Cities that subsidize transit will get the best value for money in the absence of congestion pricing and bus lanes.

Should urban authorities subsidize public transport systems? Many academics who have studied transport pricing disagree on the answer. In new research, which examines transit subsidies in London, UK, and Santiago, Chile, **Leonardo Basso** *and* **Hugo Silva** *find that bus lanes, car congestion pricing, and subsidies can all be very effective in improving people's welfare – but that adding an additional policy does not have as much of an effect as the first. They argue that policymakers who wish to help the poorest should put into place transit subsidies, as this will do the most to help the poor and redistribute incomes, compared to the alternatives.*

Subsidies to public transport systems are large in the developed world: they reach around 70 percent of operational cost on average for the largest 20 cities in the US and similar figures are found in other developed nations. The reality is quite different in the developing world where subsidies are inexistent or rather small.

Transit subsidies are controversial and their existence is a matter of continuous debate. There are appealing economic arguments in favour of and against subsidizing transit and the empirical literature on urban transport pricing has delivered different and sometimes contradictory results. It is difficult to infer which approach is correct. In new research, we provide a new assessment showing that the benefits of transit subsidization are large only when optimal congestion pricing and dedicated bus lanes are not in place or when policymakers wish to give the most help to the poorest (vertical equity).

Why transit subsidization?

The reasons that are advanced to support transit subsidization are many. First, there is the so-called Mohring effect: increasing ridership through subsidized fares leads to higher service frequencies, which diminish waiting times of all users. A second argument refers to the un-priced negative externalities that car travel generates (e.g. congestion, pollution and noise); since car travel is a substitute for transit travel, when these negative externalities are not charged to car drivers, the second-best alternative is to reduce the price of transit, potentially implying the need for subsidies. Finally, there are equity considerations: usually, transit is used by poorer people and, therefore, subsidizing transit is a mean to achieve income redistribution.

Rebuttals and evidence

Usual rebuttals against these arguments are that reducing the price of transit it is not enough to attract car users; that the public funds have a sizeable cost so the funds necessary to cover transit deficits may produce welfare losses; and that subsidization develops a negative and important effect on cost efficiency generated, among other things, because of inefficient use of labour and capital.

Empirical results provide mixed evidence. For example, Proost and van Dender (2008) find that the optimal transit fare in the peak-period in Brussels may be close to zero, while the recent analysis by Parry and Small (2009) show that extending subsidies beyond two-thirds of operating costs is in London, Washington DC, and Los Angeles improves welfare. On the other hand, Winston and Shirley (1998) find that for major US cities an efficient policy would sharply raise all bus fares and substantially cut frequency of service everywhere.

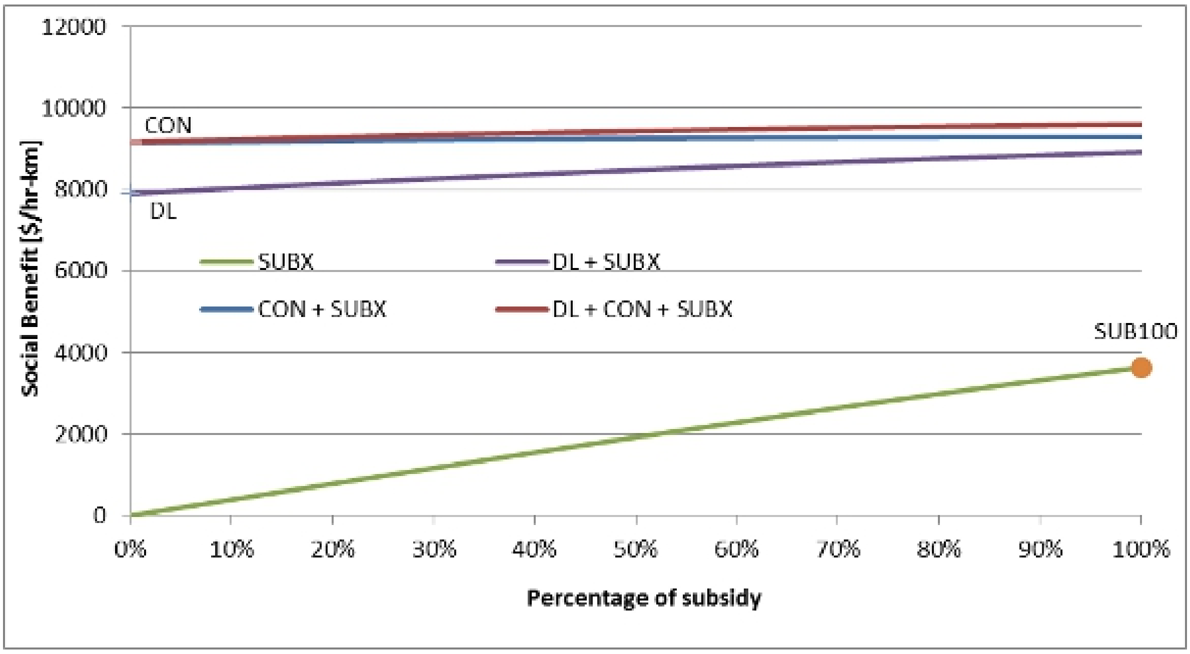
Our analysis

The picture on transit subsidies is rather unclear. To help clear things up, we use data from a large city from the developed world –London, UK– and from another large city from the developing world –Santiago, Chile– to provide a new assessment of the efficiency and desirability of transit subsidies. We also study its interaction with other urban congestion management policies, namely car congestion pricing and dedicated bus lanes.

Our model considers demand substitution between private and public transport, peak and off-peak periods and that people may choose not to travel at all. We also consider that there is mutual congestion between transport modes –that is, buses and cars congest each other while in motion and at bus stops–, that public funds are costly to obtain and that the bus system adapts efficiently (frequency, bus size and fares) to the new conditions after policies are implemented. By simulating the model using data from London, UK, and from Santiago, Chile, we analyse the robustness of results to different situations regarding consumer preferences, income, and costs.

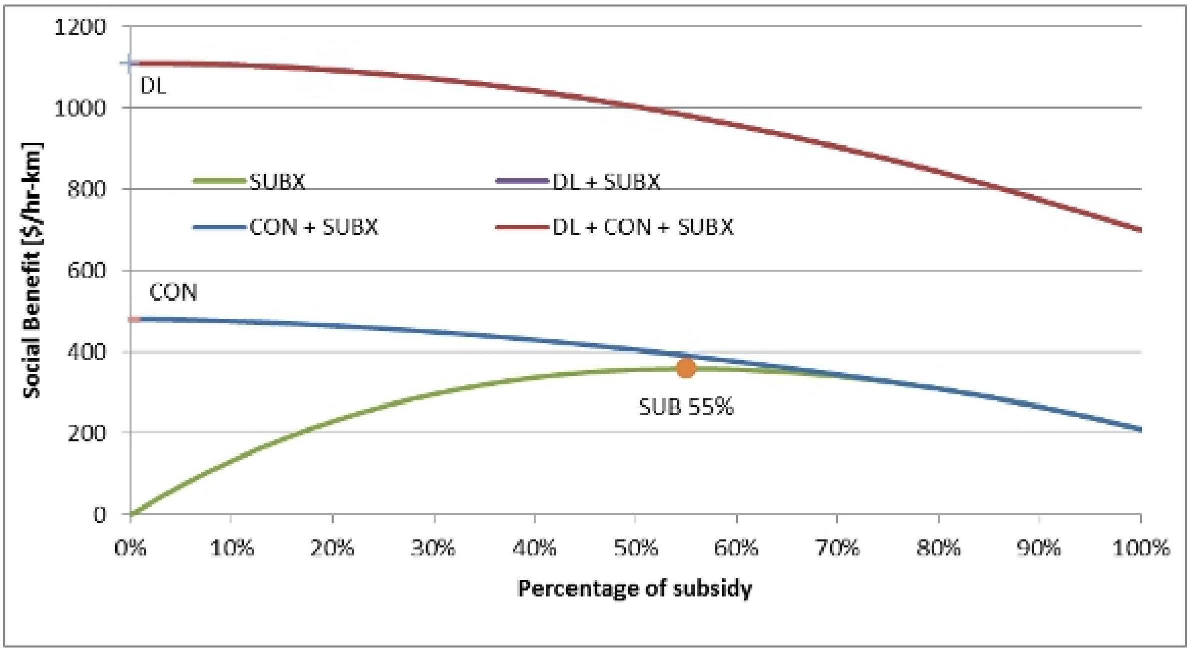
We first consider as user benefits a willingness to pay (WTP) measure. This might be argued to be regressive since WTP depends not only on preferences but income as well. As Figures 1 and 2 show, we find that the substitutability between the three policies is large and, in particular, that the benefit of subsidizing transit may be very small if other policies are implemented first. Moreover, transit subsidization may even be undesirable in the presence of car congestion pricing or dedicated bus lanes. We also find that bus lanes are an attractive way to increase frequencies and decrease fares without injecting public funds.

Figure 1 – Benefits from implementing car congestion pricing, bus lanes, and subsidizing bus operational costs. London.



Note: CON – Car congestion pricing, DL – Dedicated bus lanes, SUBX – Subsidy for X percent of bus operational costs.

Figure 2 – Benefits from implementing car congestion pricing, bus lanes, and subsidizing bus operational costs. Santiago.

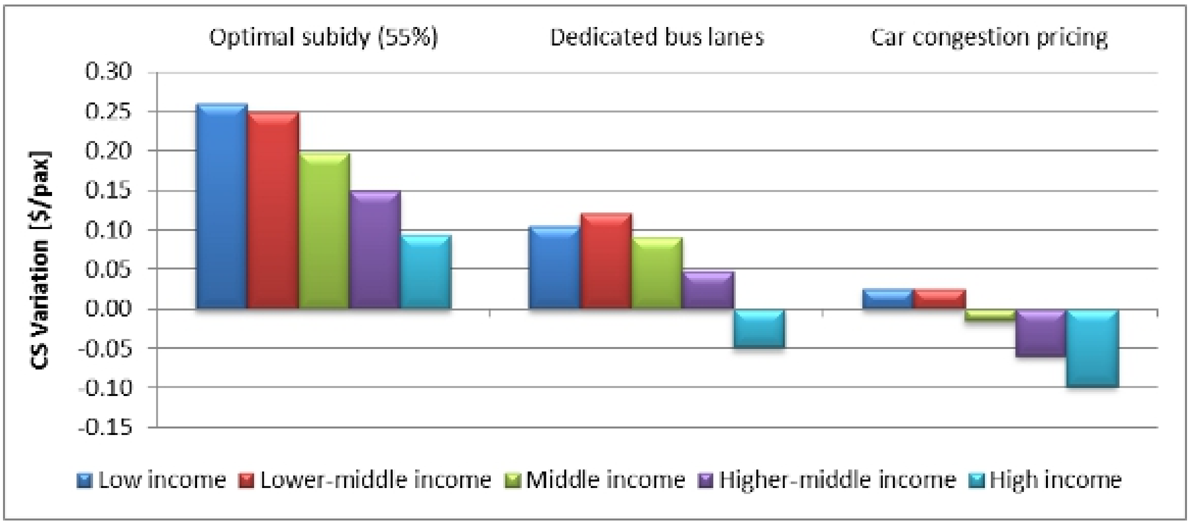


Note: CON – Car congestion pricing, DL – Dedicated bus lanes, SUBX – Subsidy for X percent of bus operational costs.

It can be seen that the benefit that each stand-alone measure (see CON and DL at 0 percent and the maximum of the SUBX curve) achieves is different between applications. In London, car congestion pricing and bus lanes increase social welfare significantly and by similar amounts, while optimal subsidization (free buses) achieves much less. In Santiago, bus lanes yield a much higher benefit than congestion pricing and optimal subsidization. However, in both cities there is large efficiency substitutability among these three policies, that is, once one is implemented, adding another does not increase welfare as much. In particular, the marginal contribution of transit subsidies to welfare is large only when none of the other urban policies considered are in place. Importantly, if instead of considering direct willingness to pay we correct for income differences because of vertical equity considerations, optimal subsidization can become the best stand-alone measure, with bus lanes and congestion pricing being less substitute measures.

Segregating traffic through bus lanes seems to be particularly appealing, as it achieves large welfare improvements without subsidies or cumbersome car congestion tolling, affecting bus and car travellers through quality of service (speeds) instead of monetary prices. Moreover, the bus lane policy induces the largest increase in frequency for both cities, and it does so without the use of subsidies, which are often defended as a mean to, indeed, increase frequency. For the case of Santiago, where data enables a full distributional analysis, we further find that congestion pricing happens to be a progressive measure if the transit system improves to cover the new demand, even before using revenues from tolls or correcting the user benefits measure for income differences. This is an important point as one of the usual critiques against congestion pricing is that it would be regressive, by pricing off the streets those who benefit least from the speed increase due to low values of time, and therefore, with lower income. As Figure 3 shows, we further find that dedicated bus lanes are also progressive, and that optimal transit subsidization benefits all travellers.

Figure 3 – Consumer surplus variation by income group with the implementation of three policies. Santiago.



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About the authors

Leonardo Basso – *Universidad de Chile*
Leonardo J. Basso is Associate Professor at the Department of Civil Engineering at the Universidad de Chile. His areas of research are transport economics and industrial organization. He has particular interests both on air transport –focusing on the industrial economics aspects such as privatization and pricing of airports– and in urban transport planning and policies.

Hugo Silva – *VU University Amsterdam*
Hugo E. Silva is a PhD candidate at the Department of Spatial Economics a the VU University (Faculty of Economics and Business Administration). He is currently studying the industrial organization of aviation markets with special focus on airport pricing policies.