TEACHING MATERIAL GUIDANCE

1) Title of the material

Nikiforiadis, A.; Basbas, S.; Mikiki, F.; Oikonomou, A.; Polymeroudi, E. Pedestrians-Cyclists Shared Spaces Level of Service: Comparison of Methodologies and Critical Discussion. Sustainability 2021, 13, 361. https://doi.org/10.3390/su13010361.

https://www.mdpi.com/2071-1050/13/1/361

2) Which section of the SUMP it is relevant to?

In this paper, the authors presented different methodologies for calculating Level of Service (LOS) on sections of paths shared by pedestrians and cyclists and applied some of them to calculations on two spaces shared by pedestrians and cyclists in a medium-sized city in Greece. The results of the methodologies were compared both among themselves and concerning the opinions of users who took part in a survey. Therefore, the article can be linked to the **third, fourth, fifth, sixth and eleventh** sections of the SUMP circle related respectively to the determination of planning framework, analysis of the mobility situation (in particular the analysis of problems and opportunities for all modes of transport - **subsection 3.2**.), scenario building and joint evaluation (development of scenarios of possible futures - subsection 4.1.), vision and strategy development (arguments for stakeholders – subsection 5.1), setting targets and indicators (setting indicators for all targets - **subsection 6.1.**) and monitor progress and adapt – **subsection 11.1.**

3) Which Mobility Manager knowledge this material is the most relevant to?

It is related to Transport and mobility planning (section 1 of the Mobility Manager competencies) especially 1e (evaluation of transport measures) and also to section 5 Data analysis for mobility planning especially 1a (data collection and analysis).

4) Problem approached and content overview

Problem approach – general understanding of the methods which support the planning of shared spaces for pedestrians and cyclists. This paper aims to present different methodologies for calculating LOS for pedestrians, LOS for bicycles and LOS for pedestrian and cyclist shared space, as well as to discuss their advantages and disadvantages and to lay the foundation for future research in this field. Furthermore, the paper examines the suitability of different categories of methods for the assessment of pedestrian and cyclist shared space. Consequently, the paper aims to help not only researchers but also practitioners who are responsible for the assessment and design of shared walkways or streets for pedestrians and cyclists. Supporting the evaluation of shared spaces for pedestrians and cyclists will enhance the sustainability of urban transport systems, as the design and management of this infrastructure will be implemented more efficiently, and as a result walking and cycling, which offer significant environmental, economic and social benefits, will become more preferred mobility options. The paper presents a literature

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review on the estimation of pedestrian LOS (based on Point System Techniques, based on Statistical Modelling Techniques and based on Conjoint Analysis), bicycle LOS (based on Point System Techniques and based on Statistical Modelling Techniques) as well as pedestrians-cyclists shared space LOS. The paper presents a discussion on LOS in pedestrian and cyclist shared spaces and the different existing methodologies. To facilitate the discussion around the different methodologies, it was considered appropriate to select and apply some of them to two pedestrian and cycling shared spaces with different characteristics (both operational and geometric). The criteria for the selection of methodologies were: (a) popularity, (b) ease of use, (c) inclusion of both quantitative and qualitative methodologies, and (d) inclusion of methodologies that are based on the perspective of pedestrians, cyclists and both users. The study area of the research is located in a typical medium-sized city of Northern Greece, Serres. To mitigate impacts of motorized transport dominance, local authorities, which is mainly the Municipality of Serres, has undertaken a Sustainable Urban Development Strategy, in line with European guidelines, achieving receipt of considerable relevant European and national funding. The most recent Sustainable Urban Mobility Plan of the city included a methodological approach comprising a comprehensive "before and after" study that considers the impact of traffic calming measures on traffic flows, travel speed, traffic accidents, fuel consumption, GHG and air pollutant emissions, while it also considers the acceptance of the examined interventions, as perceived by the locals. The calculation methodologies proposed in the article can help estimate the effectiveness of the measures introduced.

5) Who could be interested in this material?

This article is addressed to students and those looking for a well-structured and concise introduction to methodologies for estimating LOS of pedestrians and cyclists taking into account infrastructure sections shared by them. The paper aims to assist not only researchers but also practitioners who have the responsibility of assessing and designing shared sidewalks or streets for pedestrians and cyclists. The article contains many references to scientific literature in the LOS estimation research area. The presented methodologies can be helpful for those developing measures within SUMPs to identify the necessary data for the monitoring process.

6) What is worth mentioning as an innovative factor for the reader?

There are many studies from which useful conclusions can be drawn about the characteristics (variables) that influence LOS, but the research that results in an easy-to-use (including the data collection process) mathematical model that can provide a useful tool for practitioners is limited.

The inclusion of quantitative and qualitative characteristics provides more accurate results because it can describe, in a more holistic way, the experience of a pedestrian or cyclist. However, in the vast majority of cases, qualitative characteristics involve subjectivity on the part of the researcher or practitioner. Therefore it is necessary to have a way to quantify these characteristics.

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According to some studies, the inclusion of variables derived from user responses (e.g. perceived safety, perceived comfort) contributes significantly to the development of more representative methodologies. This finding is a priori considered logical since users' responses to specific qualitative characteristics of the infrastructure also tend to their overall perception of the infrastructure. Especially when these characteristics relate to comfort level and safety level, which are the main components of metrics for evaluating pedestrian and cycling infrastructure. However, consideration of these variables does not provide meaningful guidance to practitioners who will be called upon to design new infrastructure, as the following questions remain without objective answers: (a) How should I design or manage infrastructure to be safe? (b) How should I design or manage the infrastructure to make it convenient? Furthermore, the need to obtain information from the user whenever the LOS (or Quality of Service - QOS) needs to be determined negates the usefulness of the methodology, since in this case users could be asked directly about the LOS (or QOS) they perceive.

7) Limitations

The paper does not take into account the increasingly often used in cities shared space where motor vehicles besides pedestrians and cyclists move. The authors of the article do not indicate unequivocally which of the presented methods of LOS calculation is the most reliable or useful, but they indicate many doubts in the application of the presented methods and the necessity of their further development. Nevertheless, the approach to the topic as well as the references to scientific literature, are a valuable source of inspiration for preparing SUMPs or for research on the impact of different factors and measures on the level of service of pedestrians and cyclists.