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Addressing the environmental impacts of road transport

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Introduction

Road travel is the most common form of travel in today's society. For example, in 2004 the proportion of all passenger travel completed by road was 89% in the USA and 85% in the EU (Eurostat 2007). Worryingly, this considerable volume of road travel is having a significant impact on the environment, with 15.9% of all man-made carbon dioxide emissions coming from road transport. In this case study we consider different ways in which the environmental impacts of road travel can be reduced.

Findings

There are two main policy approaches to address the environmental impacts of road travel: i] Command and control polices, and ii] Incentive based policies. We consider the advantages and disadvantages of these different approaches in order to identify the most appropriate way forward.
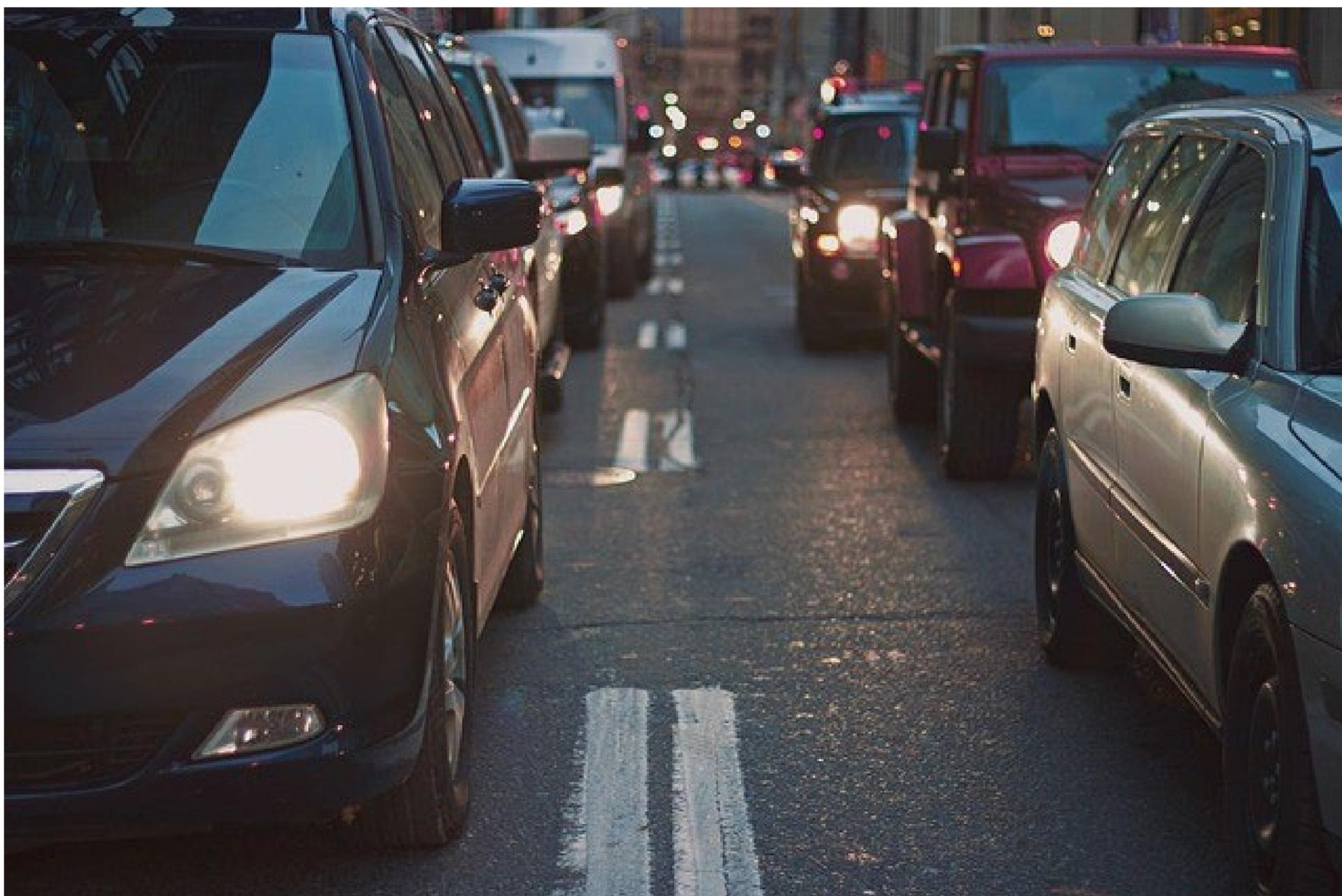
Command and control policies

Command-and-Control (CAC) policies are environmental policies in which regulators (typically governments) set standards or limits that apply universally. An example of a CAC policy targeted at road travel is the standard that countries impose on motor-vehicle fuels. The most notable example is the ban on lead in petrol, which has been implemented virtually all over the world. Lead had been used as an additive since the 1920s but it was a pollutant of great concern, mainly due to its effects on children's brains and was therefore phased out and finally banned in most countries (Faiz et al, 1996).

These types of policies are relatively easy to implement and enforce (Button, 1990) and until recently they have been the most common mechanism for managing the environmental impacts of road transport. However, this approach is inflexible and it does not provide incentives to go beyond the mandatory standard. As a result there have been innovations in alternative approaches, based upon financial incentives.

Incentive based policies

Incentive Based (IB) policies provide economic incentives in order to alter the behaviours of people and organisations. Unlike CAC policies, IB policies leave consumers and producers of road transport with the opportunity to make choices according to their costs and benefits, preferences and constraints. IB policies can take two forms; they will either be quantity controls or price controls.

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Quantity controls

Quantity controls cap the amount of pollutants emitted by allocating permits or rights to those who are the emitters. The emitters are then free to trade their permits amongst themselves. As yet, quantity controls have not been used to manage the environmental impacts of road transport.

Price controls

Price controls are mainly taxes and charges. For example, by introducing a carbon tax, or at least a fuel tax, drivers are motivated to reduce fuel consumption. At the same time vehicle producers will try and improve the fuel economy standards of their vehicles. Whilst this has obvious beneficial impacts it can also have a rebound effect as the vehicles may simply be used to drive longer distances because they are now more fuel efficient, rather than reducing emissions.

Traffic congestion is not effectively addressed by fuel taxes. A fuel tax may reduce demand for travel, but it may not reduce it sufficiently during congested periods. Congestion can be targeted better with a congestion charge. Examples of congestion charging are limited, with only three urban schemes: Singapore, London and Stockholm. There are also a few High Occupancy Toll lanes in the US. The most fine-tuned system is the Electronic Road Pricing scheme in Singapore, which charges different rates to different vehicle types, at different locations and times of the day.

Conclusions

- CAC policies are not difficult to implement or understand and guarantee that the target (a certain emission reduction, for example) is achieved. However, these policies do not encourage producers and consumers to go beyond the mandatory standard. By contrast, IB policies do not impose any choices, but rather leave consumers and producers to make decisions according to their preferences and constraints.

- When we consider specific IB policies; taxes and charges have been used in the road transport sector around the world for many decades and seem to work quite well, as long as there is a clear link between the issue they are targeting and the tax or charge itself. Tradable permits, on the other hand, have not been implemented in road transport but there is an ongoing debate as to whether they should.

- This project was carried out when Georgina Santos was at the Smith School of Enterprise and the Environment, Oxford University

References

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- Eurostat (2007) Panorama of Transport, Luxembourg: Office for Official Publications of the European Communities. http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-DA-07-001/EN/KS-DA-07-001-EN.PDF
- Faiz, A., Weaver, C. and M. Walsh (1996) Air pollution from motor vehicles: Standards and technologies for controlling emissions, International Bank for Reconstruction and Development/World Bank: Washington DC

Further information

- Congestion Charging: www.cchargelondon.co.uk/effect.html / http://content.tfl.gov.uk/central-london-congestion-charging-impacts-monitoring-sixth-annual-report.pdf
- RAC Report: Air Quality and Road Transport – Impacts and Solutions: http://www.racfoundation.org/assets/rac_foundation/content/downloadables/racf_ricardo_aea_air_quality_report_hitchcock_et_al_june_2014.pdf