



MAPPING MEASURES OF A SUMP:

A GIS tool for monitoring and evaluating mobility measures

(1) About the LOW-CARB project

LOW-CARB was a transnational mobility project spanning several countries of the Central European region during June 2017 and November 2020 (incl. Germany, Italy, Czech Republic, Hungary, Poland, and Croatia). As part of the *Interreg Central Europe Funding Program*, its activities placed a strong emphasis on reducing transport-related CO₂ emissions in functional urban areas. Consequently, all LOW-CARB pilot measures aimed to increase energy efficiency while reducing energy intensity by improving knowledge and planning capacities for local governments. This involved realization and implementation of: a knowledge platform, smart organization and planning tools, smart infrastructure, vehicles and technologies, ITS services, and preparing guidance strategies and mobility plans for partnering cities. More details about each of these can be found on the project's *website*¹.

(2) The Developer's Role

Understanding the collective impact of individual mobility measures is essential to creating an effective *Sustainable Urban Mobility Plan*² (SUMP). The City of Brno's primary contribution to making Central Europe a low-carbon region within the LOW-CARB project was to design and develop a tool that could help mobility planners attain an overview of measures selected for a mobility plan.

The Department of Transport and the Department of Urban Informatics jointly worked with the company T-MAPY and with local stakeholders to co-develop a concept for a novel tool employing a Geographic Information System (GIS) to synthesize data of multiple mobility measures. At different occasions during the LOW-CARB project lifetime, the concept was discussed together with project partners who provided useful suggestions on tool functionalities and purpose from a transnational perspective (for example at the project partner meeting held in Brno in May 2018).

¹ <https://www.interreg-central.eu/LOW-CARB>

² <https://www.eltis.org/glossary/sustainable-urban-mobility-plan>

It combines numerous mobility measures in a visual format. This greatly aids planners to monitor the number, type, scale, and duration of a measure over the course of a SUMP or action plan. The monitoring tool can additionally be used as an engagement device to help facilitate communication between various stakeholders participating in a SUMP process.

The City of Brno was instrumental in coordinating stakeholder workshops for the development process and testing phase of the tool, as well as dissemination of the finalised product (in 2017 - 2020). They have presented their actions and the tool at over eight EU-wide events in English and local languages during the LOW-CARB project. They were further responsible for the translation of the *SUMP 2.0 Guidelines*³ (the EU Commission's methodology for designing and implementing a SUMP).

(3) About the Monitoring Tool

How exactly does the monitoring tool aid the SUMP process? In 2017 - 2019 the City of Brno finalised the design and development of a 'monitoring tool' that helps both the coordination and engagement activities of a SUMP's development.

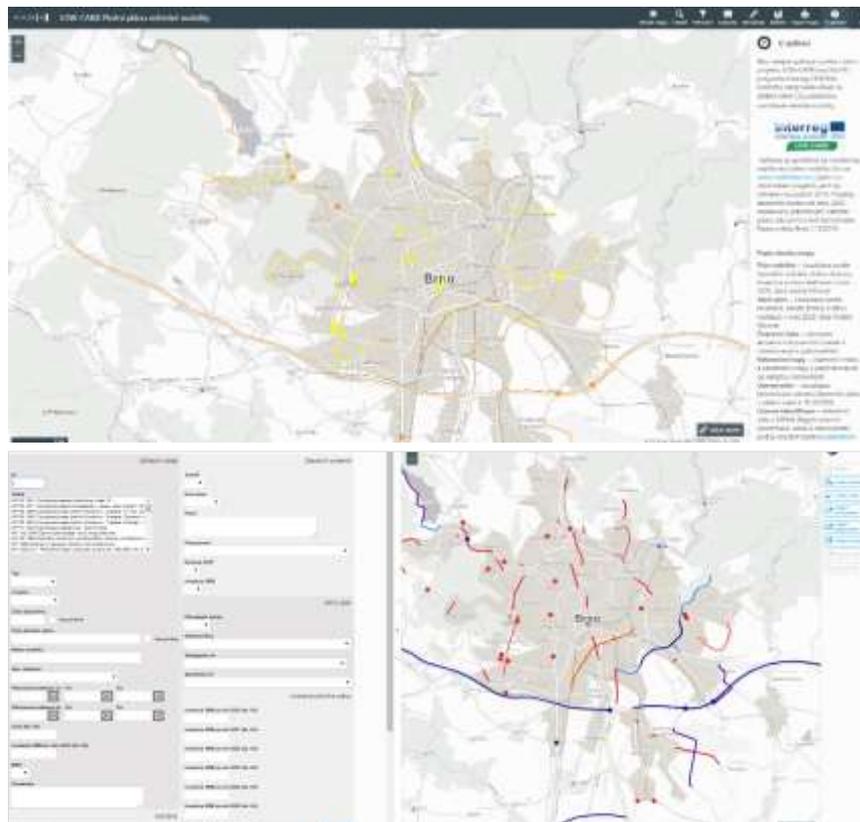


Fig. 1 and 2: Example of measure mapping using the monitoring tool

Monitoring and evaluation in the SUMP process are necessary to ensure that agreed objectives are achieved within time and budget constraints. Here lies the primary niche for the newly developed monitoring tool. Mapping measures in the GIS suite provides a clear visualised overview with easy to access data and information. I.e. details of who is responsible for which measure and over what time horizon, not to mention the respective funding source.

³ <https://www.eltis.org/mobility-plans/sump-guidelines>

It is therefore valuable for multiple phases of SUMP development⁴: the measure selection process during the SUMP's preparation, implementation phase of each measure, and evaluation of measure package impacts. These are described in more detail in the latest version of the SUMP methodology. Since cooperation and discourse among all stakeholders are essential in a SUMP process, the monitoring tool has a second parallel purpose. It should be used as a visual cue and guide for engaging with stakeholders. The tool can be used to display selected measures and demonstrate cumulative intended impacts of the whole measure package. This provides a starting point to continue engagement in a co-creative process driven by easy access of information in the tool directly to stakeholders.



Fig. 3: Although the monitoring tool is primarily for the likes of experts, a light version is also available for the public. The Monitoring tool was used during the development of Brno's own mobility Action Plan for 2020 - 2021. It can be used as a key device to engage with stakeholders (2018, City of Brno).

The tool is publicly available on the municipality's website at <https://gis.brno.cz/>. The tool⁵ can be also accessed directly [HERE](#).

(4) How This User-Friendly, Precise and Participative Tool Works

The SUMP measures are selected and then displayed in the relevant table. Multiple parameters can be filtered according to various criteria - for example by area of change, implementation status, price, start or end of measure, investor, etc. After selecting filters of interest, results are generated in both table and map formats. This provides both a quick overview and gives detailed insights of the measures. From here, results can be further analysed according to strategic or specified objectives.

⁴ https://www.eltis.org/sites/default/files/sump_guidelines_2019_interactive_document_1.pdf

⁵ <https://gis.brno.cz/mapa/low-carb/?c=-597822.5%3A-1159214.3&z=4&lb=zm-brno&ly=pm-realizace%2Cad%2Culn&lbo=1&lyo=>

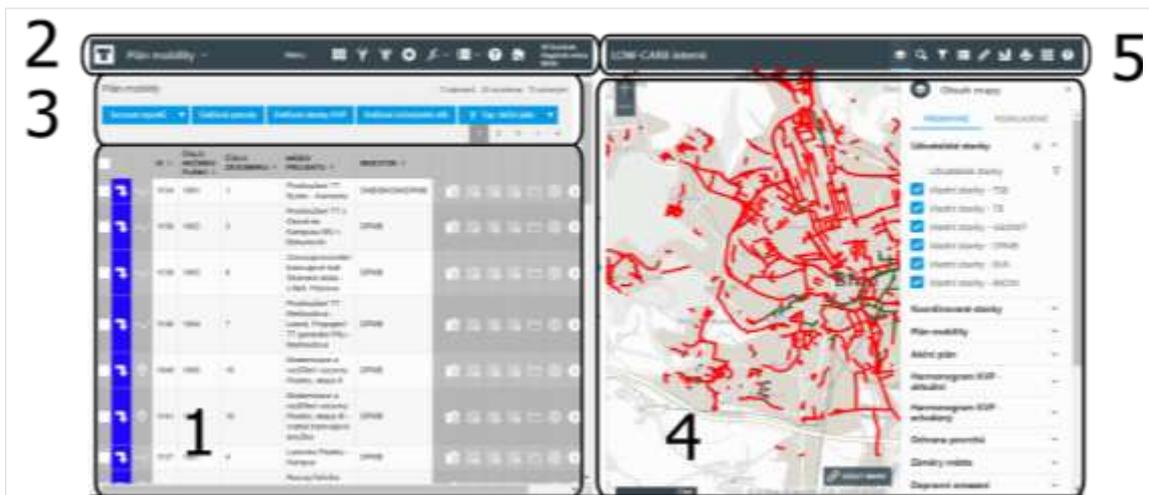


Fig. 3: 1 - list of SUMP measures; 2 - bar with main functions; 3 - functional bar of the agenda section; 4 - map section; 5 - map section toolbar.

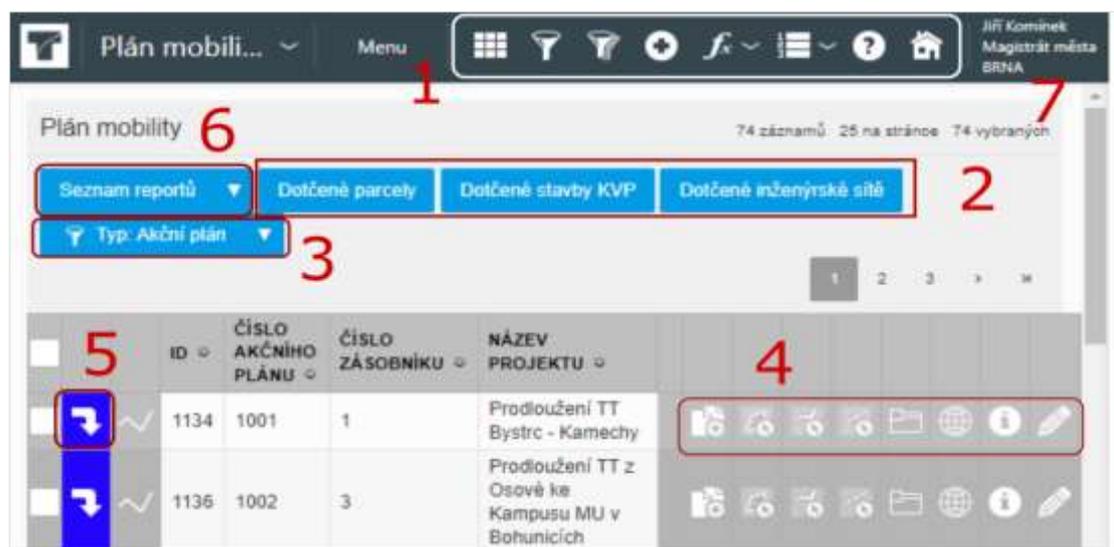


Fig. 4: 1 - toolbar; 2 - agenda tools; 3 - record overview filter - action plan/project stack; 4 - toolbar for actions on individual records; 5 - button to go to the agenda section; 6 - bulk edit toolbar; 7 - indication of the logged-in user.

(5) Technical Requirements and transferability

The application was tailored to the context in Brno functional urban area and it was developed in Czech language to make it operational immediately by all local stakeholders. The technical specifications needed to develop the monitoring tool included: GIS software compatible with existing geodatabase; Web map servers or web client - for displaying maps and tables in web browser; and compliance with Open Geospatial Consortium standards. Even though the application cannot be used as such by cities outside Czech Republic because of the language barrier, it can be easily installed and transferred without major technical difficulties, particularly so, if cities already use a compatible GIS software. The code can be easily transferred and linked to any other language. The monitoring tool as it stands can be considered a prototype of a SUMP-related monitoring tool of measure implementation.

(6) The development process and lessons learned

The City of Brno took the same co-creative approach that the SUMP principles endorse to design, develop, and test the monitoring tool. I.e. stakeholders of Brno's mobility Action Plan were included in every step of development of the monitoring tool too.

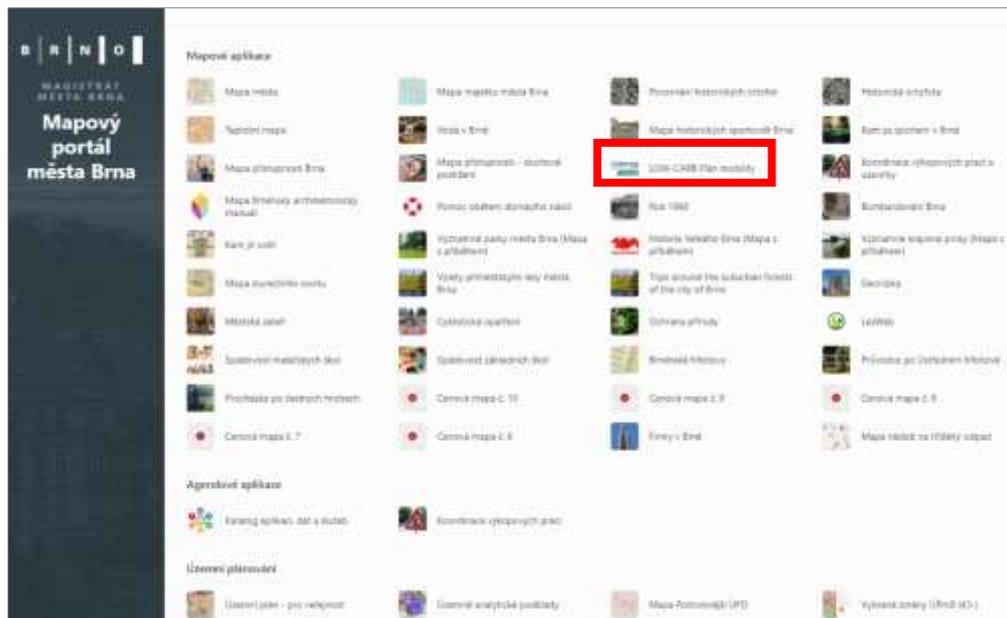


Fig. 5: Screenshot of the City of Brno main portal showing the link to the LOW-CARB monitoring tool

T-MAPY was the tendered company who worked jointly with the Department of Transport and the Department of Urban Informatics. A GIS administrator was hired to lead the development procedure, including acquiring all necessary data and information required to build the tool, organising stakeholder engagement, and contractual management. It took approximately six months and 35,000 EUR to complete. Local and regional stakeholders who were involved in design workshops and testing sessions include: urban planners, transport coordinators, public transport operators, and infrastructure and service providers. Once the tool was ready, stakeholders were again provided with access so that mutual coordination and functionalities could be improved based on their feedback.

Key lessons learned are as follows:

- Like any other tool, the monitoring tool is most effective for a specified range of inputs. It was learned that some measures are not suited for use by this tool e.g. very small-scale measures or measures that need to be implemented urgently (as in the case of gas or water accidents).
- Data entry can be considered time consuming by some stakeholders. It is therefore encouraged to keep the tool up-to-date with regular data entries (this allows the tool to always be ready to use especially in the event that accidents occur during a measure's implementation where quick decisions need to be made).
- "Tradition" is a barrier for adopting new tools for data storage and analysis. Stakeholders have knowledge and habit of relying on Excel, which is not as sophisticated as the monitoring tool. However, this can be mediated by institutional support and motivation to adopt its usage instead of traditional tools and programs.
- The monitoring tool is best suited for measures included in the development of Actions Plans and SUMPs.

(7) Impacts, Continuity and Outlook for the Future

It is foreseen that the monitoring tool will be taken up by regions with existing SUMP and regions of CE that are still to implement a mobility action plan. This tool has already been demonstrated in several workshops and meetings to local, regional, and international stakeholders and featured in EU-wide mobility events (such as the European Mobility Week, Sustainable Energy Week and GIS Day), and demonstrated in several of LOW-CARB's webinars (including the Follower City Program). Furthermore, the tool has been used for educational purposes within the Department of Transport in the City of Brno, where an internship was established for a GIS administrator. This was furthered by local trainings as part of LOW-CARB's project objectives to improve knowledge capacities for SUMP implementation. The tool was additionally vital in the preparation of Brno's own Action Plan and is planned to be used in the preparation and implementation of mobility measures listed in the updated Brno SUMP Action Plan (see output O.T1.2/ D.T1.5.1-4 Brno SUMP Action Plan, soon to be published on the project website).

“The monitoring tool looks good. The selection of maps and the possibility to change the map and its transparency is great. The function and logic of the monitoring tool seem perfectly understandable to me.”

The monitoring tool has been in full operation for the past year. Since then feedback has been collected from many users who have expressed additional recommendations for a more seamless experience. Planned feature improvements and future updates include:

1. When adding a new measure, certain fields will be made mandatory
2. When generating reports, an additional option to automatically generate a presentation will be given.
3. When filtering parameters, there will be the possibility to choose from multiple objectives at the same time.
4. Introduce an outlook for the measures for five years into the future
5. Information provided for specific objectives and investments, will be downscaled for individual years,
6. Each stakeholder will be able to set individual rights

The City of Brno, Department of Transport, is the tool owner and administrator. The GIS administrator and the SUMP expert within the respective department are constantly monitoring the tool usage, evaluate the results, and suggest further improvements according to the needs required for SUMP measure implementation.

The SUMP monitoring tool was developed in strong connection with the updated Brno SUMP Action Plan (O.T1.2, soon to be published on the LOW-CARB website). More details regarding the tool context, development and evaluation are presented in the project outputs D.T1.6.3 Evaluation report of the monitoring tool, and D.T1.6.4 Manual of the monitoring tool (in Czech language), as well as in the brochure available in English and in all Central Europe languages (soon to be published on the project website).

For more information

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November 2020



More info about the project:

www.interreg-central.eu/LOW-CARB



Discover features of the:

[Monitoring tool website](#)