

Euro study says motorcycles are the worst form of transportation, socially speaking

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Jul 15, 2019 - <https://www.revzilla.com/common-tread/euro-study-says-motorcycles-are-the-worst-form-of-transportation-socially-speaking?>

165 Comments

Last month, the European Commission (the executive branch of the European Union) released a report on the real costs to society of every common mode of transportation — and concluded that motorcycles are the most anti-social form of transport.

The publication, prepared by [CE Delft](#), carries the unwieldy title, "[Sustainable Transport Infrastructure Charging and Internalisation of Transport Externalities](#)." It attempts to quantify the total costs of different modes of transport by looking not only at the costs borne by the users of each mode of transportation (such as the cost of vehicles, fuel, taxes, and tolls), but also at the costs borne by society as a whole.

The object of this study is to provide data that the EC can use to set tolls and taxes. It would be bad enough for European bikers if those increased, but some who've read the report fear that it may pave the way for an outright ban.

Estimating costs

If I remember Econ 201, an "externality" is a cost (or benefit) that affects a party who didn't choose to incur it.

Say you buy a plane ticket to Hawaii. You pay an airline, which uses your money to cover your share of fuel, crew and staff salaries, gate fees at the airport, depreciation on a Boeing, etc. When the flight attendant comes by to offer a "free" coffee, you don't feel guilty accepting it, because indirectly but fairly, you paid for it.

You may not realize that your trip also results in an externality: tons of carbon pollution (yes, tons, plural, per passenger!). That contributes to global warming, exacerbating future storms and flooding that will do billions of dollars in damage. When you bought your ticket, you didn't cover your share of those costs; you would have had to pay double, or more, to internalize those costs.

The EC study looked at infrastructure costs, as well as other social and environmental costs, for all common modes of powered transport:

- Passenger car
- Bus
- Coach (inter-city)
- Motorcycle
- High-speed train
- Electric passenger train
- Diesel passenger train
- Aircraft

Infrastructure costs are easily quantified. In the case of road transportation, they include the cost of building and maintaining roads.

| Vehicle category | Total infrastructure costs | Average infrastructure costs | Marginal infrastructure costs |
|--------------------------------------|----------------------------|------------------------------|-------------------------------|
| Passenger transport modes | Billion € | €-cent/pkm | €-cent/pkm |
| Passenger car | 98 | 2.1 | 0.1 |
| Bus | 8 | 4.0 | 1.9 |
| Coach | 13 | 3.7 | 1.8 |
| Motorcycle | 3 | 1.8 | 0.1 |
| High speed train (HST) | 12 | 10.6 | 0.8 |
| Electric passenger train (incl. HST) | 51 | 13.4 | 1.6 |
| Diesel passenger train | 18 | 27.0 | 3.5 |
| Aircraft ^a | 14 | 1.6 | 0.5 |

Infrastructure costs. Table from study.

Motorcycles fare well by this measure. Because they're small and light, motorcycle traffic doesn't force governments to build new roads or parking lots, and motorcycles barely cause any wear and tear to existing pavement. So motorcycles were assigned an infrastructure cost of €3 billion, compared to €98 billion for automobiles and €42 billion for heavy trucks. However, motorcycles' infrastructure cost per passenger-kilometer is barely lower than automobiles' (€0.018/pkm for motorcycles vs. €0.021/pkm for cars). This smaller difference reflects the fact that cars are more likely to carry more than one passenger.

Anyway, at least as far as infrastructure costs go, the bureaucrats agree with something that seems obvious to anyone who rides a motorcycle: We have a smaller footprint, especially on the urban landscape.

The problem comes with the external costs.

The European Commission identified nearly €1 trillion in external costs associated with transportation activities across the European Union's 28 member nations in the sample year (2016). That's a staggering trillion Euros in social costs that aren't borne by vehicle users, but rather by society as a whole, both now and in the future.

| Vehicle category | Total external costs | Average external costs |
|---------------------------|----------------------|------------------------|
| Passenger transport modes | Billion € | €-cent/pkm |
| Passenger car | 565 | 12.0 |
| Bus/coach | 19 | 3.6 |
| Motorcycle | 41 | 24.5 |
| High speed train | 1 | 1.3 |
| Electric passenger train | 11 | 2.6 |
| Diesel passenger train | | 3.9 |
| Aircraft | 48 ^a | 3.4 |

External costs. Table from study.

Passenger cars account for more than half the total externalities, €565 billion, while motorcycles account for just €41 billion. So far, so good, but when you look at external costs per passenger-kilometer, motorcycles come out looking very bad.

The social cost of riding a motorcycle is double the social cost of traveling by automobile (€0.245/pkm for a motorcycle versus €0.12/pkm for autos). The social cost of riding a motorcycle is nearly 10 times the social cost of traveling by high-speed train, which is the most efficient transport mode.

Yikes! Twice as bad as cars, and 10 times as bad trains. What gives?

That trillion Euros includes environmental costs (both climate change and air pollution), accident costs, and congestion costs for road transport. Motorcycles have obvious strengths and weaknesses vis-à-vis such costs, so let's dive in.

Environmental costs

Environmental costs account for 44 percent of the total external costs of transportation — the biggest single category — and consist primarily of:

- Climate change
- Air pollution
- Noise

Motorcycles fare pretty well when it comes to climate change, which makes sense because carbon emissions are basically a straight function of fuel consumption. Motorcycles create an external cost of a little under €0.01 per passenger-kilometer. Cars come out a little bit higher (they'd be quite a lot higher, but they're far more likely to carry more than one passenger).

| Transport mode | Total costs EU28 Billion € | Average costs | |
|----------------------------------|-------------------------------|---------------|------------|
| | | €-cent/pkm | €-cent/vkm |
| Passenger transport | | | |
| Passenger car | 33.36 | 0.71 | 1.14 |
| <i>Passenger car - petrol</i> | 8.58 | 0.33 | 0.53 |
| <i>Passenger car - diesel</i> | 24.79 | 1.18 | 1.90 |
| Motorcycle | 1.84 | 1.12 | 1.17 |
| Bus | 1.35 | 0.76 | 14.19 |
| Coach | 2.67 | 0.73 | 14.34 |
| Total passenger road | 39.23 | | |
| High speed passenger train | 0.002 | 0.002 | 0.66 |
| Passenger train electric | 0.03* | 0.01 | 1.14 |
| Passenger train diesel | 0.52 | 0.80 | 47.0 |
| Total passenger rail | 0.55 | | |
| Total passenger transport | 39.78 | | |

Air pollution costs. Table from study.

We don't do as well when it comes to other forms of air pollution, but it could be worse. Gasoline-powered autos pollute somewhat less per kilometer traveled, and diesel cars pollute a little more.

According to the World Health Organization, noise costs society by increasing heart disease, strokes, hypertension, and dementia. I suppose this means that noise is literally driving us crazy, as well as creating a simple annoyance.

| Transport mode | Total costs EU28 Billion € | Average costs | |
|-------------------------------|-------------------------------|----------------|----------------|
| | | €-cent per pkm | €-cent per vkm |
| Passenger transport | | | |
| Passenger car | 26.2 | 0.6 | 0.9 |
| <i>Passenger car - petrol</i> | 13.8 | 0.5 | 0.8 |
| <i>Passenger car - diesel</i> | 12.4 | 0.6 | 0.9 |
| Motorcycle | 14.8 | 9.0 | 9.4 |
| Bus | 0.8 | 0.4 | 8.0 |
| Coach | 0.9 | 0.2 | 4.7 |
| Total passenger road | 42.6 | | |

Noise costs. Table from study.

You might guess that motorcycles are rated particularly anti-social when it comes to noise. According to this study, motorcycle noise costs society €0.09 per passenger-kilometer. That's more than 10 times the figure for autos — although in absolute terms cars still cost society more, because there are so many of them.

Overall, though, it's not environmental costs that make us out to be a bunch of maniacs.

| Transport mode | Total costs EU28 | Average costs | |
|----------------------------------|------------------|----------------|----------------|
| | | €-cent per pkm | €-cent per vkm |
| Passenger transport | Billion € | | |
| Passenger car | 210.2 | 4.5 | 7.2 |
| Motorcycle ¹³ | 21.0 | 12.7 | 13.3 |
| Bus/Coach | 5.3 | 1.0 | 18.9 |
| Total passenger road | 236.5 | | |
| High speed passenger train | 0.1 | 0.1 | 17.3 |
| Conventional passenger train | 2.0* | 0.5 | 52.2 |
| Total passenger rail | 2.0 | | |
| Total passenger transport | 238.5 | | |

Accident costs. Table from study.

Accident costs

Since every European Union country has socialized medicine, it's clear that the cost of traffic accidents is borne by society, not by individual drivers or riders. In absolute terms, cars are responsible for 10 times the accident costs of motorcycles, €210 billion for cars versus €21 billion for bikes. But, on a passenger-kilometer basis, bikes incur triple the accident costs of cars (€0.127 for motorcycles versus €0.045 for cars). The fact that European motorcyclists' accident costs are "only" four times car drivers' costs presumably reflects the fact that riding a motorcycle in Europe is, relatively speaking, safer than riding a motorcycle in the United States.

Are motorcycles really the worst mode of passenger transport?

Perhaps not overall. Virtually all of the external costs of motorcycle use are concentrated in two categories: noise, and accident costs.

As for noise complaints, I bet that 80 percent of the total annoyance is caused by the most insecure and exhibitionist 20 percent of riders. If we could get them to go back to stock pipes — or, better yet, give up motorcycles — we'd score better.

The Federation of European Motorcyclists' Associations is a non-governmental organization that represents motorcyclists' interests and lobbies the EU and other European governments. FEMA [has already published a rebuttal](#) to the high accident cost figure. The organization's General Secretary, Dolf Willigers, was quick to point out that more than half of European motorcycle crashes are caused by other drivers, but the costs associated with those accidents appear to have been "charged" to motorcycles for the purposes of the study.

Motorcycles should get a credit for reducing congestion

Virtually all European riders lane-split. They call it "filtering" over there, and in many countries, you must demonstrate filtering proficiency to qualify for a motorcycle endorsement. Because motorcycles are hardly affected by traffic congestion and don't really contribute to it, they're not even mentioned in the part of the report that compiles the €270 billion external cost of congestion, such as lost productivity and increased exposure to pollutants.

| Vehicle category | Delay costs | | | Deadweight loss costs | | |
|------------------------------------|---------------------------|----------------|------------|---------------------------|----------------|------------|
| | Total EU28 [Billion €] | €-cent/ pkm | €-cent/vkm | Total EU28 [Billion €] | €-cent/ pkm | €-cent/vkm |
| Passenger transport | | | | | | |
| Passenger car | 206.2 | 4.37 | 7.03 | 35.6 | 0.75 | 1.21 |
| <i>Passenger car - urban</i> | 172.6 | 11.82 | 19.03 | 30.0 | 2.06 | 3.31 |
| <i>Passenger car - inter-urban</i> | 33.6 | 1.03 | 1.66 | 5.5 | 0.17 | 0.27 |
| Coach <i>inter-urban</i> * | 2.1 | 0.74 | 14.49 | 0.2 | 0.08 | 1.50 |
| Total passenger | 208.3 | | | 35.8 | | |

Congestion costs. Table from study.

The thing is, motorcycles should actually get a credit for reducing congestion. Studies have shown that even a small percentage of motorcycles in the traffic mix has the effect of removing cars from the traffic column and can significantly speed the total traffic flow.

One of the things we've done a terrible job of communicating to car drivers is that when we filter past cars in heavy traffic, everyone gets where they're going faster. And since two or three 'cycles can park in the same amount of space as one car, we reduce parking congestion, too.

A future without motorcycles?

FEMA has additional criticism of the EC study's methodology, but it's clear that most road traffic really does impose a significant external cost to society. Those externalities are certainly greater in the United States, where the fleet burns more fuel, rates of accidental injury and death are higher, and the cost of accident treatment is astronomical.

The nominal purpose of this study was to give EU officials data they can use to improve the fairness of tolls and taxes, in order to internalize those external costs — to make motorcyclists, in this case, cover the whole societal cost of motorcycle use.

Some commenters have already expressed the fear that this study will be used to justify outright motorcycle bans. Various European jurisdictions have already instituted partial bans, and this study provides them with more ammunition. Even if the study is only used to adjust tolls and taxes, if governments actually collected €0.245 per kilometer from European riders, it would amount to an economic ban.

It's interesting to note that the external cost of riding EV motorcycles would drop below the external cost of operating a current automobile. (Though of course, by the time there are enough electric motorcycles to affect overall numbers, there will also be far more electric cars, and their external cost will drop, too.)

My final argument against the conclusion of this study

The European Commission has failed to take into account the fact that riding motorcycles is fun. Motorcycles may well be associated with a big external cost borne by society, but we should also get credit for a happiness dividend. Most of the time, when you finally get where you're going by car, you're stressed and angry; when you get where you're going by motorcycle, you're happy.

That's gotta be worth something.