

mobil.TUM 2024 – The Future of Mobility and Urban Space, April 10-12, 2024

## Comprehensive traffic calming methodology and impacts: findings from a small municipality in Slovenia

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Keywords: *Sustainable urban mobility planning, Comprehensive traffic calming, Methodology, Link and place matrix, Travel behaviour, Monitoring, Evaluation*

This work addresses the following topic(s) from the Call for Contributions:  
(Please check at least one box)

- Placemaking to integrate urban spaces and mobility
- Promoting sustainable mobility choices in metropolitan regions
- Governing responsible mobility innovations
- Shaping the transition towards mobility justice
- System analysis, design, and evaluation
- other: \_\_\_\_\_

### Extended Abstract

From here 700-1000 words, grouped by the following sections:

#### Problem statement

In recent decades, the transport system has been characterized by a constant increase in the volume of car traffic (Goodwin et al., 2012). Initially, the positive effects of motorization on the economy and society (Freudendal-Pedersen et al., 2019) were soon overshadowed by the negative effects of traffic, such as congestion, noise, pollutant and greenhouse gas emissions, energy consumption, social problems, a large share of space dedicated to personal automobile traffic, rapid urban growth and suburban sprawl (Freudendal-Pedersen, 2009; Freudendal-Pedersen et al., 2019; Holden et al., 2019; Marshall, 2001; Næss and Vogel, 2012). The current intensive use of the car has also been proven to harm people's physical and psychological health, deteriorate the living environment, increase the likelihood of traffic accidents, and reduce opportunities for social interaction (Appleyard, 1981; EC, 2016, 2013, 2011, 2009; ETSC, 2022; Litman, 2017; Plevnik, 2016; Welle et al., 2015; WHO, 2022, 2018).

Thus, reducing the increasingly negative impacts of motorised traffic is today an important element of policies in various sectors, and especially in transport, environmental and health sector. The new focus of transport and related policies has led to a transformation of strategic transport planning practice, which in most of Europe, as well as in some other parts of the world, is already represented by sustainable urban mobility planning. One of its most important strategic guiding principles is comprehensive traffic calming. The latter is a planning approach for reducing the negative impacts of motor traffic in (parts of) cities endorsing traditional traffic calming measures (i.e. reducing the speed and volume of motor traffic) while also bringing about a significant improvement of conditions for its alternatives with a focus on active mobility, and comprehensive redesign open public space as a broader context to traffic infrastructure. It is also focused on the user instead of a vehicle.

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While the practice of sustainable urban mobility planning is already well established in much of Europe, comprehensive traffic calming is not yet a widely established and widespread practice. Its effects are not yet well researched, nor is its role and potential for development in the framework of sustainable urban mobility planning. Comprehensive traffic calming therefore requires further support and research to provide arguments for its implementation, particularly in the context of smaller towns and in southern and eastern Europe, where this research was undertaken.

### **Research objectives**

Focusing on traffic calming, the specific research objective was to address the above-mentioned gaps in the field of planning, monitoring, and evaluation of traffic calming in three ways. Firstly, to place comprehensive traffic calming within the framework of sustainable urban mobility planning. Secondly, to monitor and confirm the positive impact of comprehensive traffic calming on active mobility, quality of living environment and traffic safety, and consequently on travel behaviour change away from private cars. And thirdly, to develop a new planning and decision-making support system (methodology) for comprehensive traffic calming and test it in practice.

### **Methodological approach**

Because it is orientated towards the same vision and targets, the development of the comprehensive traffic calming methodology was based on the methodology for sustainable urban mobility planning. Furthermore, following the specific aims to further prioritize active modes, provide an in-depth understanding of traffic safety as well as justify and support the implementation of an interdisciplinary design of open public and street space by transport and spatial planners, in a methodological sense, the theoretical starting points of the research were New traffic safety paradigm (Litman, 2020, 2017) and the Link and place theory (Jones et al., 2008, 2007).

### **Results**

The research resulted in a new planning and decision-making support system (methodology) to design, monitor and evaluate the impacts of comprehensive traffic calming. It consists of seven consecutive process steps that are based on the sustainable urban mobility planning methodology and include a new version of the link and place matrix for comprehensive traffic calming. The latter puts the integration of transport and spatial planning at the forefront of planning for comprehensive traffic calming as well as enhancing the status of public open spaces and segregated green connections for active mobility. The methodology's applicability was further increased with a practical implementation (test) during the development process in the town of Ljutomer (population 3.400) in eastern Slovenia where a neighbourhood was redesigned following the comprehensive traffic calming principles. Redesign impact data was monitored during the course 8 years (1 year before, 1-3 years after and 6 years after) and with a broad range of indicators. On the one hand, the research results support the typically expected impacts of traffic calming (reduction of speed and volume of motorised traffic and improvement in traffic safety). On the other hand, the research results revealed and confirmed additional impacts that are not traditionally monitored. These are priority treatment of pedestrians and cyclists, the improvement in perceived traffic safety and in perceived conditions for active mobility among users, the increase in the use of active mobility, the improvement in user satisfaction with the living environment, the high perceived effectiveness and acceptability of the interventions implemented, and the increase in the amount and use of public open space, including the increase in the extent of green spaces.

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