

The role of data in sustainable urban mobility policy

Citation for published version (APA):

Liu, X. (2023). *The role of data in sustainable urban mobility policy*. [Doctoral Thesis, Maastricht University]. Maastricht University. <https://doi.org/10.26481/dis.20231127xl>

Document status and date:

Published: 01/01/2023

DOI:

[10.26481/dis.20231127xl](https://doi.org/10.26481/dis.20231127xl)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

www.umlib.nl/taverne-license

Take down policy

If you believe that this document breaches copyright please contact us at:

repository@maastrichtuniversity.nl

providing details and we will investigate your claim.

Scientific and Social Impacts

This thesis studies the current role of (big) data in sustainable urban mobility policymaking and explores how data could be more effectively used in this process. The (potential) implications of this research for science and society are discussed in this section.

Scientific contribution

The scientific contribution relates to the research field of sustainable urban mobility transformation and more specifically the knowledge about data use in urban mobility policymaking. Current scientific literature offers limited insight in and had little engagement with the role of data in urban mobility practice. It has mainly focused on developing decision support models for policy decisions about (bigger) investment in urban transport, especially infrastructure (Curtis et al., 2019). Those are less useful for urban policymakers that want to monitor and evaluate policy to steer towards sustainable mobility (Banister and Hickman, 2013). This PhD study gives a better insight in the role of data in current policy practice and it offers suggestions on how data can be used more effectively by urban policymakers that seek to promote sustainable mobility. The analysis of multi-level governance conflicts sheds light on the complex relations among different governance layers in sustainable urban mobility transitions, which addresses the gap in understanding of the urban mobility multilevel policy mix. By identifying conflicts and proposing strategies to address them, this study adds nuance to the understanding of governance dynamics in mobility policymaking. Better data use for policy monitoring concerns the short-term policy cycle, and our findings suggest that a combination of big data and survey data (that can give more insight into why people travel as they do) is most instrumental. This is in line with earlier studies that argue to not only rely on quantitative data but also incorporate other forms of knowledge. Chapter 3 and 4 also specify how different types of data are used in the sustainable urban mobility policymaking process by distinguishing the long- and short-term policy cycle. This adds to Verstraete et al. (2021) who shed light on how to use data in the different steps of the policy cycle by emphasizing what approaches could be used to analyze data in each of the steps, based on both scientific literature review and practical case studies (Verstraete et al., 2021). Their work, which was part of EU project PoliVisu (<https://www.polivisu.eu/>) (Concilio et al., 2021), also found that limited data literacy is the key constraint to successful use of data in urban policymaking, but they did not highlight the distinct role of data in the short- and long-term policy cycle (chapter 4).

Social contribution

The main societal contribution of the work presented in this thesis relates to its value for application in sustainable urban mobility policymaking practice by municipal decision makers, urban spatial planners, and developers of decision support tools. The identification of barriers and opportunities in data utilization offers practical insights for policymakers. The emphasis on multi-level collaboration underscores the importance of institutionalizing multi-level co-development. The recognition of the value of different types of data in mobility policy assessments (chapter 3) shows the state of the art to the policymakers, assisting them to better understand which type of data is suited in which policymaking steps. The case study of the two Dutch cities, Maastricht and Groningen (chapter 4), provides practical 160 examples of data-driven policymaking. Insights can be derived from this research on how data can be better embedded in policymaking practice, such as

providing more opportunities for local governments to do ex-post policy assessments, more data knowledge needed for data selection and processing, and setting a common indicator for the data analysis. Moreover, the distinction between long-term and short-term policy cycles, and the importance of national/regional support, highlight actionable strategies for municipalities aiming to integrate data into their decision-making processes. In order to ensure a good match between model options and mobility policymakers needs, a survey was conducted in this research to investigate the current application of GIS models in urban mobility planning practice in Europe as well as model data availability and the needs and priorities of European mobility planners regarding GIS models. It provides guideline for modelers to develop traffic models based on the mobility policymakers' needs as well as the insights in how the model should be tailored in different circumstances.