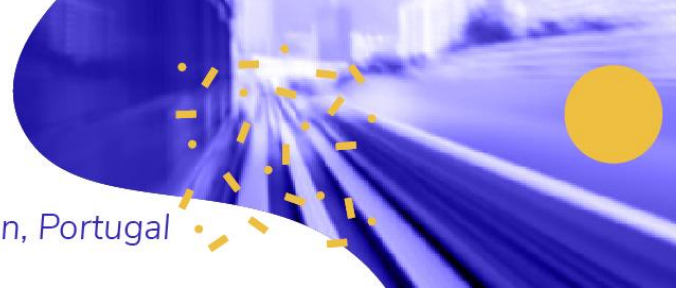




# MOVING TOGETHER

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## nuMIDAS: Addressing new mobility policymaking challenges

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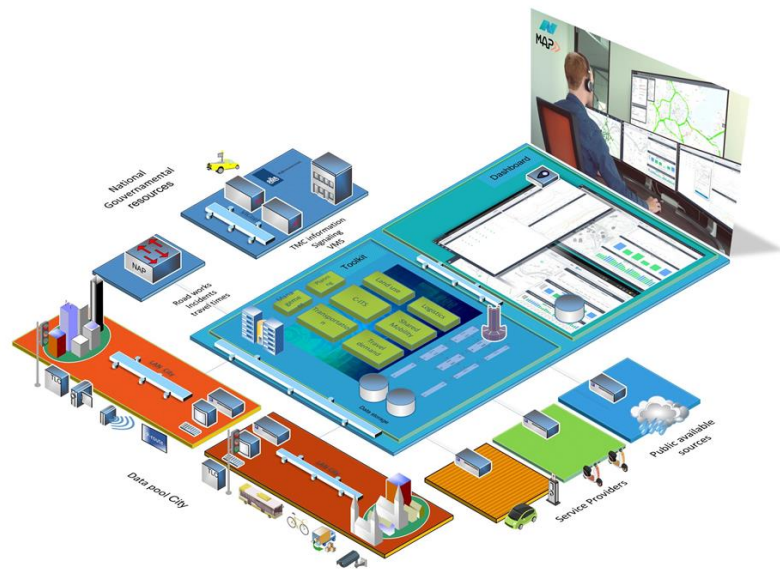
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### 1. Overview and motivation

The mobility ecosystem is on the edge of a new era where connected and automated vehicles are emerging, connected apps for travellers become more and more available, organisations rally to establish new forms of shared mobility, and on top of that, new concepts of co-creation evolve within new business models driven by cooperation with new players in the mobility market. This rapidly changing ecosystem appears within cities and regions, and will have effects on the public space, the environment, the inclusiveness of society, etc. It will thereby affect the liveability of cities and regions. New ways of data generation, collection and storage evolve with new forms of mobility and techniques. As such, (big) data generation analysis techniques like machine learning become more paramount and give more insight into the mobility needs of citizens and the performance and impact of (new) mobility solutions.

Integrating these disruptive solutions and technologies into coherent planning, decision making, and policy making for mobility is a huge challenge at current. The nuMIDAS project creates a tangible and readily available toolkit (architectural view in figure 1) to support local governments and bridge this gap by providing a comprehensive approach regarding what datasets, methodologies, tools, and models are required and which existing ones can be adapted. Moreover, nuMIDAS makes policy decisions measurable and quantifiable, and impact assessments more tangible and directly usable. By applying research and implementing the tools in pilot cities with varying problems and characteristics, wider applicability across Europe is guaranteed.



*Figure 1: Schematic view of the architecture of the nuMIDAS toolkit*

### 2. Methodology, results and main contributions

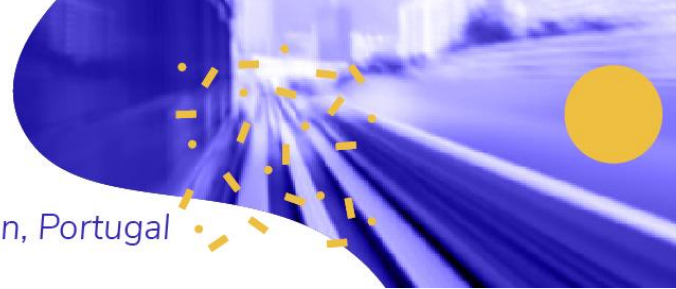
The prototype development approach is driven by (market) research, quantitative modelling, and stakeholder involvement, taking into account the various business models behind new mobility propositions. All our research is validated through an iterative approach within six smart mobility case studies (selected out of twelve) in four European cities (Barcelona, Milan, Leuven, and Thessaloniki), where a toolkit is assembled that can be broadly deployed. Advanced methods and tools are required to analyse, assess, and monitor these new mobility solutions and policies including new data management techniques. The toolkit (in the form of a dashboard) incorporates

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these methods and tools providing researchers, planners, and policymakers a visualisation of the results through a GUI. A broader uptake of the toolkit by other cities is guaranteed by drafting up transferability guidelines.

### 3. Example case study: Milan

In the case of Milan, the policy maker required a tool for the preplanning of shared mobility services. The nuMIDAS team is designing and developing a tool that processes available data to produce the output required by Milan city mobility planners. The aim is to produce a tool replicable and scalable in different cities/regions in Europe.

In the case of station-based car-sharing, as an example, the dashboard will suggest the proper location of new car-sharing stations and a well-balanced car fleet. This outcome will be produced by backend algorithms that will elaborate data provided by the municipality, according to the process in figure 2.

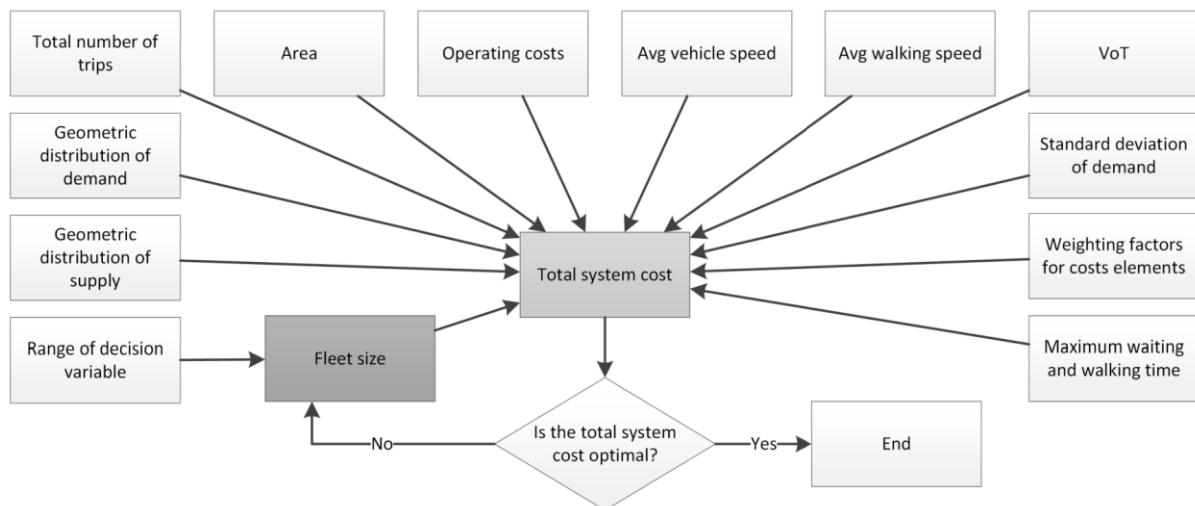


Figure 2: process of calculating the total system cost optimal

New car-sharing services, or extensions of the existing ones, can then be planned based on the outcomes of the nuMIDAS tool. The dashboard allows tuning parameters of the algorithms to compare different scenarios, depending on the weight given to conflicting objectives. Examples of the latter are the increase of shared mobility options to citizens in low-demand areas, and the economic sustainability of car-sharing operators.

The policy maker will use the dashboard to link data sources and input parameters, and to visualise the results of the computation in a user-friendly environment.

This specific example will be tested in the case of Milan, but will then be extended to be used by any European city willing to make use of a tool that supports car-sharing planning.

### 4. Conclusion and future works

With the pilot cities fully involved in the nuMIDAS project, the aim is to develop our toolkit reaching at least technology readiness level 6 or 7. *Around the time of the (possible) submission of the paper, the framework is already in place, so the first results will be reported in the paper.*

### References

<https://www.numidas.eu/>

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