

## International Conference on Mobility Challenges (December 14, 2020)

### Academic sessions

#### Academic session 1

**Christina Littlejohn** (Leibniz Institute for Economic Research, University of Munich)

« Inadvertent repercussions of surpassing the EU fuel economy standard »

#### Abstract

In 2019, the EU set a fuel economy standard for heavy freight trucks to reduce the fleet-wide average emissions for new trucks by 15% compared to 2019 levels starting in 2025 and by 30% starting in 2030. This paper asks: how does one or more member nations enacting a stricter fuel economy standard impact the emissions reduction behavior for the rest of the EU? And to what extent is there carbon leakage and how does incongruous national and international policy affect the total cost of achieving the EU fuel economy standard? To answer these questions, I develop a two-period model for the heavy freight truck manufacturing sector where each producer maximizes profits by setting prices for new trucks and investing in fuel efficiency technologies subject to the fuel economy standard constraints. Demand for trucks is split between two regions: the member nations adopting stricter fuel economy standards and the rest of the EU. The paper reveals the inadvertent trade-off between lower cost of carbon savings and carbon leakage. A single standard begets the lowest policy cost, there exists a trade-off between Bonus-Malus feebate and R&D investment, and the number of over-achievers has minimal effect on policy cost.

**Rim Rejeb** (Grenoble Applied Economics Lab - GAEL)

« Is the impact of transport modes on health an individual determinant of transport mode choice? » (with Bouscasse, H., Mathy, S. and Treibich, C.)

#### Abstract

High modal share of the private car has important health consequences through an increase of cardiovascular or pulmonary diseases. This increase in morbidity and mortality is due to two different mechanisms: air pollution, particularly fine particulate matter in urban areas and sedentary lifestyles (lack of physical activity in our mobility behaviour). In this article, we try to evaluate the extent to which information on the impact of mode choice on public or individual health influences our mobility. In other words, does the fact that taking the car increases the risk of developing cardiovascular diseases for the user, through lack of physical activity, and for his co-citizens, through pollution, have an influence on the choice of alternative modes to the car? We address this question collecting original data in the Grenoble metropolitan area (France) and implementing a Stated Preferences survey. Respondents were presented different scenarios varying depending on mode (car, public transport, walking and cycling), travel time, cost and associated cardiovascular risk. Our findings seem to confirm that information on health risks related to air pollution or lack of physical activity have a significant effect on the preferences of the participants in regards to modal choice. There is a preference for modes that generate a lower risk which means that there is a preference for the alternatives to the car.

**Katherine Farrow** (OECD)

« Environmental implications of the proliferation of high-occupancy shared mobility services» (with Tikoudis, I., Bouyssou, C.G., Oueslati, W., Martinez, L. and Petrik, O.)

**Abstract**

This study estimates the impact that the widespread uptake of shared mobility services could have on the carbon footprint of urban transport. To this end, it simulates the share of each transport mode and aggregate emissions from passenger transport in 247 cities across 29 OECD countries between 2015 and 2050. The simulations make use of econometric estimates obtained from a unique cross-city survey on individual preferences regarding transport modes, including shared mobility. Shared mobility services are found to offer a significant environmental benefit. The analysis indicates that they have the potential to eliminate, on average, 6.3% of passenger transport emissions. This mitigation potential varies widely across cities and depends in large part on current modal splits in cities. The analysis shows that such services will not easily thrive in car dependent environments, where the cost of their provision is going to be higher and preferences for using shared modes of transport are weaker. Cities in which public transport delivers almost all mobility will not see emissions reductions from the uptake of shared mobility services either, as in these cases shared mobility is expected to reduce public transport ridership. In the majority of cities, however, the environmental benefits of shared mobility uptake are positive and, in many cases, considerable.

## **Academic session 2**

**Benjamin Sovacool** (University of Sussex)

« Contextualizing the Covid-19 pandemic for a carbon-constrained world »

**Abstract**

I presented some insights from a Special Issue of Energy Research & Social Science containing 16 articles from 14 disciplines, organized around 4 topics dealing with covid-19 crisis: the energy and climate impacts of the pandemic; implications for social practices or sustainability transitions; connections with energy justice and vulnerability; insights for research practice and methodology. The issue features articles that ask, and answer: What are the known and anticipated impacts of Covid-19 on energy demand and climate change? How has the disease shaped institutional responses and varying energy policy frameworks, especially in Africa? How will the disease impact ongoing social practices, innovations and sustainability transitions, including not only renewable energy but also mobility? How might the disease, and social responses to it, exacerbate underlying patterns of energy poverty, energy vulnerability, and energy injustice? Lastly, what challenges and insights does the pandemic offer for the practice of research, and for future research methodology? We find that without careful guidance and consideration, the brave new age wrought by Covid-19 could very well collapse in on itself with bloated stimulus packages that counter sustainability goals, misaligned incentives that exacerbate climate change, the entrenchment of unsustainable practices, and acute and troubling consequences for vulnerable groups.

**Stef Proost** (KU Leuven)

« Covid-19 and urban transport policy » (with Bruno de Borger)

**Abstract**

This work firstly shows in a simple model why public transport (PT) trips decrease following the covid-19 crisis (disutility of covid). Then it asks what is the optimal reply of PT to the telework and covid infection risks in the short and long run. The telework reduces demand for private and PT modes and it reduces the PT fare and frequency. The covid discomfort decreases the market share of PT: the optimal frequency may increase or decrease, while the optimal fare may increase. The telework and the covid together may have an ambiguous effect depending on the movement of the frequency and the fare (positive or negative). Treating vulnerable and non-vulnerable agents differently may improve welfare: vulnerable agents have a higher WTP for space and one may reserve wagons for these agents. A separating equilibrium requires that the vulnerable agents to pay more for their use of more spaced wagons or that they could be easily identifiable. An application of the model to the Brussels area is presented.

**Jacqueline Piero** (Vice President of Policy for Nuvve Corp)

« The new California regulation landscape for BEV after the 2020 rolling blackouts »

**Abstract**

Nuvve, a global leader in vehicle-to-grid (V2G) technology, offers high-powered charging and grid services that optimize unused and renewable energy. It creates value with revenues on energy markets and with savings from optimizing energy flow to buildings and EVs. The presentation focuses on California context in which from 2017 several actions have been undertaken to support the development of V2G. The regulatory solutions adopted to face extreme weather conditions, such as wildfires and heatwaves, are presented; the impact that these solutions may have for EVs as backup power and potential demand response resource are discussed. Public Safety Power Shutoffs, rolling blackouts, climate targets and EV goals require reconsideration of EV as part of the energy ecosystem. Further efforts are needed in the short-term and long-term to face extreme weather conditions and some possible solutions (offering a larger role for EV and V2G) are illustrated.

### Academic session 3

**Shanjun Li** (Cornell University)

« Efficiency and Equity Impacts of Urban Transportation Policies with Equilibrium Sorting»

**Abstract**

Air pollution and traffic congestion are two of the most pressing urban challenges in many fast-growing economies. Various transportation policies from both the demand and supply sides including congestion pricing, driving restrictions, the gasoline tax, and the expansion of public transit have been adopted to address these issues. We develop and estimate a residential location sorting model to examine the interactions of transportation policies and household sorting. The sorting model incorporate commuting decisions and generates equilibrium predictions of household locations under different transportation policies. We estimate the model parameters using a large household travel survey and rich housing transaction data in Beijing. The analysis illustrates the importance of incorporating travel

mode choices in household location decisions and the importance of understanding sorting behavior in designing effective transportation policies.

**Knut Einar Rosendahl** (Norwegian University of Life Sciences)

« The Tradeoff between Indirect Network Effects and Product Differentiation in a Decarbonized Transport Market » (with Andreassen, G.L.)

**Abstract**

What factors determine whether it is optimal with one or more technologies in a decarbonized road transport sector, and what policies should governments choose? We investigate these questions theoretically and numerically through a static, partial equilibrium model for the road transport market. We find that two important factors that determine whether it will be and whether it should be one or more technologies are how close substitutes the two vehicle technologies are and the number of vehicles of the other technology. Our numerical results indicate that with two incompatible networks, two differentiated goods are optimal compared to only one if they are not too close substitutes. The first-best policy is a subsidy of the markup on charging and filling, where the markup is higher the higher the increased utility of more stations. In addition, to avoid an unwanted lock-in, a temporary stimulus may be needed to reach the stable equilibrium.

**Vincent Viguié** (CIRED)

« Anticipating transit-induced changes in social composition of neighbourhoods: an application to the Grand Paris Express » (with Pfeiffer, B.)

**Abstract**

According to the existing literature, the effects of public transit on income sorting are unclear. We develop a simple model where residence location is mainly driven by accessibility to jobs and job locations differ across income groups to test whether a new transit line that increases accessibility to high-income jobs more than to low-income jobs fosters gentrification. We test this model on past data for the Paris region and we use the model to anticipate the impacts of the Grand Paris Express. We find that the effect of transit on income sorting depends on the geography of the transport network. In Paris, new lines that increased more accessibility to high-income jobs attracted more high-income group workers, and conversely. Using estimated parameters, we provide a (coarse) anticipation of the effects of the Grand Paris Express.

**Edouard Civel** (Ecole Polytechnique & Climate Economics Chair)

« Stranded to be? Diesel ban and used car markets » (with Hoarau, Q.)

**Abstract**

After promoting their development for two decades, European governments are pulling back their support to diesel cars. While those engines were assumed to be « cleaner » than gasoline ones, thanks to lower fuel consumption and reduced CO2 emissions, they turned out to emit much more air pollutants. In response to growing concerns about the effects of air quality on public health, Low Emissions Zones (LEZs) are gradually implemented by several cities, announcing a progressive ban on diesel cars which could turn those vehicles into stranded assets for households. This is a thorny issue in France where half of passenger vehicles are diesel-fueled. Investigating about one million of used cars ads across France, we find that diesel vehicle sellers located within ongoing and planned LEZs anticipate this change of regulation and lower their asking price for those cars. This effect is robust to the

introduction of an air pollution indicator for cities, evidencing a specific effect of this LEZ policy.