Economic impact of introducing road charging for Heavy Goods Vehicles

Summary Report

Final version

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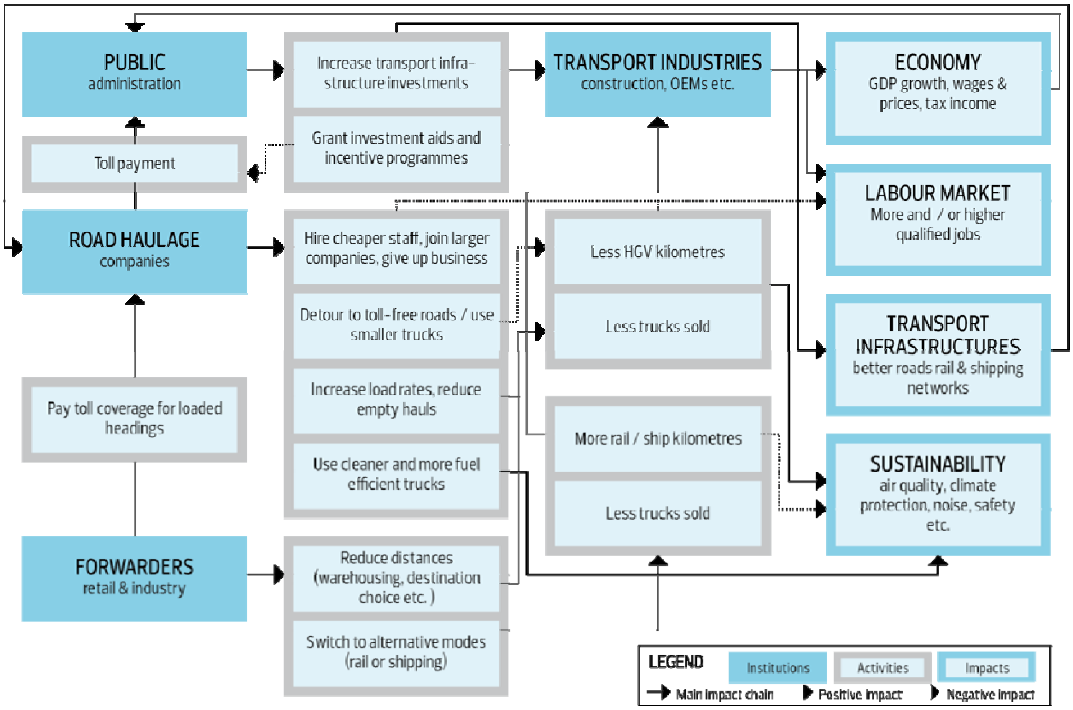
Purpose and approach of this report

This report presents the economic and environmental impacts of introducing or expanding road toll systems for heavy goods vehicles (HGVs) in some Spanish regions and their comparison with the impacts of the German toll system. The study was carried out by Fraunhofer ISI in collaboration with the Polytechnic University of Madrid on behalf of Transport & Environment (Brussels) between March and June 2016.

Investigated are potential efficiency gains, business impacts, regional competitiveness and labour market impacts, funding issues, and environmental sustainability. Many of these aspects and the institutions behind them interrelate, which results in a rather complex network of causal relationships as indicated by Figure S-1.

Figure S-1: Schematic illustration of causes and effects of introducing HGV road tolls



Source: Fraunhofer ISI / UPM

We investigate these impacts with a suite of tools: literature review, statistical data analysis, sector interviews, and the application of the ASTRA-EC system dynamics model for transport and economic evolutions.

Main findings

The following eight theses summarise the main findings and recommendations of the study. Where appropriate we provide specific information on the two study regions: Germany and Spain with reference to the provinces of Noreste and Southern Spain.

❶ **Transport efficiency in the road sector can be improved by increasing the cost pressure.** The efficiency of vehicle utilisation, the development of average transport distance and company structures differ widely across Europe, and so does the potential for further efficiency gains. Moreover, after invoicing a share of toll costs to their clients, the remaining cost burden of haulers remains small.

- Since 70% to 80% of tolls for loaded headings have been passed on to forwarders, the cost increase for German truckers is around 2% to 3%. Nevertheless, the introduction of the Lkw-Maut has contributed to further decrease the share of empty headings by 1% to 2%, and to stop the trend of growing average transport distance.
- With 47% of empty headings the overall efficiency of the Spanish trucking sector is far below the German share of 20%, suggesting room for efficiency gains. However, 91% of Spanish haulage companies consist of no more than five employees, indicating a high probability of consolidation among haulage companies when tolls are increased in level and / or geographical scope.

❷ **Transport volumes of rail and shipping grow with higher HGV tolls, but the respective decline in road volumes is marginal.** More expressed mode shift requires high quality and competitive alternatives to road as demonstrated in Switzerland and Austria.

- In Germany, market observations of the ministry for freight traffic diagnosed that mode shift targets of the Lkw-Maut were not met. Transport model applications confirm that an expansion of the Lkw-Maut to all roads would lift rail and shipping volumes by 5% at a 1% decline of road volumes.
- In Spain, the different track gauge to the rest of Europe make shifts to rail more complicated than for Germany. This is confirmed by stakeholder interviews and transport model applications. However, since the market share of the Spanish rail freight sector is currently very low, an extension of the road tolls could lead to a volume increase of up to 12% in some regions

❸ **Profit margins in the transport sector are affected, but to a minor extent only**. Most companies can pass on additional costs to their clients. Only the large number of small transport companies, which have a too weak market position to negotiate for suitable deals, cannot balance additional costs within a larger network.

- In Germany, profit margins are as low as 1% for small hauliers, and these most likely have to face a cost increase due to the Lkw-Maut. In contrast, profit margins reach 6% and more for the big players. For small hauliers toll costs are thus way more threatening than for large companies, who also have more options for logistics optimisation available.
- The commercial road haulage sector in Spain is highly atomised with 91% of companies having no more than five employees. These SMEs are generally in a weak position to pass on tolls and to negotiate higher freight rates.

❹ **Impacts on economic growth, employment and consumer prices are negligible.** Impacts on such indicators will vanish in the fluctuations and longer-term trends of global and

national markets. Changes in production costs and product prices estimated by economic models range well below 1%.

- For Germany, studies estimate a share of transport costs at production costs between 2% and 3%. Thus, an increase of toll costs that would lead to an increase of transport costs by 15% would only impact the overall product costs by 0.5% on average.
- Literature for Spain confirms that a rearrangement of prices takes place, but that this would only be noticeable in the first year of the introduction of tolls.

5 **Funds for road investment are determined by institutional settings and by earmarking rules**. In publically owned and governed systems like the German Lkw-Maut, the allocation of revenues to specific sectors largely depends on political decisions.

- The German Lkw-Maut more or less replaced the existing tax funding of the HGV share of motorway costs upon introduction in 2005. After an initial distribution of revenues to all modes, since 2011 revenues are earmarked to federal roads only. Although the Transport Infrastructure Financing Society in Germany formally uses all Lkw-Maut revenues for road investment, the funding system is not closed as cost share for cars and non-tolled federal roads are decided by the finance minister.
- This household-dependency ensures that the road funding system cannot go bankrupt. On the other hand, Spanish road operators remain more independent of state funding needs and political preferences, but they bear a higher risk because of the lack of flexibility of the contracts.

6 **Vignette solutions and tax regimes will cover only a fraction of infrastructure costs and will hardly incentivise a more sustainable purchase and use of vehicles.** As their average charge levels are low compared to distance based tolls for commercially used trucks, vignettes will thus only little contribute to logistics efficiency or to the reduction of externalities and congestion. On the other hand, these alternative funding sources are cheaper to implement and avoid economic burdens on small haulage companies..

- For a central country like Germany with rather high fuel taxes, distance based tolling is the better solution as this allow a fair charging of domestic as well as of foreign trucks using the national road infrastructure. With the high share of transit traffic, funding and acceptability is well manageable.
- Due to little transit traffic, which could be skimmed off, to long distances that Spanish hauliers have to travel to get to the European core markets, and due to the large number of small transport companies the Spanish logistics sector is rather sensitive to tolling. Alternative funding sources, including vignettes, thus deserve consideration. In any case, changes in tolling systems have to be well prepared through stakeholder participation processes and in-depth sector studies.

7 **Reliable road maintenance need closed funding cycles.** These are neither given in Germany nor in Spain. The Austrian system of an autonomous funding and road operation agency may be a good compromise between concession and state owned models.

- In Germany, which is among the richest economies in Europe, the quality indicators for the federal motorway and trunk road network are rapidly deteriorating, despite the Lkw-Maut tariffs having been calculated on the basis of funds required for closing the investment gap.
- The economic crisis caused a major budget shortfall in Spain for maintaining the road infrastructure which has been built over the last two decades. According to the Spanish Road Association, the road maintenance deficit in Spain accounts for €6.6 billion. Interview results for Spain state that less congestion and better pavement conditions for toll roads are expected if tolls are implemented. The concession contracts between the national and regional governments and the concessionaires guarantee for certain quality standards and are thus considered a pre-condition for an effective use of toll revenues..

8 **Intermodal infrastructure needs public funding**. One of the few public models for a large-scale, cross funding of rail infrastructure by road user charges is the Swiss heavy vehicle fee. Its success factor is the country's strong instrument of citizen participation, which cannot be easily transferred to other European countries. Other models like the intermodal, earmarking of the German Lkw-Maut and the planned Eco-Tax in France had to be resigned after strong protests from local policy and the trucking sector. The implementation of road toll systems for cross-funding thus has to be well prepared and communicated before fixing funding rules.

9 **HGV toll scenarios impact the external costs of freight transport, but the total effect remains rather limited**. Environmental benefits from road tolling arise from efficiency gains in trucking, from mode shift effects and from reduced HGV kilometres. All three effects remain moderate with current charge levels, and so do the economic external costs calculated for these impacts.. Depending on the incentive structure associated with the toll, total savings may range in the order of magnitude of 2% to 5% of total external costs in 2030.

- Resulting from demand growth, from lower emissions and from enhanced safety, average costs in Germany rise by 2% per tkm. In 2030, savings in external costs due to demand changes because of higher toll costs are €38.5 million or 0.5% as compared to a business as usual scenario. Way larger savings can be expected due to toll-driven technical and operational improvements in the road sector.
- Respective figures for Spain are €370 million (0.01%) for Noreste and €1.37 million (0.06%) for Southern Spain. Here, the potential efficiency gains are most likely much more expressed than in Germany.

Final remarks

We can summarise our findings as follows: road toll can be a significant source of government revenues that encourages users to a more rational mobility without having noticeable negative impacts on the logistics sector. As demonstrated in Germany, sustainability benefits can be built in through incentive structures e.g. by tariff differentiation.

The full version of this study contains an elaborated list of recommendations as well as full data and references to the statements made in this summary report.