

A GENERAL INFORMATION		
A 1	Category	Pricing
A 2	Subcategory	Infrastructure Charging / Access Restrictions Schemes
A 3	Transport policy measure (TPM)	Area charging / Cordon pricing
A 4	Description of TPM	Charge motorised vehicles for entering or driving in an area, usually the city centre. Motorised vehicles are charged for their use of road space in a certain area and/or during a particular time period. By increasing the cost of travelling at certain times, in certain areas and/or along certain routes, policy makers attempt to influence the demand for road use.
A 5	Implementation examples	The city centre of London (area charging), and the city centres of Oslo and Milan (cordon pricing). In area-based congestion pricing, drivers pay to enter a designated area and/or to drive in that area. They can drive freely within that area for the whole day. The disadvantage of area charging is that it is (in practice) more difficult to implement than cordon-based pricing, especially if the charging area is large. This is because all cars within the pricing area have to be monitored. With cordon-based pricing, only cars entering the cordon have to be checked. The disadvantage of cordon pricing is that vehicles that remain in the area (i.e. polluting vehicles) will never be charged [5]. Both systems (area charging, cordon pricing) result in a reduction of the modal share of the car, in favour of public transport and slow modes. This leads to a reduction of green house gas emissions. Note that urban road transport produces a large part of all emissions that are harmful to the climate. From that point of view, the measure is basically an effort to make drivers pay for the delays/costs/pollution/congestion/etc they impose. It forces them to reconsider their mode choice [6]. In Rome this had a reverse effect after introducing a congestion charge for cars in the inner city. To avoid charges, people started using motorcycles. This resulted in pollution levels, higher than before the implementation of the charging system [3].
A 6	Objectives of TPM	Congestion reduction in the city centre, creating a change in the mode choice, less pollutant emissions, generate revenues or a combination of these form the objective of this measure. An integrated approach where aims are combined, is generally most preferable [4]. From political point of view, toll systems serve to protect the environment and avoid traffic in city centres. In practice you can distinguish a variety of tolling systems, each with another aim: reduce car traffic and emissions (pollution/noise), finance public transport, create additional revenues, or a mix of these. The congestion charging system (i.e. London) focusses on regulating traffic. It usually covers only a small area. Revenues are used to enable financing additional collective transport systems to/from the city centre. Another type of tolling system (i.e. Oslo) primarily aims at bringing in revenues. To achieve that, they usually cover a wide area. The third type of tolling system (i.e. Milan) aims at changing the behaviour of car drivers, by applying toll charge rates depending on the emission category of the vehicle [3] [4]. In all cases, area charging reduces the modal share of the car, in favour of public transport and slow modes of transport. This results in a reduction of green house gas emissions. Urban road transport produces a large part of all emissions that are harmful to the climate. From that point of view, charging is basically an effort to make drivers pay for the delays/costs/pollution/congestion/etc they impose. It forces them to reconsider their mode choice [6]. An important aspect of this TPM is, that it may not reduce congestion to the expected level. Due to characteristics such as loading / unloading of lorries in narrow streets, insufficient travel alternatives, congestion may remain. Therefore, before this TPM is introduced, these aspects should be studied, in order to design a well balanced set of TPMs, taking other problems into account as well.
A 7	Key changes concerning:	
A 7.1	- Choice of transport mode / Multimodality:	Reduction in the modal share of the car, more travel by public transport and slow modes
A 7.2	- Origin and/or destination of trip:	Households tend to move towards the inner side of the toll cordon, while jobs/employment tend to move to the outside
A 7.3	- Trip frequency:	Necessary trips (like work trips) show a reduction in car use. Discretionary trips (like shopping) might be redirected to other locations
A 7.4	- Choice of route:	When toll cordons do not fully enclose an area, drivers will try to avoid these cordons leading to congestion on other routes. Discretionary car trips (like shopping) might be redirected to other locations.
A 7.5	- Timing (day, hour):	No impact, when time windows are not applicable
A 7.6	- Occupancy rate / Loading factor:	Probably increased occupancy rate in passenger cars, as vehicles are charged and not their individual occupants
A 7.7	- Energy efficiency / Energy usage:	Due to reduction of modal share of the car (in favor of slow modes and public transport), a small reduction in green house gas emissions.
A 8	Main source	sorted numerically: [3] [4] [6]

B IMPACTS

B 1 OVERVIEW ON IMPACTS		AFFECTED SEGMENTS													Geographical level		Source							
		Passengers					Transport operators					Employees in transport	Residents	Economy	Public bodies	Society	1st level	2nd level	Source of assessment	Spatial level of source				
		Road	Rail	Air	Public transport	Slow modes	Road	Rail	IWW	Air	Maritime										Public transport			
B 1.1	Summary	↓			↑	↑	↓					↑	↑	↑	↑					L	R	S	I	
		The measure may lead to less congestion in the city centre, resulting in reduced pollution. Residents within the charged area will benefit from this. The use of public transport and slow modes will increase, car use will reduce. The society will benefit (direct or indirect) from the collected revenues. Employers show a tendency to move towards the outside of the charged area. Keep in mind that reduction of congestion is not guaranteed, due to potential problems such as frequent loading/unloading of lorries or a lack of good alternatives such as public transport.																						
B 1.2	Summary: Income groups	No impact. High income groups are less sensitive to charges. It is likely the measure does not effect their behaviour.																						
B 1.3	Summary: Age groups	No impact																						
B 1.4	Summary: Disabled people	No impact																						
B 1.5	Summary: Gender groups	No impact																						
B 1.6	Summary: Ethnic groups	No impact																						

B 2 TRAFFIC IMPACTS		AFFECTED SEGMENTS													Geographical level		Source							
		Passengers					Transport operators					Employees in transport	Residents	Economy	Public bodies	Society	1st level	2nd level	Source of assessment	Spatial level of source				
		Road	Rail	Air	Public transport	Slow modes	Road	Rail	IWW	Air	Maritime										Public transport			
B 2.1	Travel or transport time	↓					↓													L		S	I	
B 2.2	Risk of congestion	↓					↓													L	R	S	I	
B 2.3	Vehicle mileage	↓			↑	↑	↓					↓								L		S	I	
B 2.4	Service and comfort																							
B 2.I	Overall impacts on social groups	None.																						
B 2.II	Implementation phase																							
B 2.III	Operation phase																							
B 2.IV	Summary / comments concerning the main impacts	In general: Road travel times will be reduced due to less congestion. This also results in less pollution. The overall total vehicle mileage will reduce, due to a reduction in car share in favor of public transport and slow modes. For public transport that does not necessary result in an increase of vehicle mileage, only in the summed up passenger mileage and/or occupancy rate. However, when the public transport network or its frequency increases, the vehicle mileage increases. Note that toll cordons need to fully enclose an area, to prevent drivers to take "alternative routes" to avoid charging. Such situations might lead to congestion on alternative routes, longer travel/transport times and/or increased vehicle mileage.																						
B 2.V	Quantification of impacts	The variety of charging aims (i.e. reduce car traffic, reduce emissions, finance public transport, create additional revenues, or a mix of these), the variety of locations (city centres) and the variety in area size, make it impossible to produce elasticities or trade-offs.																						

