

An interactive tool for assessing green transport policy

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Climate change is one of the most prominent concerns for the future of humanity in the 21st century. The presence of humanity in the planet may be viewed as precarious, especially when considering the adverse effects of human activity and development. A significant contributor to these emissions is transportation. This paper is concerned with the evaluation of green transport policy. It attempts to address the issues of measuring people's choices in an unstable economic and social environment, simulate a situation with present and future scenarios and finally assess a bundle of green policies depending on a series of key parameters and indicators. This paper explores the notion of green, sustainable transportation in depth. The paper presents an innovative framework for the analysis of decision-making process in transport and activity related matters and it designs and crafts an interactive policy assessment tool that is based on econometric modelling. The econometric modelling is done in three different tiers, the everyday rhythms tier, that is concerned with the everyday activity and transport choices of individuals and how their lifestyle can affect these choices, the light infrastructure tier that explores the effect of active transport friendly interventions in the transport system via measurable key performance indicators and the future fleet purchase tier that provides insight into the future fleet mixture and the effect it will have on the emissions and fuel cost.

The paper uses three main axes of analysis to support the creation of the platform. The first axis is concerned with the lifestyle of the study area, which is used as a case study for the platform. Through different analytic and modeling tools, we measure the effect of lifestyle in every-day transport-related decisions and activities. The hypothesis that different lifestyle can affect these choices is tested through a comparison of similar data from Chios, Greece and Athens, Greece. The second axis contains the assessment of active transport related measures in the study area through a series of KPIs. For this analysis to happen a simulation model of the study area was designed and implemented. The third axis of the analysis is the modeling of future fleet purchase choices. This axis incorporates the various new fuel technologies that can lead to different emission profiles.

The contribution of the paper can be found on several topics. First, the paper explores the notion of sustainable transport and the human behavior that is related to it using a multi-tier analysis that spans from every-day life of individuals to future, long-term decisions. Secondly, it uses a series of analytical tools to answer the research questions, innovative econometric models, transport simulation and an in-house developed interactive decision-making tool. It is a spherical exploration of the available analytical tools, each of which used provides the specific insight for which it was used. Additionally, the case study that is conducted in an insular, island area provides insight into the behavior, choices and particularities of an area that smaller scale, smoother interventions may be more successful than abrupt, sudden changes. The lifestyle of the study area plays a significant role in the conducted analysis. Findings from this analysis contribute to the transferability of models. Finally, the paper provides useful insight into various policy measures that should be considered for changing the human behavior, attracting more citizens to using sustainable means of transport and improving the standard of living while minimizing the external cost of transportation.

The developed tool, policy platform, is an interactive resource that compares the different scenarios and policy measures based on a series of key performance indicators such as passenger kilometers, daily emissions from transports, fuel cost. It also presents interactive maps of the study area, presenting and evaluating the effect of each scenario in traffic volumes. Also, it allows the user to interactively react to scenario results and to test different specifications of variables, such as socio-demographic variation and adjusting the effect of latent variables such as environmental consciousness and the exuberant use of motorized transport.

Results indicate that the hypothesis that there is a distinct set of underlying rules that govern an individual's decisions, what we call lifestyle, that is closely affected but not exclusively dictated by the geographical location of their residence. This statement has direct policy implications. Policy makers should consider the particularities and uniqueness of a case study area before transferring or applying successful policy measures. Also, different scenarios yield different measurable results. The adoption of alternative fueled vehicles, in an unstable macroeconomic environment cannot exceed the positive effects of the implementation of measures towards the promotion of active transport, even in the most optimistic scenarios.