Exploring MaaS Adoption in a Car-Oriented City: Dynamic Stated-Preference Insights from Naples

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INTRODUCTION & AIM

The city of Naples, Southern Italy, is characterized by the combination of high mobility demand, heavy car dependency, congestion, and critical air quality levels. In such a context, a MaaS proposal only makes sense if it can demonstrate its capabilities in shifting travel to lower-energy and emission modes. The work presents an iOS app for conducting dynamic stated preference surveys that i) reconstruct travel diaries; ii) estimate mobility budgets, and iii) guide users in configuring tailored MaaS packages. The goal is to produce micro-behavioral data that allows for the simulation of MaaS adoption scenarios and the quantification of the corresponding benefits in terms of energy and emissions in a car-dependent and environmentally stressed cities, Naples among them.

METHOD

I designed the survey and developed an app in Swift. The SW tool combines a generic part, which manages the interview flow and data storage, and a local part, which incorporates Naples' rates and offerings. The *plug and play* architecture makes the tool easily adaptable to other urban contexts. The questionnaire first asks to users for socio-demographic and daily travel patterns, then calculates the actual monthly cost of mobility, including fixed (and varible) travel components that are often ignored. Finally, it proposes a MaaS package consistent with preferences and budget and allows the user to customize the MaaS package to meet her/his specific needs. Finally, tripchain is reassigned using only the chosen modes.
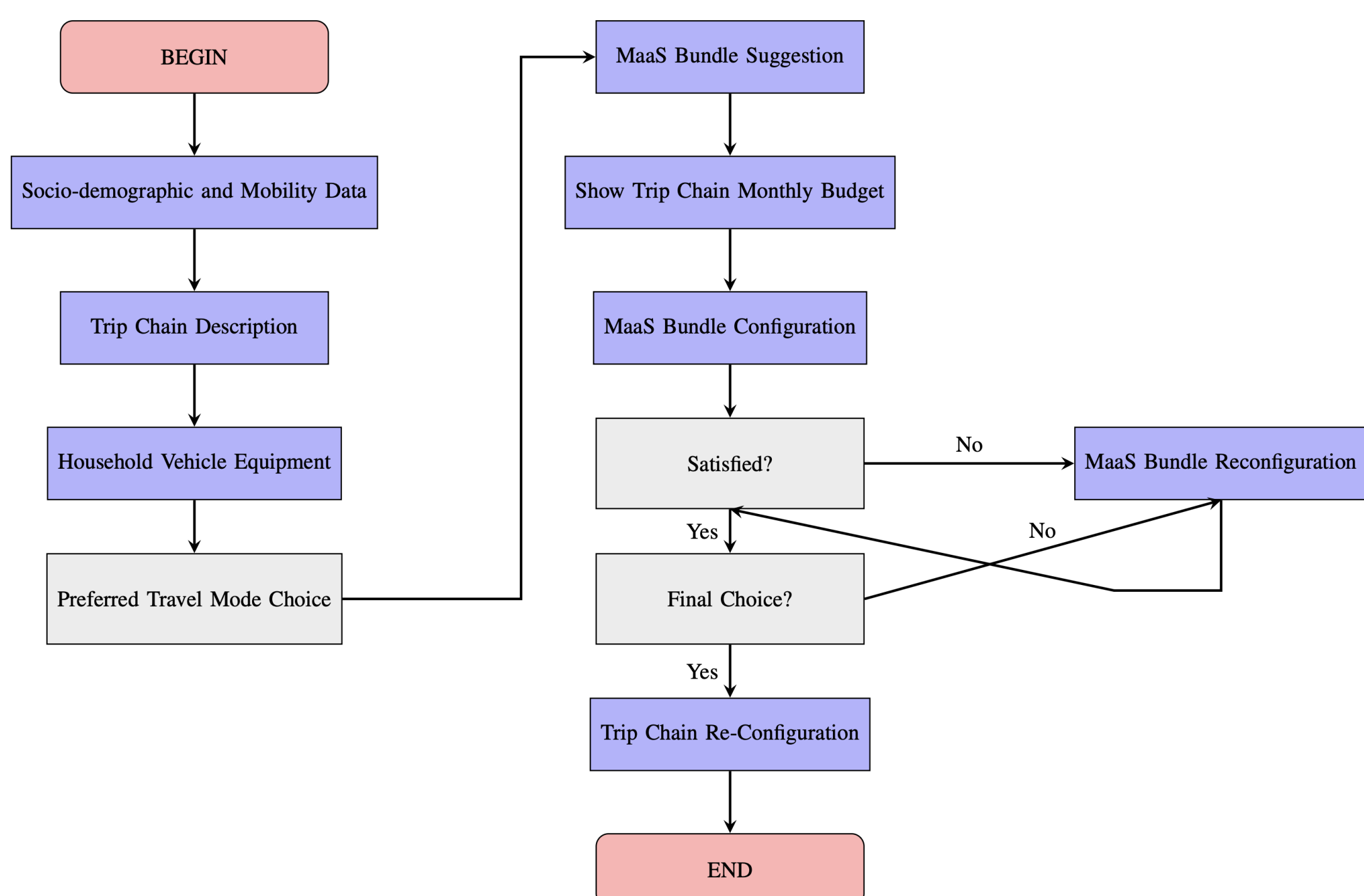
RESULTS & DISCUSSION

The empirical evidence shows that respondents converged on MaaS packages whose cost is almost overlapping with their current monthly mobility expenditure. The distribution of subscribed-package costs is centred around 84€ in the interval 80-90 €, close to the interval highlighted by the distribution of observed mobility costs, which confirms that the interview logic succeeded in keeping the solution inside a familiar spending range. This is crucial for the environmental reading of the study, because it proves that a shift towards more energy-efficient modes can be proposed without asking users to pay more.
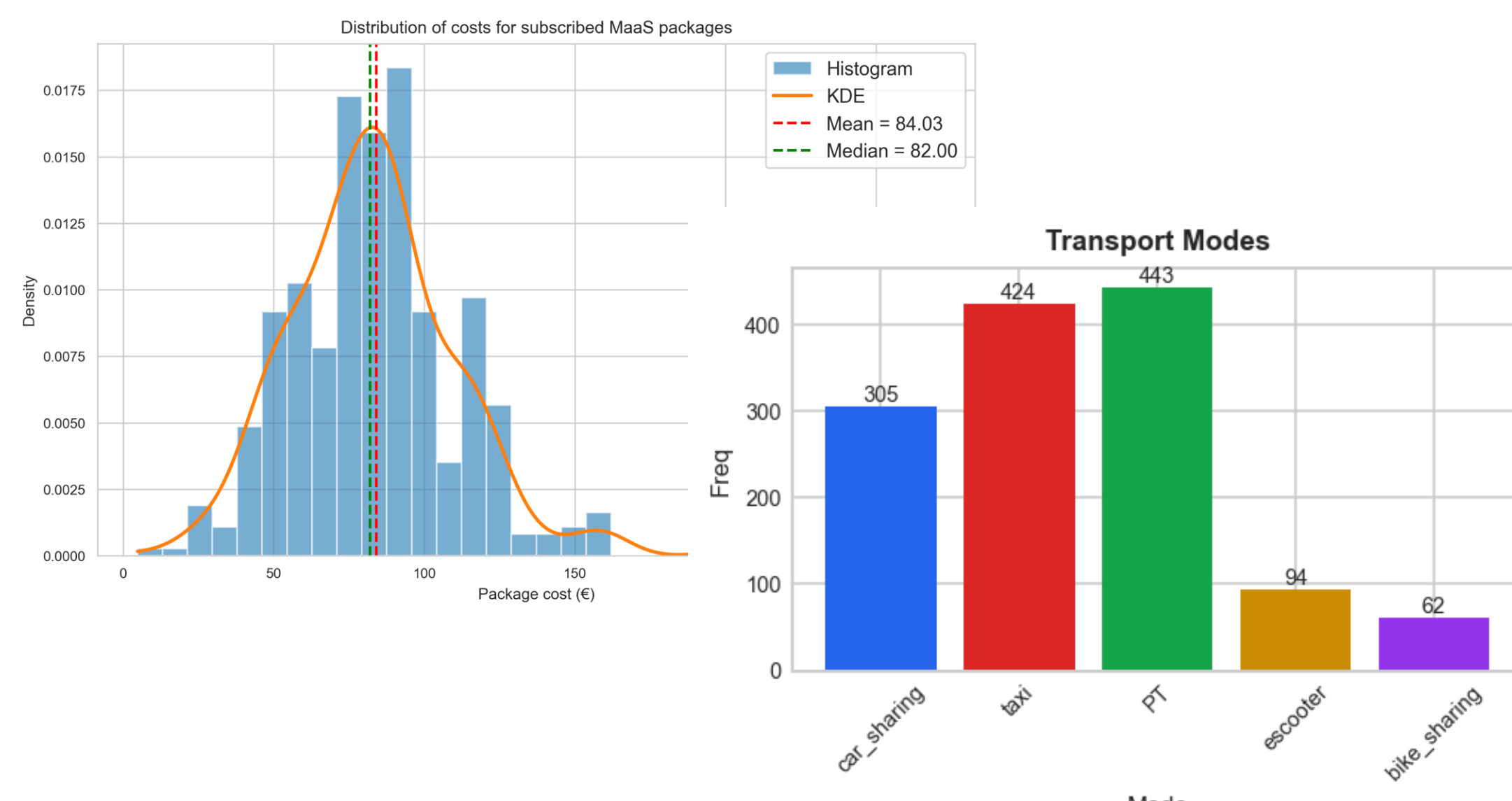
At the same time, the composition of the configured packages shows a systematic presence of public transport and shared services, i.e. modes with lower specific emissions than private car use in the Naples context. Since the tool preserves the original trip-chain structure and forces the re-allocation of legs using only the purchased modes, every individual record can be translated into "before/after MaaS" energy or CO_2 estimates. In other words, the data confirm that the dynamic procedure does not just elicit a preference, but produces operational mobility scenarios that can be taken over by demand models or microsimulations.

CONCLUSION

The fieldwork demonstrates that it is possible, even in a car-dependent, to develop a research pathway that leads users to choose MaaS packages that are economically sustainable and, for this very reason, potentially effective from an environmental point of view. The alignment between real cost and package cost is the key result: *it means that environmental benefits do not depend on the assumption of an "ideal user willing to pay more," but on a redesign of the expenditure that users already incur.*

FUTURE WORK / REFERENCES

Having for each respondent an observed diary, a budget, a configured package, and a reconfigured diary makes the dataset immediately integrable into demand models and/or microsimulations , potentially leading at estimating energy consumption and avoided emissions.