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Editorial - Household transport costs, economic stress and energy vulnerability

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1. Introduction

Since the early 2000s issues of transport poverty and social exclusion have received increasing attention in transport studies (Dodson et al., 2004; Hine & Mitchell, 2001; Lucas et al., 2001). Although much of this research has focused on low-mobility and/or carless individuals, there has been growing awareness that the costs of daily mobility can have important economic stress impacts. In developed countries with high levels of car dependence, the costs of motoring can be burdensome, raising questions of affordability for households with limited economic resources.

A number of developments in the first two decades of this century have contributed to raise the profile of household transport costs as a research topic and a policy concern. First, and more obviously, increasing and increasingly volatile global oil prices have raised concerns for the vulnerability of households to fuel price increases (Dodson & Sipe, 2007). Second, the rise of the climate change agenda has led to consider pricing measures as a key component of sustainable transport policy. Implementation of such measures however, has often been hampered by concerns for the distributional impacts of increasing transport costs faced by households. Third, the global financial crisis of 2007-2008 and its aftermath have highlighted broader issues of living standards, economic stress and affordability, which go beyond the specific case of transport.

In this context, a further reason to investigate household transport costs has to do with other competing pressures on household budgets. For instance, growing concern in numerous countries around housing affordability (Pittini, 2012; Wetzstein, 2017). Since the early 2000s, a number of applied and academic studies have focused on the combined costs of housing and transport (e.g. Center for Transit-Oriented Development & Center for Neighborhood Technology, 2006). Yet, despite increasing interest, empirical evidence remains surprisingly mixed concerning the assumption that households trade off housing and transport expenditure against each other in decisions about residential location. What is clearer however, is that decisions about housing and transport have critical consequences for urban development. A key overall message from this research is that the outcomes of household residential decisions can be problematic from both an affordability and an environmental perspective.

The above considerations constitute the core concern of this special issue, and informed the background for the International workshop "Energy-related economic stress at the interface between transport poverty, fuel poverty and residential location", which led to this special issue. The workshop was held at the Institute for Transport Studies at the University of Leeds (UK) on May 20-21 2015, and was attended by 41 academics, practitioners and policy-makers. Several of the academic presentations delivered at the workshop have

evolved into articles included in this special issue¹ (Belton Chevallier, et al., 2017; Mattioli et al., 2017; Nicolas & Pelé, 2017; Scheiner, 2017).

This special issue contains 13 papers which, in different ways, focus on household transport costs and their implications in terms of economic stress and energy vulnerability. The papers stem overwhelmingly from Europe, reflecting the original focus of the workshop on French, German and British contexts. These are complemented by three studies on cities in Australia, Canada and Hong Kong. The spectrum of social science disciplines covered is wide, ranging from anthropology (Ortar, 2017) to mainstream urban economics (Coulombel, 2017). From a methodological point of view, the bulk of the articles adopt quantitative methods, but these are complemented by studies based on qualitative interviews with households and stakeholders (Belton Chevallier et al., 2017; Leung et al., 2017; Ortar, 2017), and by papers presenting theoretical overviews (Mattioli et al., 2017; Scheiner, 2017). Beyond these broad classifications, the articles show a remarkable variety of entry points to the topic, as illustrated in the next section.

2. An overview of contributions

The first article sets the policy context for the remainder of the special issue. Leung, Burke, Perl and Cui (2017) show how the nexus of transport, energy and household expenditure emerged as a relevant issue in the 'noughties'. Applying political science analysis frameworks (something which is unfortunately too rare in transport policy research - see Marsden & Reardon, 2017), and using a mix of stakeholder interviews and documentary analysis, they investigate to what extent the 'peak oil' discourse influenced urban transport policy and planning in two Asia-Pacific cities. Whereas in Hong Kong fuel price concerns barely entered the political agenda, in Brisbane (Australia) the notion of 'oil vulnerability' (Dodson & Sipe, 2007) drew political attention and was almost institutionalised in government structures. However, such attention materialised in little actual change in terms of sustainable transport policies, and political interest quickly waned with the election of a pro-car, conservative government and the decrease in oil prices. In a nutshell, the authors suggest that while the coincidence of a left-of-centre government and historically high oil prices opened a brief 'window of opportunity' between 2005 and 2012, the opportunity was not (entirely) seized, and the window was quickly shut. This suggests that, even in very vulnerable cities like Brisbane, issues of household transport costs, economic stress and energy vulnerability struggle to find their way onto the political agenda.

The next two papers present the state-of-the-art of quantitative research on household transport costs, and present findings on spatial and temporal patterns in such costs. Building on their previous work (Nicolas et Pelé, 2016; Nicolas et al., 2014), Nicolas and Pelé (2017), demonstrate how to piece together information from local and national surveys to estimate the entirety of household expenditure on transport (including for instance urban public transport use and parking fees). Using these methods they show trends in the Lyon metropolitan area between 1995 and 2015, a period of increasing motor fuel prices, and decompose them into three drivers: price change, demographic change, and behavioural trends. The results show a number of offsetting effects at work, highlighting connections

¹ Further information on the workshop, including the presentations, is available online at <https://teresproject.wordpress.com/2015/06/02/transport-poverty-workshop-view-all-the-presentations/>.

between household transport costs and 'peak car' debates (Goodwin & Van Dender, 2013). A particularly interesting finding concerns parking costs, which have increased significantly in the last 20 years, as result of both deliberate sustainable transport policies and real-estate pressures. Remarkably, high parking costs in Lyon's city core are found to partially offset the spatial gradient of motoring costs, which are otherwise much greater in Lyon's suburban and peri-urban areas.

While the recourse to survey data allows Nicolas and Pelé to estimate the entirety of household transport expenditure, it also means that the analysis is based on rather coarse spatial units. Chatterton, Anable, Cairns and Wilson (2017) illustrate an alternative approach to investigating the financial burden of transport, which makes use of innovative sources of data. By combining millions of records of UK vehicle safety and inspection data with accompanying registration data, the authors are able to estimate vehicle tax and fuel costs (representing 40% of total car costs) at a very fine-grained level of spatial resolution. The findings show that a greater proportion of income is spent on motoring in peripheral rural areas and in areas with low-to-middle average income. The results are discussed in light of debates on whether existing taxes on car use are socially regressive. While the authors provide important empirical evidence on this point, the debate is likely to remain contentious, given the ambiguous status of car ownership and use (as both a necessity and luxury, a provider of accessibility and the cause of much environmental damage).

The following five articles focus on what happens to transport systems and travel behaviour in times of economic crisis, and on the coping strategies that households adopt in order to reduce household transport costs. More specifically, the first two articles present evidence on the impact of the financial crisis of 2007-2008 in two countries (Greece and Spain) that have been hardest hit by recession and austerity. For these countries, the national crises reverberated throughout the whole national economic system. Whereas for households, this materialised through greater difficulty in affording mobility costs, for public authorities, the crises led to serious budgetary difficulties and reduced public services. In such extreme situations, it is of particular interest to investigate how households adjust their mobility.

Based on annual household budget survey data for the period 2006-2014, Cascajo, Diaz Olvera, Monzon, Plat and Ray (2017) show that spending on transport has reduced during the crisis in Spain, both in absolute terms and relative to income. This is in contrast with housing, whose share of household budget sky-rocket during the crisis. However, the decrease in transport expenditure is largely explained by reduced purchase of cars among higher income households, while the poorest have seen the cost burden of transport increase throughout the crisis. This may suggest that having already cut their travel expenditure to the bare bone, low-income households were unable to reduce them further. Moreover, several Spanish public transport authorities reacted to the crisis by reducing levels of service and increasing fares, likely exacerbating the situation for low-income households. Ironically, another consequence of the recession in Spain has been the postponement of local mobility surveys, which means that the kind of analysis presented in this special issue may become more difficult to conduct in a post-crisis environment.

Papagiannakis, Baraklianos and Spyridonidou (2017) present findings from a household survey conducted in the city centre of Thessaloniki (Greece) in 2014. The instrument included a retrospective component whereby respondents were invited to compare their current travel behaviour to the pre-crisis (2010) situation. The descriptive findings show a reduction in travel expenses during the crisis, which is *more* pronounced among the lowest

income group. This result contrasts findings presented by Cascajo et al. (2017), though the difference may be explained by the survey focus on a dense urban area. Papagiannakis et al. also find a significant shift from car use to alternative modes of transport, and a reduction in 'discretionary' trips, which may have been partly offset by increased trip frequency for work. Provocatively, the authors observe that "the effects of the economic crisis are proving more effective in limiting car use compared to any hard or soft policies and measures promoting sustainable mobility that have been previously implemented in the city '(PAGE). The authors caution that their findings show limited willingness to preserve sustainable mobility behaviour should the crisis end. They conclude with a plea to identify urban transport strategies that preserve and take advantage of the "collateral benefits" of the economic crisis.

The article by Curl, Clark and Kearns (2017) has a similar approach in that it looks at car ownership behaviour in Glasgow (UK) at three points before (2006), during (2008) and after the recession (2011). While the UK has been less hit by the economic crisis than Southern EU countries, especially in terms of unemployment rates, it has had a bigger fall in real wages than most other OECD countries (TUC, 2017). Drawing upon a survey conducted in some of the most deprived urban neighbourhoods in Scotland, Curl et al. find compelling evidence of an *increase* in car ownership between 2006 and 2011, although from a very low level. The authors then focus on 'forced car owners' (i.e. households owning a car despite financial difficulties), whose numbers have doubled over the period. Using panel data, they show that the majority of these consists of 'financially slipping drivers', who entered financial difficulty and yet maintained a vehicle. Overall the study suggests that car dependence and 'forced car ownership' exist even in compact urban areas, and may have gotten worse during the crisis. In the study area, this has led to a decoupling of car ownership and financial difficulties.

The next two papers provide qualitative insights into household coping strategies to high transport costs, and focus on peri-urban France. Ortar (2017) investigated the cumulative effects of income stagnation and increasing transport- and domestic energy prices. In drawing upon interviews with lower-to-middle class households with long commutes in the urban region of Lyon, her findings reveal to what extent household decisions on travel, work participation, childcare and residential (re)location are entangled with each other. One key finding is that they are also particularly affected by employers' decisions, such as when the company relocates or whether it allows working from home. Hence, the author argues that the role of *businesses* for household energy costs should be given more consideration than at present.

Belton Chevallier, Motte-Baumvol, Fol and Jouffe (2017) present findings from a similar study on low-income households living (or having lived) in outer suburban, car dependent areas of Paris and Dijon. Moving from the assumption that these are particularly exposed to 'car-related economic stress' the authors investigate the coping mechanisms that they adopt. The findings highlight two main expedients: concentrating daily activities in the local areas (which for some women means giving up working altogether) and relying on social networks as travel resource providers. A third strategy, i.e. relocating to a less car dependent area, is found to be used only as a last resort and/or when life circumstances change—previous quantitative research by the same authors (Motte-Baumvol et al., 2010) found the third strategy to be a non-negligible phenomenon. The authors highlight the collective nature of these expedients (at both the households and the social network level) and their

interdependence. On the one hand, this indicates expedients may sustain and reinforce each other, but on the other, it also makes them vulnerable to changes in circumstances which are beyond individual control, such as life course events. The authors suggest that policy may have a role to play here, by supporting the coping strategies spontaneously developed by the households. Importantly, this means looking beyond transport policy and integrating other policy areas such as housing.

The last set of contributions includes five papers which, in different ways, highlight further promising directions for research on households transport costs, economic stress and energy vulnerability. The first two articles in this section (Coulombel, 2017; Li et al., 2017) focus on the interplay between transport and housing costs, a theme which has received renewed attention in recent 2017s, although perhaps more in North America than in Europe, and from a housing research perspective (for instance, see the special issue of Housing Policy Debate on 'location affordability'- Renne & Sturtevant, 2016). Using the tools of mainstream urban economics, Coulombel (2017) theoretically investigates how prudential measures in housing access impact transport costs, vulnerability to fuel price increases and urban socio-spatial configurations. He demonstrates that capping the housing burden (as it is often the case for rents and mortgages) has an unintended eviction effect, pushing low-income households towards suburban areas. Here they find more affordable housing, but face high transport costs, which ultimately reduces their solvency. By contrast, capping the 'housing plus transport' burden enables low-income households to remain closer to the city centre, which improves their solvency and protects them from fuel price spikes. Overall, the study's findings are relevant not just for transport vulnerability research, but also for international debates around the 'suburbanization of disadvantage' (Randolph & Tice, 2014). Coulombel concludes by discussing a number of operational challenges to the implementation of policies that cap housing plus transportation costs.

To a certain extent, the article by Li, Dodson and Sipe (2017) provides an empirical illustration of the mechanisms described in Coulombel's model. The study offers a spatial analysis of the costs associated with transport fuel and housing in Brisbane. Based on methods not too dissimilar from those used by Chatterton et al. (2017), the authors combine census and vehicle registration data to estimate household expenditure on car commuting for small spatial units. These are overlaid with housing costs and income data to identify areas where households would be most likely to consider relocating in response to large fuel price increases. Based on the assumption that households would move closer to their jobs, the authors show that a fuel spike would result in low-income outer-suburban residents relocating to middle suburbs. From a methodological viewpoint, the paper illustrates the complexities and challenges of investigating housing and transport costs jointly (on this see also Cao & Hickman, in press; Gertz et al., 2015). The authors conclude by suggesting that urban planning should steer high-density, mixed-use infill development towards public transport nodes in those mid-suburban areas which will see increased demand for housing. This suggests that there are synergies between measures to mitigate 'oil vulnerability' and those aimed at reducing car dependence and transport emissions.

The article by Mattioli, Lucas and Marsden (2017) contrasts research on transport poverty and affordability with the body of work on domestic energy affordability (or 'fuel poverty'). The paper focuses more specifically on the UK context, where substantial research traditions exist in both areas. The authors call into question what they see as a tendency to uncritically adopt fuel poverty concepts, frameworks and metrics in transport poverty research. Based

on an extensive literature in both domains, they highlight areas of similarity, where parallels are instructive, but also underscore key differences, where analogies are misleading. A notable example of the latter is the design of affordability metrics, which needs to be tailored around the particularities of household transport expenditure. By contrast, the authors argue that transport affordability research (and policy-making) would benefit from greater attention to 'mismatches' between patterns of income and energy efficiency, such as when poor households tend to live in car dependent areas, or to use energy inefficient vehicles. On this last point, the authors raise concerns about the electrification of the vehicle fleet, which could worsen such mismatches.

In his position paper, Scheiner (2017) places transport costs in a longitudinal, life-course perspective, making connections with debates on mobility biographies and residential self-selection. The author highlights complex bidirectional relationships between household transport costs and residential location choices, which helps understanding the cumulative development of transport costs in the long run, at both the household- and societal level. Households relocating to suburban and peri-urban areas typically experience an increase in household transport costs (often beyond their expectations), but also cause higher costs for transport provision and externalities. While their decisions reflect preferences, they impose costs on others, and often turn out to be less than perfect in hindsight, e.g. when elderly households find themselves trapped in car dependent areas. Scheiner argues that, in light of expected increases in energy prices, policy needs to put more emphasis on *constrains*, limiting residential choice to areas compatible with sustainable spatial development. Conversely, research on transport costs should give more consideration to household *agency*, in order to understand how economic stress arises throughout the life course. A few studies in this special issue provide empirical insights on this point, based on both quantitative (Curl et al., 2017) and qualitative (Belton-Chevallier et al., 2017; Ortar, 2017) methods.

The final paper in this issue (Walks, 2017) highlights another promising direction for future research: car-related debt as an overlooked form of transport disadvantage. Building on his previous work (Walks, 2015), the author discusses the multiple ways in which car dependence may imply higher levels of household debt. Based on a combination of census data and household survey data on financial security, the study investigates automobile-related debt among low-to-middle income households in Canadian metropolitan areas. The findings show higher levels of indebtedness in automobile loans for lower-income households and, among them, for those living in car dependent areas. These results dovetail with recent findings from the US, where Hartell (2017) has found an association between high rates of automobility and foreclosure risk, and the UK, where Mattioli (in press) has found high levels of burdensome debt for loans among 'forced car owners'. At the time of writing, English-language media are reporting increasing concerns around predatory car loans, with some suggesting that they could trigger the next financial crash (Inman et al., 2017; Silver-Greenberg & Corkery, 2017).

3. Conclusion

Overall, the papers gathered in this special issue highlight the richness of perspectives that can be applied to understand energy-related expenditure for daily mobility. Several threads emerge as particularly worth future research efforts, including (but not limited to): further

delineating and clarifying the interrelationships between mobility and housing costs, explaining transport-related economic stress from a life course perspective, and exploring the links between daily mobility and household debt dynamics.

From a policy point of view, the papers highlight a wide array of implications and make a variety of recommendations, which we have tried to summarize above. In summary, broad policy implications include: politics is an ever present element, and requires more sustained longer term strategies and plans; building resilience to future increases in energy-related transport costs requires that more attention is paid to this topic even in phases of lower oil prices; economic and financial crises can worsen car dependence, but also open up opportunities to take advantage of 'collateral benefits' for sustainable transport; policy makers need to be cognisant and attuned to the spatiality of household transport costs and implications in terms of economic stress and energy vulnerability.

Such policy implications extend to sectors and actors beyond the remit of traditional transport policy. This raises challenges for policy making, which is still generally organised along sectoral lines, which leads for example to issues of energy-, transport-, and housing affordability being considered and managed separately. So while policy and institutional silos continue, greater work is required to learn lessons and create more integrated policy strategies. It would appear that greater cross-sectoral working and integration across relevant policy areas is needed, if the issues highlighted in this special issue are to be effectively tackled.

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