FEDERATION INTERNATIONALE DE L'AUTOMOBILE
EUROPEAN BUREAU

POLICY POSITION ON INTERNALISATION OF EXTERNAL COSTS

MOBILITY

Executive Summary

While modern transport systems largely contribute to the high levels of economic and social welfare in our societies, they also generate downsides in terms of traffic casualties, climate change, air pollution, noise, and traffic congestion. At the same time, the transport system is often criticised to not fully cover the costs, it imposes on society. The background of such criticism is reflected in the (theoretical) concept of external costs.

In 2019, the European Commission has evaluated the external costs in transport. While this research has been comprehensive and thorough, it also showed the limitations of such an exercise. Data and calculations depend on the quality of the assumptions and are afflicted by significant uncertainties and approximations, which largely diminish the validity of many conclusions and hypothecate the appropriateness to allocate them to consumers.

Economic instruments to internalise external costs such as road charging have an uncertain impact on behaviour. They shift money, but do not create additional value. Given the strain on States' budgets, additional charges are unlikely to be spent to combat traffic externalities. In addition, the evaluation of the European Commission confirmed that a large share of the external costs, in particular accidents and noise, require alternative measures than taxes and charges, like command-and-control measures.

The FIA European Bureau supports the intelligent use of an appropriately balanced mix of command-and-control measures and alternative policies to diminish the negative effects of road transport rather than to charge for their occurrence.

Introduction

The transport system is often criticised to not fully cover the costs, it imposes on society. The background of such criticism can be found in the (theoretical) concept of external costs.

External costs of transport have evolved to a highly topical political discussion in the EU during the last couple of years. The most recent contribution to this discussion is a publication by the European Commission from 2019, which has evaluated the external costs of transport in the EU and its member states. The project is called "Sustainable Transport Infrastructure Charging and Internalisation of Transport Externalities" (STICITE) and consists of several deliverables in which not only external costs of transport are being calculated and presented, but also infrastructure costs and transport related taxes and charges. Furthermore, it contains a work on the state of play of internalisation of these external- and infrastructure costs.

While the research in STICITE has been comprehensive and thorough, it showed once more the limitations of such an exercise. As external costs cannot be found in balance sheets, quantifying them has to be done on the basis of assumptions and approximations. The results depend on the quality of the assumptions, approximations, available data inputs and calculations and are therefore associated with inherent uncertainty.

The dependency of the discussion on assumptions starts with the exact definition of external costs:

STICITE defines them as "costs that arise when the social or economic activities of one (group of) person(s) have an impact on another (group of) person(s) and when that impact is not fully accounted, or compensated for, by the first (group of) person(s)."[1]

This definition raises questions, on who actually has to bear the external costs. The individual perspective considers the external costs that are imposed on a person or a group of persons resulting from the transport activity of another person. The system perspective considers the whole transport system as a group. Consequently, only costs that are imposed on a person or another group of persons outside of this group can be considered as external costs.[2]

In order to analyse the methodological approach used by STICITE and review the assumptions made, the FIA European Bureau engaged a consortium consisting of Impact Assessment Institute (IAI), Element Energy (EE) and Cambridge Econometrics (CE) to compile an expert review. The review contained a sensitivity analysis of total external costs results as reported by STICITE, which takes account of identified uncertainties.

Therein total external costs of all transport modes in the amount of €987bn according to STICITE are found to be €335bn lower, when applying some changes in assumptions, resulting in total external costs of €652bn[3]. This revaluation is based on legitimate adaptions of assumptions, while it has to be

[1] European Commission (2019), Handbook on the external costs of transport, page 24
[2] IAI/EE/CE (2020), Review of the European Commission study "Sustainable Transport Infrastructure Charging and Internalisation of Transport Externalities" and the "Handbook on the external costs of transport version 2019", page16
[3] IAI/EE/CE (2020), page 8

noted that the value of statistical life (VSL) – a main driver of external costs – remained unchanged (see discussion of accident costs).

Of this amount, €448bn represents those external costs categories whose costs are mainly imposed on individuals outside the transport system.[4]

Furthermore, the changes in external cost values from the sensitivity analysis also influenced the cost coverage ratios. Same as in STICITE's results, the passenger car, in comparison to bus and coach, motorcycle, passenger train and aircraft, exhibits by far the highest overall cost coverage ratio, in which all transport related taxes and charges are compared to all infrastructure – and external costs.[5]

There are several concepts of how to internalise external costs of transport. From a theoretical economic point of view, marginal social cost pricing (MSCP) is considered as first-best approach, because the levy is set in such a way that social costs of an additional unit of transport equal the benefit of an additional unit of transport. Even though MSCP might be the best option in economic welfare theory, its fully accurate application exhibits significant challenges in practice. As marginal costs vary strongly according to time, place and type of vehicle as well as on the level of transport demand, its calculation is a very complex task.[6]

This is particularly true for those components where average costs do not equal marginal costs e.g. accident, congestion and noise costs. Since these three components account for 63%[7] of total external costs in the calculations of STICITE, the correct internalisation by increasing the costs for consumers is not feasible in real life for the majority of external costs.

IAI et al. (2020) also performed an analysis on the extent of MSCP for those cost components, where it can effectively contribute in practice to meeting the objectives of internalisation. External well-to-wheel climate costs and pollution costs are found to be fully internalised by fuel duties for a large majority of passenger cars that use gasoline or diesel fuel. Only older diesel cars (Euro 3 and older) are not covering their marginal costs completely. Nevertheless, for older diesels cars (Euro 2 & 3) fuel duties cover all marginal climate costs and 75% of marginal pollution costs.[8] Due to the fleet renewal and the more restrictive Euro-norms, the excess of fuel duties over the costs will further improve year by year.

The results of the sensitivity analysis and the high dependency on assumptions in the computation of external costs of transport clearly prove, that there is not only one truth in the concept of external costs. Therefore, this position statement is on the one hand a critical discussion of STICITE's evaluation of external costs and its different components. Furthermore, it points out recommendations of the FIA European Bureau, on how to reduce the negative external effects of transport.

[4] IAI/EE/CE (2020), page 8
[5] IAI/EE/CE (2020), page 89
[6] European Commission (2019), State of play of Internalisation in the European Transport Sector, page 30
[7] IAI/EE/CE (2020), pages 33, 40, 57
[8] IAI/EE/CE (2020), pages 94-95

Accident costs

Accident costs are the biggest cost component in the most current European Commission study on external costs of transport ("Sustainable Transport Infrastructure Charging and Internalisation of Transport Externalities" (STICITE)) and account for 29% of total external costs. Therefore, it is crucial to be aware of the uncertainty that lies in these costs.

According to the methodology used by STICITE, accident costs consist of five main components, which are human costs, medical costs, administrative costs, production losses and material damages. Human costs make up the biggest share of accident costs and are used for estimating the pain and suffering of accident victims by monetary means. Since no market price exists for human costs, different methodologies can be identified for their computation.

The method employed by STICITE uses the "Value of Statistical Life" (VSL), which is the effort to quantify the value of human life on the basis of, inter alia, willingness-to-pay studies. In such studies, individuals are asked how much they are willing to pay for a reduction of a mortality risk.[9] Another approach for determining human costs would be to deduce them from financial payments, awarded to accident victims by court decisions or by law.[10] These socially accepted compensation payments are significantly lower than the theoretically determined amounts of VSL. This implies a full internalisation of human costs derived from court decisions or by law. If the VSL approach is chosen, compensation payments made to accident victims by insurance companies have to be taken into account as internalisation of part of the human costs.
Another way to calculate human cost is to base them on public expenditures on improving road safety or insurance premiums for life insurance.[11]

Discussion of STICITE's position:

• In STICITE, human costs are determined by the VSL. Even though this is the most frequently used method, it is afflicted with significant uncertainty. Expressing a willingness to pay is one thing; actually having to pay is another. Even on the question of human life, it is necessary to be aware of the danger that hypothetical and actual willingness to pay differ. Furthermore, the used VSL of € 3.6m is the median value of a high range of reported values in the background studies. Even if top and bottom 10% were excluded, the values vary by a factor of 30, ranging from €0.45 m to €13.4 m.[12] The publication on the VSL quoted by STICITE recommends the application of values in the range between €1.8m and €5.4m.[13] Also STICITE itself acknowledges this inherent uncertainty when applying the concept of VSL.[14]

[9] IAI/EE/CE (2020), page 120
[10] IAI/EE/CE (2020), page 35
[11] European Commission (2019), Handbook on the external costs of transport, page 172
[12] IAI/EE/CE (2020), page 121
[13] European Commission (2019), Handbook on the external costs of transport, page 163
The values were adjusted from 2005 dollar to 2016 Euro
[14] European Commission (2019), Handbook on the external costs of transport, page 42

• A further assumption that involves uncertainty in STICITE's results is the use of multipliers to correct for underreporting of accidents. Thereby the number of serious injuries in road transport is increased by 25% (motorcycle: +55%) and the number of slight injuries is even doubled (motorcycle: + 230%).[15] Not only are the quoted studies relatively old (HEATCO (2006)[16] and Ecoplan (2002)), but furthermore it is assumed in Ecoplan (2002), that 90% of the non-registered accident victims can be assigned to the category of self-accidents.[17] Since accident costs of self-accidents cannot be considered as external costs, this finding would decrease total external costs substantially.

• In addition, the accident costs of at-fault drivers and drivers of self-accidents cannot be considered as external costs. A revauation of total external costs for road transport as presented in STICITE that considers these costs and compensation payments from liability insurance systems as internalised, results in a reduction of 44%[18] - even when applying a VSL as used by STICITE.

FIA European Bureau position:

• The value of life as socially accepted is enshrined in laws or court decisions and therefore, compensation for non-monetary costs is regulated by victim compensation rules. Since only the human costs of the non-causers of accidents can be considered as external costs and as they are fully internalised through compensation by insurance liabilities, no uncovered external accident costs remain. Insurance schemes also cover most of the monetary accident costs (third-party liability insurance, general health insurance). An adjustment of insurance premiums to the height of VSL would merely increase the financial burden for consumers without reducing the number of fatalities and injuries.

• The FIA European Bureau strictly opposes internalisation of accident costs by means of taxes and charges due to the following reasons:

- Research shows that the risk of an accident injury or fatality decreases with traffic density.[19] This implies that the impact of pricing on accident costs would be unpredictable, with no clear evidence whether pricing would lead to higher, lower or unchanged accident costs.
- The level of accident costs depends on a complete set of cost drivers (location, time of day, vehicle type, driving behaviour, etc.) for which it is hardly possible to cover them with a tax/charge instrument. A tax or charging system that does not consider these differences appropriately may result in sub-optimal decisions.
- Injuries and fatalities as a result of accidents also happen in other settings, e.g. in skiing. The consistent application of the pecuniary internalisation of accident costs would also mean to tax risk taking behaviour in general.

[15] European Commission (2019), Handbook on the external costs of transport, page 33
[16] HEATCO (2006), Developing Harmonised European Approaches for Transport Costing and Project Assessment (HEATCO), Deliverable D5: Proposal for harmonised guidelines
[17] Ecoplan (2002), Unfallkosten im Strassen- und Schienenverkehr der Schweiz 1998, page 21
[18] IAI/EE/CE (2020), page 6
[19] European Commission (2019), Handbook on the external costs of transport, page 40

- An application of the system perspective in the context of accident costs implies, users internalise the risk of an accident with the decision to participate in the transport system.[20] This reduces the external accident costs significantly and should be considered in a political discourse.

• Reduce the number of accidents in order to reduce accident costs through technology, investment and command-and-control measures:

- Road traffic casualties should be reduced through accident prevention and mitigation, further improving the active and passive vehicle safety, raise road user awareness for safe behaviour, build safer cars and improve infrastructure safety.
- No-claims bonus schemes should be promoted as to incentivising road users to avoid accidents.
- A multi-phase retraining system can be appropriately implemented, whereby novice drivers acquire higher order skills such as traffic insight, self-assessment, hazard perception, and risk awareness in order to validate their licence. Multi-phase schemes also offer additional time for instructors to address emerging issues, such as the appropriate use of advanced driver assistance systems, or the risks of distraction caused by nomadic devices such as smartphones.

• Further research needed:

- Since correction of underreporting significantly increases accident costs, and the available data is not sufficiently mature to reach robust conclusions further study is necessary to determine if there have been significant changes.
- While advanced driver assistance systems offer a huge potential to increase traffic safety, further research should be conducted on the effectivity of single systems and their interaction, as well as the framework of accompanying measures (awareness raising, information and education, training, etc) with view to reap the full benefits of their implementation.

Congestion costs

Congestion costs are the monetary evaluation of time losses due to a higher traffic density. In STICITE this cost category makes up 27% of total external costs. An exact description of the methodology in use is especially important, as a variety of definitions and methodologies of road congestion exist. This applies both to the question of which proportion of total time losses should be considered as external costs, as well as whom these costs are imposed on.

The individual perspective considers the external costs that are imposed on a person or a group of persons resulting from the transport activity of another person. The system perspective considers the transport system as a group. Consequently, there are no external costs imposed on another person or another group of persons outside of this group.[21]

[20] IAI/EE/CE (2020), page 34
[21] IAI/EE/CE (2020), pages 40-41

Discussion of STICITE's position:

• STICITE uses delay costs as congestion costs, when presenting total external cost figures and deadweight loss in the context of cost coverage ratios. Since delay costs evaluate all travel time lost relative to a free-flow situation also those costs that are borne by the same transport user who causes them are included.[22] Therefore, delay costs are not a proper measure for external costs as also acknowledged in the STICITE handbook.[23]

• There is furthermore a discrepancy in research between the determination of congestion costs on the road and other types of traffic. The European Commission's Handbook on external costs has not been able to provide a consistent set of reliable data on traffic congestion in other modes (e.g. passenger train).

FIA European Bureau position:

• The scientifically correct method of calculating road congestion costs employs the concept of deadweight loss. This is a standard economic tool to calculate welfare losses that considers the excess demand above the optimum from a welfare economic point of view.
An application of the deadweight loss method results in external congestion costs being reduced by approximately 83% percent in comparison to delay costs.[24]

• In contrast to most other cost categories, congestion costs are only imposed on each other within the group of traffic participants and not on the rest of society. It is a mutual hindrance between motorists with each motorist contributing the same level of congestion as he or she suffers through other motorists. A political discussion on road congestion costs has to take account of the fact that, when looking at the transport system as whole, there are no external costs at all. Since only traffic participants are affected by congestion costs, charging for congestion is equivalent to a triple counting: motorists stuck in traffic, having already paid their taxes and further suffering from a lack of investment.

• The FIA European Bureau strictly opposes internalisation of congestion costs by means of taxes and charges due to the following reasons:

- Internalising congestion costs by marginal social cost pricing has practical limitations as it requires idealised economic conditions of perfect competition, market stability, rational behaviour, and complete information[25]. Inevitably, congestion charges have to be based on simplified calculations as they depend on time, place and type as well as on the state of traffic flow. Simplifications may lead to suboptimal decisions from a welfare economic point of view.
- The introduction of congestion charges in an appropriate way may involve operational costs outweighing benefits.

[22] European Commission (2019), Handbook on the external costs of transport, page 89
[23] IAI/EE/CE (2020), page 30
[24] IAI/EE/CE (2020), page 41
[25] IAI/EE/CE (2020), page 24

- Limiting congestion charging to the main, primary network would divert traffic to secondary roads, potentially leading to a simple shift of congestion, increased harm in residential areas and higher traffic on less safe secondary roads.
- Moreover, citizens often do not have sufficient alternatives, in particular in rural areas, to go to work, bringing children to school or running errands.
- Considering the low elasticity of demand, charging for congestion risks to only increase the financial burden on consumers without solving the congestion problem.
- Congestion charging would in addition have a particularly adverse effect on low incomes.

• Due to these significant problems the internalisation by means of taxes and charges, the FIA European Bureau proposes the following measures for a reduction of congestion:

- Work times, for instance through flexible working hours or school holiday periods, should be spread out, while the use of digital work tools, the use of decentralised office space, and the possibility of homeworking should be encouraged.
- Territorial and transport development planning should be integrated, while mixed-use (housing, work, shopping, leisure) should be promoted.
- Investment in appropriate safe and efficient transport infrastructure to remove bottlenecks of the transport network should be reinforced.
- Appropriate and efficient public transport offers should be developed, walking and cycling, as well as multimodality should be promoted; traffic, parking management, and city logistics should be optimised.

• Further research needed:

- High uncertainties remain regarding the magnitude and interpretation of the external part of congestion costs. This requires further research.
- For a fair comparison of different transport modes, comprehensive research on congestion costs for other modes (e.g. passenger train) is needed.

Air pollution and climate change costs

Air pollution costs are an estimate of the costs of health affects, crop losses, material and building damages and biodiversity loss due to the emission of air pollutants. In STICITE air pollution costs account for 14% of total external costs. Tank-to-wheel climate change costs are the external costs of transport, associated with the effects of global warming. They are linked to the actual distance travelled, and account for 14% of total external costs. A further variation of air pollution and climate change costs are those costs that occur in the production of the relevant energy source. These so called well-to-tank costs account for further 5% of total external costs. A majority of up to 65% of well-to-tank costs is linked to the emission of greenhouse gases, and therefore to climate change costs. Due to this close connection, climate change costs and well-to-tank costs should ideally be considered together. This implies that total climate change costs account for 19% of total external costs.

Discussion of STICITE's position:

• Even though the general methodology, assumptions and input data used for the calculation of air pollution costs can be considered as robust and reliable, the valuation of health effects due to air pollution is afflicted with a material level of uncertainty. [26] This is, amongst other reasons, due to the use of a value of life years lost (VOLY), based on meta-analysis. Similar as in the derivation VSL, the background studies for this analysis report a high variation of values, from which the approximate median value of € 70.000 was chosen by STICITE. The high variation causes the VOLY to be subject to high uncertainty.[27] This fact is also recognised by the authors of STICITE.[28]

• The valuation of climate change costs is afflicted by a similar problem. The estimation of a price for one tonne of carbon dioxide equivalent (tCO_{2e}) is carried out on the basis of avoidance costs, a cost measure for the reduction of one additional tonne of CO_{2e}. The avoidance costs approach applied in STICITE complies with a CO_2 concentration in the atmosphere based on the targets of the Paris Agreement. Nevertheless, there is a significant spread of avoidance costs values per tCO_{2e} for 2025 in the used input literature, ranging from ca. 50 to 150 €/tCO_{2e}. This again is a source of uncertainty.[29]

FIA European Bureau position:

• Despite the findings that the results are afflicted with significant uncertainty, the FIA European Bureau strictly opposes further taxation and charging to tackle air pollution and climate change costs, because:

- Existing fuel duties already cover external costs from pollution and climate emissions for Euro 4 passenger cars, including well-to-tank emissions. Due to recent improvements of emission standards and real-driving emissions of passenger cars, the gradual modernisation of the vehicle fleet will further increase the cost coverage and effectively reduce pollution emissions.
- Consumers are not always willing to invest in fuel-reducing technologies, even if these investments are quickly amortised by lower fuel costs. Several reasons for this consumer behaviour exist, e.g. consumer myopia, imperfect information and split incentives. Fuel-efficiency standards or improved information for consumers are better instruments for solving this "energy paradox" than a cost increase.[30]

• Air pollution – and climate change costs are to be tackled through technology, investment and command-and-control measures, which is already the case:

- The EU has set CO_2 targets that require new passenger cars to emit no more than 95gCO_2/km in 2021 (average over all cars sold). Further target reductions of 15% in 2025 and 37.5% in

[26] IAI/EE/CE (2020), pages 49-50
[27] IAI/EE/CE (2020), page 121
[28] European Commission (2019), Handbook on the external costs of transport, page 61
[29] IAI/EE/CE (2020), page 52
[30] European Commission (2019), State of play of Internalisation in the European Transport Sector, page 40

2030 the CO_2 emissions of passenger cars will decrease the climate change costs of passenger cars continuously.[31]

- The Euro 6d light duty vehicle standard, a regulation of pollutant emissions which sets lower limits as from 2020 is intended to reduce real on-road emissions significantly. Therefore, this new standard, along with a fleet turnover, will gradually reduce pollution costs of passenger vehicles towards zero.[32]

• The FIA European Bureau furthermore proposes the following measures to reduce air pollution and climate change effects:

- The European Commission should develop a methodology for assessing the life cycle emissions of vehicles for the purpose of monitoring CO_2 emission reductions between 2025 and 2030, while ensuring a technology neutral approach to decarbonisation, and support measures to decarbonise all power trains including the use of low carbon liquid fuels in vehicles.
- The European Commission should further support the deployment of alternative fuels through legislation, where they are truly sustainable and can offer significant emissions reductions, together with the deployment of charging and refuelling infrastructure.
- The European energy taxation framework should remain the main financial tool to incentive motorists to save fuel.
- Demonstration programmes, as promoted by the FIA European Bureau, should increase the awareness of available alternatives.
- The European Commission should fully evaluate the potential of stricter post Euro 6 limits to cut air pollutant emissions as well as more ambitious greenhouse gas emission targets that are technologically viable and do not have a significant effect on the cost of motoring.
- The European Commission should enhance the market surveillance, as proposed in the revision of the type approval legislation.

• Further research needed:

- In view of the remaining high uncertainties regarding the source and the impact of air pollutants on human health, further research is necessary, also in view of the revision of the European air quality legislation and the related air quality targets.

Noise costs

External noise costs are a pecuniary estimation of health effects as a consequence of traffic noise exposure. STICITE captures ischaemic heart disease, stroke, dementia, hypertension and annoyance and assigns a relatively small share of 7% of total external costs to this component.

[31] IAI/EE/CE (2020), page 75
[32] IAI/EE/CE (2020), page 75

Discussion of STICITE's position:

• Input data used to determine the number of people exposed to road noise is based on the European Environment Agency (EEA) Noise Map. The low resolution of this map implies uncertainty on the results, even though a sensible method has been used to correct for the low resolution. [33]

• The annoyance costs valuation is based on extensive meta-analysis, where the underlying sources exhibit a wide range of values. This introduces a further degree of uncertainty which should be considered when viewing the results.[34]

FIA European Bureau position:

• Despite the findings that the results are afflicted with significant uncertainty, the FIA European Bureau points out the following efficiency problems of noise taxes and charges:

- Marginal noise costs are strongly context-specific and differ from average costs. They are partially correlated with traffic volume. Similar to accident and congestion costs, it would very likely be difficult to devise marginal social cost pricing systems that would efficiently reduce and internalise the costs.[35]
- Differentiation of pricing would accurately have to take into account the noise levels of individual vehicles, user behaviour, timing of driving and spatial / proximity parameters. This could be approximated, but the complex set of influencing factors makes accurate marginal social cost pricing difficult in practice, resulting in quasi-average pricing.[36]
- It can therefore be concluded that there are significant barriers to achieving the objectives of internalisation of total external noise costs through pricing due to their highly situation-dependent nature.

• The FIA European Bureau points out that other measures, including regulation on vehicles and driver behaviour, to achieve the objective of lower external noise costs, are already in force:

- Noise levels of new vehicles are controlled by EU regulation since 2016[37] in which a 4dB reduction for all new passenger cars from 2026 compared to 2016, and a 3dB reduction for larger vehicles and commercial vehicles was determined.[38]
- Exhaust systems of motorcycles must be constructed in a way that does not easily permit removal of baffles that prevent excessive noise under acceleration, according to international regulation (UNECE Regulation 41) adopted by the EU.

• Furthermore, the FIA European Bureau proposes the following measures to reduce traffic noise:

- Structural measures (quiet surfacing, noise barriers), as well as traffic management measures, enhancing traffic flow, should be taken to reduce traffic related noise.
- Further improvement with regard to vehicle-related noise should be sought.

[33] IAI/EE/CE (2020), page 58
[34] IAI/EE/CE (2020), page 58
[35] IAI/EE/CE (2020), page 59
[36] IAI/EE/CE (2020), page 59
[37] Regulation (EU) 540/2014
[38] IAI/EE/CE (2020), page 75

Habitat costs

Habitat costs are a rather low-cost component, accounting for 4% of total external costs in STICITE. They are an effort to estimate habitat damage, occurring as a consequence of transport and include habitat loss, habitat fragmentation and habitat degradation due to emissions.[39] Habitat costs differ from other costs components due to their methodical characterisation as fixed costs, which arise with the construction of infrastructure and are therefore independent of actual transport performance.

Discussion of STICITE's position:

• The estimated costs are derived from a single source, which is a study on habitat costs in Switzerland. The cost factors for habitat loss and habitat fragmentation of this study are applied to the whole EU transport infrastructure. Such a scaling up to European level raises questions about the validity of the results, since it does not account for country-specific and local characteristics[40] and it seems doubtful whether Swiss habitat costs are representable for the rest of the EU.

• STICITE ignores deeper issues such as the value of alternative habitat structure created due to the compartmentalisation by transport infrastructure, and misses to present details on how costs have been allocated to vehicle categories.[41]

• Furthermore, STICITE is missing a robustness - review on habitat costs, which is carried out for the other cost components though. This increases the uncertainty even more and in addition to the other concerns leads to the conclusion, that the results cannot be considered as robust.[42]

FIA European Bureau position:

• In addition to the finding, that STICITE's results on habitat costs cannot be considered as robust, the FIA European Bureau points out the difficulties of internalising habitat costs with instruments of taxes and charges:

- In contrast to other external cost categories, habitat costs are fixed costs that already arose with the construction of infrastructure. Therefore, the marginal costs are zero and taxes and charges would not influence transport behaviour in a way that would reduce external habitat costs.
- The construction of infrastructure is usually decided on behalf of elected representatives, who are assumed to have the public interest in mind, when deciding on public infrastructure projects.
- Furthermore, the construction of infrastructure also has to be realized in compliance with legal requirements, ensuring that negative impacts on environment and habitats are accounted for.
- Further research is needed to account for the local differences and characteristics, when estimating the habitat costs of road transport infrastructure.

[39] European Commission (2019), Handbook on the external costs of transport, page 117
[40] IAI/EE/CE (2020), page 60
[41] IAI/EE/CE (2020), page 60
[42] IAI/EE/CE (2020), page 60

Subsidies

A comprehensive comparison of costs incurred on society by different transport modes should also include subsidies and cost of government support, which are "a result of government actions that confers an advantage on consumers or producers, in order to supplement their income or lower their costs", according to OECD (2005)[43]. While STICITE takes into account subsidies on infrastructure costs as well as tax rebates and deductions, it misses to include other subsidies to incentivise the purchase of vehicles or to support transport operations. These costs could be considered as additional costs that society (through governments) actually pays for the transport system. Research of IAI et al. (2020) proves that neither comprehensive statistics on purchase incentives of vehicles nor on subsidies to support transport operations are available on European level. Therefore, IAI et al. (2020) conducted an estimation and found that subsidies for electric vehicles in 2016, were likely to be less than €1bn in total. A conservative estimation of subsidies to support rail operations resulted in a figure of €30bn, in which operating losses, debt alleviation, public subsidies and concessionary fares were incorporated. This estimation only partially includes figures for urban public transport.[44]

Discussion of STICITE's position:

- STICITE does not contain figures on transport subsidies and states poor data availability and variety of different subsidy schemes as reasons.[45] Even if this applies, subsidies represent effective payments, borne by tax payers, and must not be ignored in a fair comparison of different modes. IAI et al. (2020) prove that data for an estimation of subsidies is available. The allocation of €30bn to the different transport modes leads to major changes in cost coverage ratios. This especially applies for the cost coverages of passenger trains. Starting from an already low level the overall cost coverage ratio for electric passenger trains decreases to 15%, the one for diesel passenger trains to 18%.[46].

FIA European Bureau position:

- A comparison of costs that arise for society due to different transport modes should also include effective payments like subsidies, as they represent additional costs borne by society.
- IAI et al (2020) show that transport subsidies are granted on a large scale in the EU. Further research on payments like these should therefore be conducted.

[43] OECD (2005), Environmentally Harmful Subsidies, page 16
[44] IAI/EE/CE (2020), pages 69-70
[45] European Commission (2019), Transport taxes and charges in Europe, page 21
[46] IAI/EE/CE (2020), page 89

Conclusion

As external costs cannot be found in a balance sheet, quantifying costs on the basis of assumptions, runs the risk of being at best imprecise, at worst unrealistic. Errors in their assessment and in their internalisation can cause higher economic harm than the actual externality. Externalities are often considered individually, instead of in conjunction with one another, leading to exaggerated cost estimations.

It is therefore questionable to apply an economic concept based on uncertain assumptions. The internalisation of external costs can thus lead to the setting of 'political' prices under the guise of economic theory. This is not a desirable solution. Due to the uncertainties that arise from the methodology and assumptions, studies on external costs should primarily be used to make directional policy decisions, e.g. on the question of setting limits, to prepare or to subsequently evaluate their effectiveness.

The main categories of external costs including accidents and congestion are to be tackled through technology, investment and command and control measures, rather than pecuniary instruments. In particular with regard to congestion costs, welfare gains to be obtained through an internalisation of external costs are in most cases smaller than the external costs, as their internalisation induces abatement costs.

Furthermore, significant reductions in external costs are expected in the next ten years thanks to the deployment of new engine and safety technology as well as traffic management systems, including intelligent transport systems and cooperative, connected automated driving.

Command-and-control measures

In its State of play of Internalisation in the European Transport Sector, the European Commission acknowledges that command-and-control measures are suitable tools to reduce externalities in addition to or instead of taxes and charges, outlining the following reasons:

- As transport taxes and charges are under member States' competence, the international downsides of transport (e.g. climate change, air pollution) have to be tackled on European level, by selecting command-and-control measures.
- To avoid distortions of the internal market, as transport taxes and charges differ widely between EU Member States.
- To provide a broad level playing field for the investment in new technologies reducing external costs and long-term certainty for investors in these technologies.
- To incentivise vehicle owners to invest in fuel-reducing and safety technologies, despite consumer myopia, imperfect information and split incentives.
- To overcome imperfect information of consumers, instruments like labelling are favourable.
- To address externalities that are not targeted by taxes and charges such as accident costs.
- To circumvent the lack of social and political support for taxes and charges.

Impact of future regulations and technology

In all transport modes, existing and foreseeable regulation is expected to drive significant reduction in external costs of transport by 2030, with the possibility of heading towards zero by 2050.[47] Road transport is expected to be characterised by electrification and cooperative connected and automated vehicles, reducing the external costs of pollution, climate, noise and accidents in particular.

For 2050, continued reductions in air pollution towards zero are expected. Climate emissions should also head towards zero, if the EU's ambition of net zero emissions in 2050 is to be realised, which will heavily depend on decarbonisation of the energy sector. If the current expectations for artificial intelligence and its application to road vehicles are realised in order to meet the EU's "Vision Zero" goal, the human factor in road accidents could be negligible by then, reducing accident costs towards zero.

FIA European Bureau research

The FIA European Bureau engages in European research and innovation programmes to support and promote the development and the deployment of safe, clean, energy efficient mobility, such as:

The ELVITEN project which focuses on demonstrating the benefits of light electric vehicles (such as e-bikes and scooters);

The Green Vehicle Index (GVI) project which promotes the development of vehicles that are clean, energy efficient and environmentally friendly.

The MODALES project which encourages the adoption of driving behaviour and vehicle maintenance that can help lower emissions.

For more information, see the FIA Region I website.

[47] IAI/EE/CE (2020), page 74

Fédération Internationale de l'Automobile (FIA) European Bureau

The FIA European Bureau, based in Brussels, is a consumer body comprising 67 Mobility Clubs that represent over 36 million members from across Europe, the Middle East and Africa. The FIA represents the interests of our members as motorists, riders, pedestrians and passengers. We work to ensure safe, affordable, clean and efficient mobility for all. Learn more at www.fiaregion1.com