

The Role of the Car in the XXI Century: applying mathematical programming models to manage and assess the potential of car-pooling, car-sharing and car-automation

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Mobility, especially on urban environments, has been changing in the last decades, leveraged by new technologies and significant societal changes. Information technologies and new vehicles are making available new mobility solutions like the Uber car or the prospect of a self-driving fleet of shared vehicles, moreover we have deep society changes such as an ageing population who is less able to drive a car and a young population, the so called millennials, who don't want to own a car anymore. Traffic and traditional public transport have been extensively researched in the past making available a set of methods that allow private companies and public authorities to manage these systems in an efficient way. With regard to the new modes and technologies there is however still a lack of knowledge on how to run them or even what type of changes they will introduce in the mobility system. In this plenary session I will be describing different uses of mathematical programming in both, disclosing the impacts, and finding management strategies for three mobility disrupters: car-pooling (several people in the same car), car-sharing (sequential usage of the same car by different people) and automated vehicles.