

Sustainable Urban Mobility Planning: The Role of Monitoring and Evaluation

Abstract

Sustainable urban mobility is an established target of policy making and planning in Europe. It is associated with, among others, better air quality, less noise disturbance, increased safety and the quality of public space. In this regard, one of the EU Commission's main tools to reach sustainable urban mobility, the Sustainable Urban Mobility Plans (SUMP), require the explicit integration of Monitoring and Evaluation (M&E). Yet, European cities face common barriers when it comes to materialising M&E in practice. To avoid or overcome these barriers, this paper argues for a feasibility approach to M&E of sustainable urban mobility measures. We draw this conclusion on the basis of process as well as impact evaluation data from measures transforming car-oriented neighbourhoods into children-friendly neighbourhoods in seven European cities collected during the Horizon 2020-project Metamorphosis. We then give advice on how to design and integrate a feasible M&E scheme.

1. Introduction

Sustainable urban mobility is an established target of policy making and planning in Europe. It is associated with, among others, better air quality, less noise disturbance, increased safety and the quality of public space (EU 2013). Factors that become increasingly important, since an ever-growing share of people worldwide and in Europe live in cities (Koceva et al. 2016). Reaching the target of sustainable urban mobility asks for target-oriented policymaking and planning and thus requires appropriate measures, successfully implemented at the right leverage points in the socio-technical system of urban transportation. A sentence that gives rise to questions such as: what is an appropriate measure? When has an implementation been successful? Where are the right leverage points? Answers can only be given if the impact of implemented measures is being monitored and evaluated against a scale derived from the target of sustainable urban mobility.

The need for monitoring and evaluation (M&E) to secure and measure the success of an implementation as well as to build up knowledge for successive implementations gets increasing awareness from stakeholders of the sustainable mobility transition. While renown urban planners promote and apply M&E since decades (Gehl 1994), science still feels the need to argue that *Evaluation matters* (Dziekan et al. 2013).

However, major cities have already begun to establish M&E methods in their planning guidelines (Transport of London 2010). At the same time policymakers increasingly highlight the importance of M&E in policy documents. In this regard, one of the EU Commission's main tools to reach sustainable urban mobility, the Sustainable Urban Mobility Plans (SUMP), require the explicit integration of M&E (EU 2013; Gühnemann 2016; Wefering et al. 2014). While this integration extends the potential of M&E to improve processes and increase impacts of sustainable urban mobility planning, it could also be regarded as a new prerequisite for future funding of sustainable urban mobility planning projects.

Nevertheless, differences between an aspired ideal of M&E and the planning reality exist (Rammert 2017). European cities face common barriers when it comes to materialising M&E in practice. Gühnemann (2016), describes attitudinal (related to the perceptions and expectations of decision-makers and stakeholders), institutional (occurring in the co-operation between governmental institutions as well as between government and the private sector), financial (due to a lack of money or staff resources) and technological barriers (insufficient tools, techniques and technologies to support the planning process) as these typical barriers that generally occur in addition to a lack of experience and technical know-how.

To avoid or overcome these barriers, this paper argues for a feasibility approach to M&E of sustainable urban mobility measures. The advantages of M&E can only be harvested if M&E are realisable within the constraints of administration, legislation and resources. We draw this conclusion on the basis of process as well as impact evaluation data from measures transforming car-oriented neighbourhoods into children-friendly neighbourhoods in seven European cities collected during the Horizon 2020-project Metamorphosis. From a scientific perspective, Metamorphosis provides a set of examples for the implementation and the effect of M&E. This set of examples is not representative for EU cities or for the measures under consideration, but it can give valuable insights into the benefits of and the barriers to M&E as well as ways to overcome the latter.

Before discussing our conclusion in detail and giving recommendations to stakeholders involved in sustainable urban mobility planning, the following two chapters will introduce M&E as a method and give a portrait of the Metamorphosis project.

2. M&E in Theory

Evaluation may be defined as a systematic and objective assessment of an ongoing or completed measure, including the costs, time and outputs. For anyone carrying out projects, it is important to know and to be able to show that the effort and the costs invested are justified. In addition, evaluation can help to improve measures during the implementation phase, e.g. to refine the method and/or if it is foreseen that the objectives of the measure which has been defined may be missed. This way, processes can be optimised during the project, and occurred mistakes can be avoided in the future (Dziekan et al. 2013). It is therefore important to evaluate both the impact and the process involved for a particular measure.

When conducting an impact evaluation, the identification of objectives, the selection of indicators and methods have to be done before the implementation phase of the measure evaluated (figure 1). It is particularly important to analyse the data collected before the implementation (ex-ante) to adjust the measure according to the expected findings of the results. The results of the evaluation should be communicated effectively: a clear and understandable communication of data and results is important to increase the understanding of the impact of mobility actions. Data and results should therefore be visualised and presented in a concise and understandable form (Dziekan et al. 2013; Gühnemann 2016).

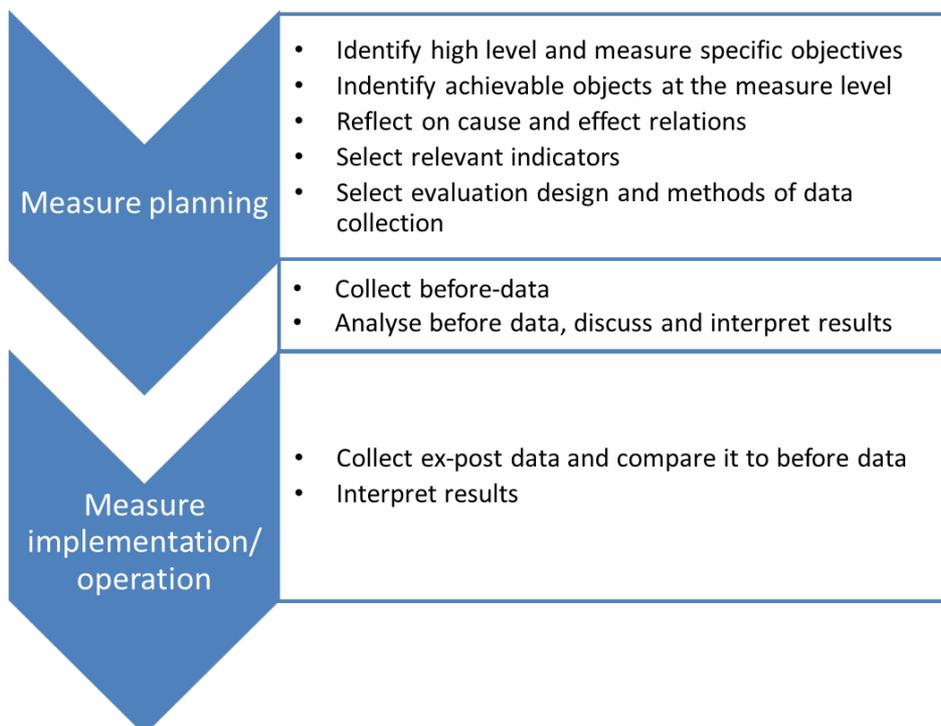


Figure 1: Steps for impact evaluation (Source: Dziekan et al. 2013)

The success of measures is not only influenced by the impacts of the implemented measures but also by optimising the process of preparation and implementation. In this sense, a good process evaluation helps to make processes more efficient and to avoid making the same mistakes again. The focus of process evaluation is on how an outcome is produced, rather than the measurement of the impacts. (Dziekan et al. 2013; van Rooijen and Nesterova 2013). Van Rooijen and Nesterova (2013) recommend a process evaluation approach that is linked with the typical phases of a measure and divided into three periods: the planning, preparation and design phase, the implementation (construction) phase and the operation phase. The process evaluation should give feedback to

- general administrative information at the end of the preparation phase,
- general content information including the definition of the objectives, and
- content-reporting with information and statements concerning barriers, drivers, success and failure.

The evaluation procedure for Metamorphosis follows these recommendations. In addition, it is inspired by three established, mobility specific evaluation approaches that underpin and support our approach:

- MaxSumo approach, an evaluation method for planning, monitoring and evaluating mobility management projects (European Platform on Mobility Management 2017),
- The M&E template of the European project CH4ALLENGE to support mobility practitioners in improving local transport planning processes (Gühnemann 2016), and
- SATELLITE, the refined CIVITAS process and impact evaluation framework (van Rooijen and Nesterova 2013).

3. Monitoring and Evaluation in Metamorphosis

Metamorphosis is an EU-funded project with the goal to transform car-oriented neighbourhoods into children-friendly urban environments, achieve mobility behavioural changes and increase the quality of life. Since a sustainable neighbourhood implicates the involvement of the next generations, the project has its main focus on children. The unique and innovative approach of Metamorphosis is to make children important players and value their input during all project phases. They actively

contribute during the planning and implementation of children-friendly mobility solutions, the data collection and data analysis, the evaluation process and the dissemination of the results. This gives the opportunity to analyse the problems through children's eyes and develop appropriate measures aimed at a transformation towards sustainable urban mobility.

Metamorphosis includes trial implementations in seven European cities. The cities participate with up to four different neighbourhoods, selected to have a wide variety in size, structure, density and diversity. Each city is being accompanied by a research and consultancy partner. The measures the seven cities plan are expected to lead from temporary activities to permanent implementations and can be classified in the following areas (activity fields):

- interventions in public space (e.g. street closures, transformations of parking spots, hybrid zones)
- crystallisation points (urban gardening projects and mobility share points)
- empowerment for active mobility (workshops and trainings)
- educational innovation tools or support tool (educational material, apps, games, etc.).
- In addition, improvement of planning procedures and integration of know-how and successful activities into the local SUMP.

Within Metamorphosis, there is one partner evaluating the whole project (impact and process) and providing support to the city partners over time. In the case of Metamorphosis, impact evaluation deals with understanding of the practical and technical effects of measures, whereas process evaluation is concerned with understanding more clearly why measures have succeeded or failed.

Based on a template provided, each city developed implementation plans for all their measures. The plans report information on the goals and targets, the steps planned to implement the measure, the most appropriate indicators, units and methods for collecting data (at best carried out before, during and after the implementation date; figure 2).

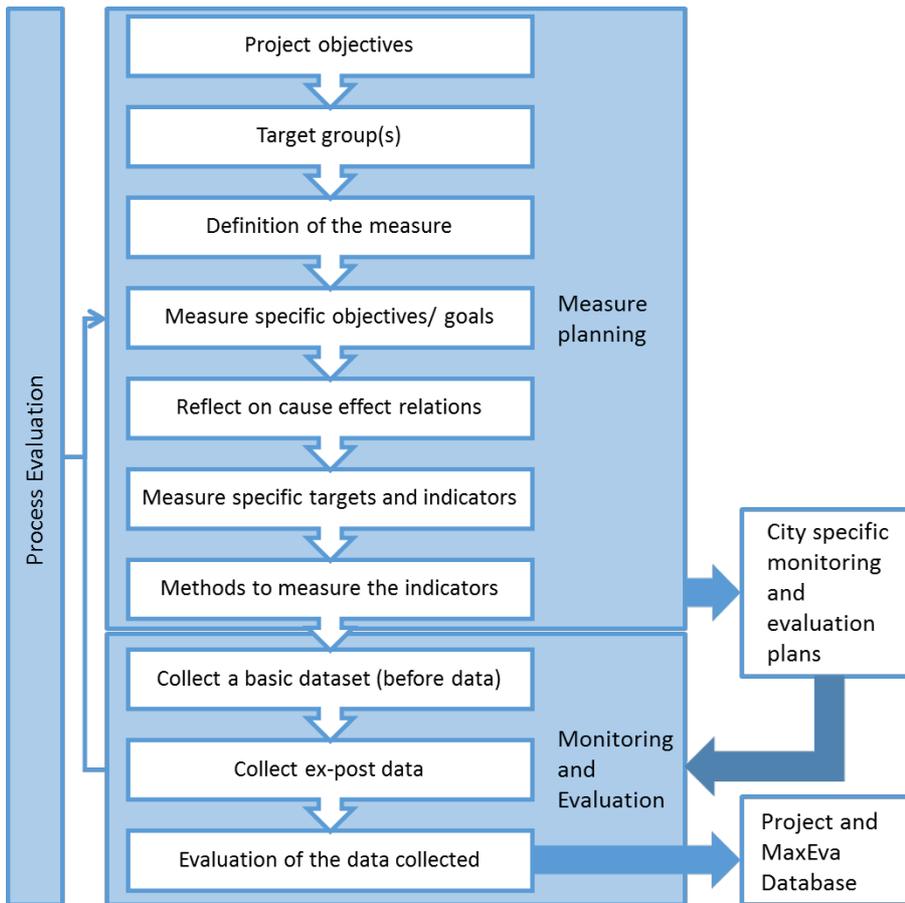


Figure 2: Metamorphosis evaluation method (based on European Platform on Mobility Management 2017)

The impact of the measures is assessed through the measurement of specific indicators, provided by the TUD in a first general evaluation plan created during the first phase of Metamorphosis. These indicators represent a reference for all the city partners to prepare their measure-specific implementation plans and are classified in two main groups: key Metamorphosis indicators and measure-specific indicators. The key Metamorphosis indicators are suitable for every measure and include key neighbourhood demography and mobility data (size of the neighbourhood, number, age and modal split of inhabitants) and key project data (resources, level of satisfaction/ acceptance of the measure, number of participants of the offered services, modal split of the participants). They also allow monitoring the attitude of the inhabitants during the process and a comparison between the partner cities. The second main group meets the specific measures and includes the following set of indicators:

usage and safety of public spaces	people and children moving lingering in public spaces safety and security in public spaces traffic conflicts
perception of public spaces	greenery landscape, attractiveness of the urban design local identity air and noise pollution cleanliness
specific mobility habits	modal split of the home-to-school trips waiting times
accessibility and infrastructures	accessibility connectivity surfaces to walk and cycle traffic speed

For each indicator it was suggested a unit and methods to measure them (e.g. observation/ counting, interviews, questionnaire surveys, workshops, etc.). The selection of these indicators by TUD takes into account the easiness to measure and communicate them, the data availability and the feasibility of collecting the appropriate data. As children claim a key role in Metamorphosis, these methods are especially selected and designed to be applicable for kids. In the Metamorphosis evaluation process the aim is to integrate children as critical and honest judges. As children are known for their ability to question everything it helps to analyse their needs, habits or routines. Furthermore, implementing innovative or radical measures is easier when they reflect the wishes and desires of children, since adults act more frequently on children's requests than on those of other adults.

In addition to the impact evaluation, a process evaluation is carried out in order to monitor every single step of the project, understand why measures succeed or fail and solve arising problems. Process evaluation involves the evaluation of the process of preparation and implementation of the measures, including the roles of information, communication and participation. It provides insights into organizational and administrative factors, and looks at the phases of the process and not necessarily at the output. Process evaluation is more qualitative than quantitative and has the aim to extract lessons learnt from the cities that will be helpful for future activities, and help to recognize similar obstacles before they become a problem. The results of the process evaluation are collected by the TUD via biannual online questionnaires, with questions

focusing on the implementation and operation phase respectively. Furthermore, workshops organised during project meetings help to identify further barriers and drivers. Feedbacks on the results of the questionnaires are also given periodically at the project meetings and telephone conferences with the cities.

4. Experiences and Conclusions

The preliminary results of our M&E research lead to some valuable insights regarding the process of implementing measures for a sustainable urban mobility. While some implementations suffered from administrative and legal barriers, the internal organisation within the city teams as well as between the cities and their respective consultants emerged as an important driver of success. The main driver, however, occurred to be cooperation and communication between the Metamorphosis teams and local stakeholders. Being able to communicate the planned process of implementation and the expected impact of a measure to harness political support was particularly relevant. These drivers and barriers to successful measures for sustainable urban mobility highlight the importance of feasibility. Measures and their implementation, no matter how specific, measurable or replicable they are, need to be feasible to become a success. In other words: keep it simple and stupid.

This is particularly true for the implementation of M&E in sustainable urban mobility planning and boils down to the following general criteria for designing M&E reported according to their importance for success:

1. Assess your resources (e.g. staff, time, finances, network) in order to estimate your space of action prior to drafting your M&E-plan. Pay special attention to the potential barriers for implementation mentioned above: administrative, legal, communicative, political support.
2. According to your self-assessment: Limit the number of indicators you plan to assess to an achievable minimum that is still sufficient. This could well be only one indicator.
3. According to your self-assessment: Keep the indicator(s) simple to allow for efficient communication inside and between teams as well as beyond, in order to secure cooperation and political support.
4. Now, ensure you follow the other established design guidelines for M&E-indicators by Dziekan et al. (2013):

- they must allow the attribution of the measured performance or impact to your measure.
- they must match the objectives of your measure.
- they must be measurable with the available measurement tools.

Promoting these criteria, we do not advocate for a completely new method to design M&E projects. However, we shift the priorities within established design rules such as the SMART (specific, measurable, achievable, replicable, time bound) or ROAR-approach (relevant, objective, available, realistic, specific) from equal-weight-to-all-criteria to priority-of-feasibility (*achievable* respective *realistic*, within the established approaches).

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