is significantly reduced by the presence of the car. Thus, charging the car use might prove to be effective if it is used to impose a new equilibrium between the road users, car, pedestrians, public transport and cyclists. Under the precondition that pricing will not affect the social division: those affected by the new charges, must be compensated with effective alternatives based upon public transport modes. There are cases where private car is the only realistic modal choice for the middle class which will be seriously affected by the new charges. That for, the revenues from charges must remain strictly to the transport sector, not to fund new roads, but to finance new policies towards sustainable mobility: cycling, walking and public transport.

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