



Dear reader,

Congestion charging has been around for quite a while, since [Singapore](#) first introduced it in 1975. In the EU congestion is often located in and around urban areas and costs nearly 100 billion Euro, annually. The World Health Organization estimates 1.3 million deaths each year globally are related to air pollution, which to a large degree is caused by emissions from road traffic. Yet congestion charging did not boom the way bike sharing and car sharing did. However, in recent years there seems to be a [revived interest](#) in this much debated pricing scheme.

Have existing schemes proven to be successful? What are the barriers to introduce congestion charging? How can we increase public acceptance? Discover the answers in this e-update!

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Congestion charging in Europe



A congestion charge is a charge for driving a vehicle in an urban area, often limited to working hours. It belongs to the category of road pricing measures, which also includes tolls, distance- or time-based fees and charges for polluting vehicles. Road pricing is typically implemented as a way of paying back the cost of a debt financed road, but congestion charging aims to influence traffic demand and to discourage the use of congested roads at congested times.

Several cities have looked into the option of congestion charging (for some examples see [this list](#)), and several studies suggest that a congestion charge would be beneficial, for instance for Graz and Vienna in Austria ([VCÖ fact sheet](#)), and for Helsinki in Finland (studies in [2009](#) and [2011](#)).

However, only a few European cities have actually implemented it:

- Durham, UK: Small-scale congestion charge (2002)
- London, UK: The Congestion Charge (2003)
- Stockholm, Sweden: The Congestion Tax (2006)
- Valletta, Malta (2007)
- Milan, Italy: Area C (2012) evolved from the pollution tax scheme Ecopass (2008)
- Gothenburg, Sweden (2013; continuation rejected in September 2014)
- In Norway, there is no real congestion charging, however, some road tolling schemes in cities have similarities to congestion charging

Different designs, different objectives



The former pay booth at exit for the congestion charge in Durham. The system now uses Automatic number plate recognition.

The main rationale behind congestion charging is the **internalisation of external costs**. The British Department for Transport estimates that almost half of the kilometres driven in the UK have marginal external costs under 5 pence, while driving in the most congested areas of the UK is associated with extremely high marginal external costs of almost £2.50 per kilometre. General fuel and vehicle taxes fail to address these externalities (Institute for Fiscal Studies: **Fuel for Thought**).

There is a wide range of **scheme design options** that allow congestion charging to serve a wide range of other policy aims as well. We will now take a closer look at the most frequently cited policy aims and the results that existing charging schemes have yielded in these fields.

Reducing congestion and optimising the transport system



Entrance of the Congestion Charge zone in London. Photo by [Mariordo / CC BY-SA 3.0](#)

In many European cities, congestion leads to wasted time and subsequent economic costs (see the **TomTom Traffic Index Europe 2013 annual report**). In London, the efficient operation of the transport system was the main aim of the Congestion Charge: reduced congestion, improved bus services, improved journey time reliability for car drivers and more efficient city logistics.

European charging schemes have had the following impacts:

- Decrease of congestion: 30% in London (**ex-post evaluation 2007**)
- Decrease in the numbers of private vehicles entering the charging area: 21% in London, 28.5% in Milan, and 29% in **Stockholm**; decrease in traffic levels by 85% in **Durham**. **Valletta** saw a 60% decrease in long car stays, but a 34% increase in short car visits.
- Increase in public transport speeds during peak hour: 7% for buses and 4% for trams in Milan;



In **Gothenburg** peak hour traffic dropped by 20% in the first month of the charge, but after 10 months traffic levels were only 8% to 11% lower than before the charge. In London, congestion levels have risen back to almost the same level as before. A possible explanation is the general increase in transport demand, but also the increase in construction sites in the city centre and perhaps the conversion of more road space into cycling and pedestrian facilities (sources: **TfL's 6th annual impacts monitoring report** and **roadpricing blogspot**). In any case, congestion in London would have been far worse without the scheme.

Improving air quality and reducing pollution



In Milan reduction of pollution was the initial focus. They started out with ECOPASS, a pollution charge that caused a switch to cleaner cars but did not affect congestion levels. In 2012 it was replaced by **Area C**, a combination of a congestion charge with a low-emission zone that cannot be entered by the most polluting vehicles.

Studies of the environmental effects of congestion charging show **mixed results**, but nevertheless significant reductions in air pollutants were found in Milan (CO₂ -35% and PM₁₀ -18%), London (CO₂ and PM₁₀ -12%) and Stockholm (PM₁₀ -18%). (Source: Rupprecht Consult, 2014)*. Implementing a congestion charge, prepared in support of the development of an EMAS Sectoral Reference Document on **Best Environmental Management Practice for the Public Administration sector**)

Generate revenue and promote modal shift



Congestion charging can be used to generate revenue to invest in sustainable transport modes. Similarly, the four largest cities in Norway fund their SUMP or "City Package of Measures" ("Bypakke") with the revenue of tolling schemes. Through these investments and the economic disincentive of the fee, congestion charges can promote modal shift to walking, cycling and public transport. In Milan the number of public transport users increased by 12% on surface transport and by 17% on the underground. Despite the declining impact on car traffic in **Gothenburg**, the number of public transport passengers continued to increase throughout the first year. The number of multimodal journeys increased by 10% and the car park occupancy at park and ride facilities rose from less than 70% to 85%. Interestingly, a **study in Stockholm** suggests that congestion charging schemes can encourage people to become more environmentally conscious in general.

More quality of life and road safety

A reduction in traffic and congestion frees up space for other purposes. As we mentioned earlier, London has reallocated more road space to sustainable transport modes. Walking and cycling also become safer as congestion drops. An important side effect of the London CC was a decline in **traffic crashes** and **bicycle accidents**. In Milan the number of road accidents dropped by 24%.



Children cycling in Hyde Park in London

A sensitive debate

In some countries, like the Slovak Republic there is no legal basis to introduce congestion charging. But even when there is one, congestion charging is still a very sensitive topic for politicians and citizens. Several planned schemes have died in political debate, e.g. [New York](#), or in public referendums, e.g. [Edinburgh](#) and [Manchester](#), UK; and [Gothenburg](#) after 1.5 years of implementation. Even in countries with a long tradition in tolling schemes, such as [Norway](#), cities are still hesitant to implement congestion charges. Out of the existing eight cities schemes the cities of Trondheim and Kristiansand have time-differentiated tolling schemes appearing as a congestion charging light. Norway has however no real road charging or congestion charging scheme even though the legal basis for it was established in the Road Traffic Act in 2011. [Overview map](#).



In 2006, the majority of surrounding municipalities were against the Stockholm congestion tax (marked in red). Map by [Slarre](#) / CC BY-SA 3.0

Opponents often regard the charge as yet another fee that raises the already high level of taxation of the motorists. In Norway, some research reports suggested that the rush hour price in Oslo had to be as high as NOK 30-40 (appr. €3.5 to €4.6) per trip to influence traffic volumes.

Other objections include:

- the displacement of traffic into adjacent areas. In many cases no such effect has been observed, but in [Gothenburg](#) it has;
- Customer loss for businesses within the area. Much debated in London, but [one study](#) suggests impact was mostly neutral;
- Costs of installing charging technology and higher administration costs than traditional tax collection;
- Inequality: a congestion charge is a regressive (flat) tax, meaning that low-income groups pay a much larger share of their income than the more affluent. This discussion is currently going on in [China](#).



Congestion charging in Gothenburg - Photo by [Erik Lundin](#) / CC BY-SA 3.0

In any case, a city needs excellent and affordable alternatives to the car when it implements a congestion charge. Most cities that have successfully implemented a charge have invested a lot in public transport improvements and infrastructure for walking and cycling. In fact, insufficient public transport capacity is one of the main reasons why the city of Helsinki in Finland still hesitates to implement a congestion charge (read more [here](#)).

How to win support?

Of course, congestion or air pollution needs to be perceived as a real problem in the city if a congestion charge is to be accepted by the public. This probably explains why in the smaller city of Gothenburg the scheme was rejected after 1.5 years, while in the much larger Milan a staggering 79% of voters said yes to Area C, and public support in Stockholm rose from 36% to 74% after implementation.



The centre of Valletta in 2005 - Photo by [Jens Reimann](#) / CC BY-SA 1.0

Stockholm took the hurdle of public opposition by proposing a temporary [7-month trial](#), which was accepted by a slight majority (51%). In combination with a massive and costly improvement of public transport, the test managed to win citizens over for a permanent scheme. Another experiment that might give citizens a taste of the goals of congestion charging, is to make a neighbourhood almost completely car-free for a month, like they did in the [first EcoMobility World Festival](#) in Suwon in South-Korea.

The interest of businesses located in the area can be taken into account with special measures. In Milan, the charging period ends early on Thursday so that people can take advantage of late shopping (Source: [ec.europa.eu](#)). In Valletta, companies, restaurants and shops can buy congestion charge vouchers to offer free parking time for their employees or customers. In Area C residents of the restricted zone get their first 40 accesses for free every year .



The exclusive use of the revenues to improve mobility-related infrastructure and services and to boost the accessibility and liveability of the congestion charge zone helps to make the congestion charge more publicly acceptable. The London Congestion Charge has the **explicit support** of the business membership organisation London First, as congestion represents a major economic cost for businesses.

Alternatives to congestion charging



Photo by Holger.Ellgaard / CC BY-SA 3.0

According to the **Economist**, congestion cannot be tackled sufficiently without some form of road user charging. "To me, it is hard to understand why we in capitalistic societies, where we use the market to distribute most of the goods in life, still use queues and congestion to distribute road space," says Björn Abelsson from the municipality of Sundsvalls on **LinkedIn**. But of course, each city will have to evaluate if a congestion charge is the best fit for their city's transport system and political climate. Let's have a look at some alternatives.

Despite the successful example of small-scale congestion charging in **Durham**, smaller cities with a compact, "walkable" centre would probably prefer to invest in the **pedestrianisation** of streets and allocating more road space to PT and cycling. (Rupprecht Consult, 2014)



Photo by Andrew Hill / CC BY-SA 2.0

Judging from the number of schemes, **access restrictions** seem to be less controversial and probably cheaper to implement. Some schemes contain elements of congestion charging, such as the **Limited Traffic Zones** in Italy (e.g. Rome, Genoa, Florence), where access is restricted to specific users such as residents, taxi drivers and disabled people and some of those users need to pay an annual fee for their permit.

Access restrictions or charges for polluting vehicles in **low-emission zones** (LEZ) are quite common in Germany, Italy, Denmark and the Netherlands. In Germany, municipalities were rather forced to introduce them e.g. by environmental organisations going to court. They are still much debated and a study revealed that much better effects for clean air could be achieved by applying measures such as restricting or redirecting or slowing down traffic in only about 25% of the time compared to permanent measures. In Austria the first environmental zone, to be located in Graz, never made it through the referendum. LEZ can be successfully combined with congestion charging, as demonstrated in Area C in Milan and the LEZ that covers most of **Greater London**. Additionally, by 2020 the London congestion charge zone will be turned into an **ultra low-emission zone**, creating an extra charge on top of the congestion charge.



Photo by Psychonaut/Markus Baumer / CC BY-SA 2.0

To a certain extent, managing **parking** supply and raising parking fees can achieve the same objectives as a congestion charge. In 2012 Nottingham introduced a **Workplace Parking Levy** as an alternative to congestion charging and this option is now being explored by several other UK local authorities as a less politically controversial means of reducing congestion and raising revenue to fund transport improvements. But obviously, parked cars do not contribute to congestion as much as moving ones, parking fees do not affect through-traffic, and many car drivers have free parking spaces in the city centre. When combined, parking management and congestion charging can create important synergies. Or parking fees can be reduced when a congestion charge is introduced to make the charge more politically palatable, as happened in Singapore for example.

In Jakarta in Indonesia and Beijing in China alternative demand management schemes are on the verge of being replaced by a congestion charge. In **Jakarta** the charge would replace the existing "three-in-one" **car-pooling** scheme, which requires at least three people in a car along some roads in Jakarta during the morning and evening rush hours on weekdays. In Beijing, China, there currently is an **End Number License Plate Policy** prohibiting cars with plates ending in a certain number from driving in the city centre on certain days. There is also a **License Plate Lottery**, limiting the number of new license plates to be registered each month.

In the Netherlands, there have been many experiments with a more **voluntary approach** for relieving congestion during peak hours, with many **peak avoidance projects** mostly on highways.

Belgium, a very densely populated and congested country, is rather considering a national **kilometre taxation** system. A scheme for trucks will be implemented in 2016 (see this **video**) but a proposed kilometre charge for private vehicles generated a heated debate and has not been concretised so far. In 2011, a **trial project** with a fictitious kilometre charge showed that people do change their behaviour for the better and congestion can be relieved through kilometre charging. The Finnish Ministry of Transport and Communication also studied the benefits of a potential shift to a kilometre taxation system (2014).



Photo by Certo Xornal / CC BY 2.0

Combination of measures



Photo by [Neville](#) / CC BY-SA 3.0

It is important to consider congestion charging as embedded in a SUMP with a whole set of other sustainable mobility measures. Congestion charges can deter some drivers, but as congestion levels are reduced, others may find driving into the city more attractive. Mobility management can play an important role in mitigating the negative impacts of a charge in surrounding areas, and can help build a lasting impact on people's travel behavior.

In London congestion charging works in conjunction with mobility management measures such as awareness campaigns, and school and company [travel plans](#). Similarly, Nottingham uses the workplace parking levy together with mobility management instruments to improve transport options in the city.



The HentMEG car-pooling app in Bergen, Norway. <http://2pluss.info/>

Another powerful combination is to promote car-pooling together with the congestion charging scheme. Instant car-pool matching tools could offer an alternative to the private car with a degree of flexibility that public transport could never accomplish. The Norwegian National Road Authority runs a [pilot project](#) (link in NO) in Bergen, and the city council has asked for an assessment of introducing a tolling rebate for cars that are used for ridesharing. But when we look at the [debate around the app Uber](#), it becomes clear that there are some legal issues to sort out before car-pooling can become a full part of the transport offer.

What will the future bring?

It is clear that congestion charging can be a powerful instrument, if the necessary legal basis and transport alternatives are in place. It is hard to say if congestion charging will really become a wide-spread phenomenon and it is up to local authorities and their citizens to decide if they are ready to take this bold step.



Discover more



Source: openstreetmap.org / CC BY-SA 2.0

In the past, several resources were developed on the subject of congestion charging and road pricing:

- Overview of road charging schemes and LEZs: www.urbanaccessregulations.eu
- An [overview of EU legislation](#)
- <http://roadpricing.blogspot.com>
- TIDE e-learning course: [Road user charging: how it works, the challenges and the benefits](#). (Rupprecht Academy, 2014)
- Paper Nordic Communications Corporation: [Road pricing by tradable slots](#) (2013)
- Thesis Lund University: [Congestion pricing in urban areas – Theory and case studies](#). (Jarl, 2009)
- [COMPETENCE Reference material 'Congestion and road pricing'](#) (2006)
- [CURACAO project](#) – knowledge base on urban road user charging and case studies

*To be published: Rupprecht Consult, 2014. Implementing a congestion charge, prepared in support of the development of an EMAS Sectoral Reference Document on [Best Environmental Management Practice for the Public Administration sector](#)

Upcoming events

- **PUMAS Final Conference**
12 May 2015 – Venice, Italy
www.eltis.org
- **CIVITAS training on company mobility management**
20 May 2015 – Utrecht, The Netherlands (at the ECOMM)
www.civitas.eu



- **ECOMM – European Conference on Mobility Management**
20-22 May 2015, Utrecht, Netherlands
see [website](#), brief [overview](#) and [registration](#)
- **2nd European conference on SUMP**
16-17 June 2015 – Bucharest, Romania
www.eltis.org
- **3rd World Collaborative Mobility Congress (Wocomoco)**
25-26 June 2015, Innsbruck, Austria
see [website](#)

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