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UrbanSCOPE

Urban Sustainable Mobility in Focus: Student Education, Community Involvement and Participative Planning

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IO4 - SUMP learning courses

National Report - Hungary

SZÉCHENYI EGYETEM
UNIVERSITY OF GYŐR

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TECHNISCHE UNIVERSITÄT DARMSTADT

uhg Forschungsgruppe Urban Health Games

Content

1. Introduction

One of the core aims of UrbanSCOPE project was to develop a flexible, adaptable and innovative course for different target groups, namely university students, secondary school students and adults, in order to educate them on sustainable urban mobility. After the creation of the Learning Methodology, the following step of the project was to develop a generic course, and adapt (as well as test) it in the local context.

This document reports on the pilot testing of the Learning Methodology in Hungary, tailored for civil engineer students at the Széchenyi István University. The course and the implementation of the Learning Methodology will be presented, followed by the didactic tools for visualization and teamwork, referring to the syllabus and the tasks completed by the students. The description of implementation will be followed by the results and the evaluation of the course, referring to the collected feedbacks both from students as well as teachers.

2. Presentation of the course at the Széchenyi István University

The learning methodology was tested in the 2021/2022 autumn semester of Széchenyi István University. The course description and requirements were following the SUMP principles and methodology. The students could use digital tools in order to solve their task in teams.

Table 1: Implementation of the SUMP Learning Methodology

Learners	Bsc Students of the Department of Transport Infrastructure and Water Resources Engineering (Full-time and correspondence students)
Background knowledge and skills	urban planning, transportation infrastructure planning, geodesy
Discipline(s)	transportation sciences
Duration	1 semester (10-12 weeks)
Course name	Transportdevelopment Project I.
Credits	8 ECTS
Course format	Project work
Digital tools	Siftr, GIS, szelearning/Moodle
Case study area (Győr-Ménfőcssanak-Gyirmót)	Case study area is understood as a physical (urbanised) location, where the symptoms of transportation problems are observable. The case study area will serve as a location for the sustainable urban mobility scenarios and solutions (sample SUMPs) elaborated by the students. The demarcation of the area is obvious and has a clear border. Case study areas should be presented on a map. As case study area, Ménfőcsanak has been chosen, as a suburban neighbourhood in Győr.
Target group	In terms of educational objectives: BSc students In terms of SUMP preparation and analysis: local residents, school children, commuters, pensioners, etc.

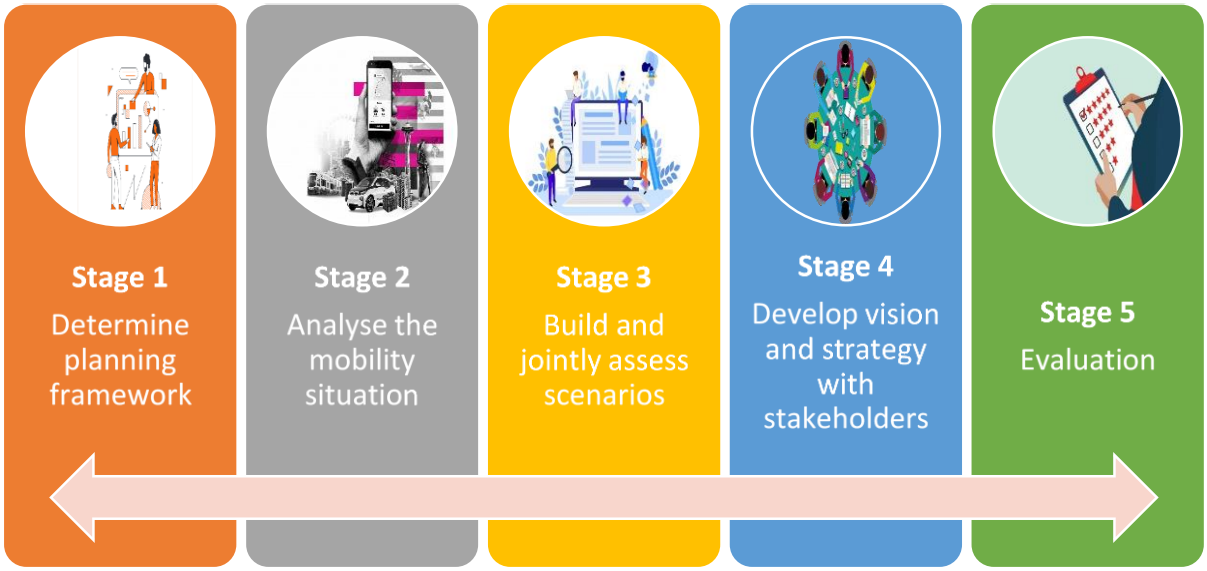
2.1 The didactic concept and methodologies

The course has been implemented with altogether 70 students and 5 teachers/facilitators with different professional background (urban planner, civil engineer, bicycle infrastructure and transportation safety specialist, GIS expert, water engineer). The role of the multidisciplinary teacher's team was to accomplish all the requirements of the SUMP. Regarding the students, all were on BSc level, and 43 of them were involved in full-time education, while 27 were distance learning (part-time) students (*Annex 1*).

The core aim of the course was the preparation and pre-analysis of a Sustainable Transport Development Strategy/ Sustainable Urban Mobility Plan (SUMP), regarding a clearly demarcated area in Ménfőcsanak (a suburb of Győr). The task itself can be considered as very complex: students needed to prepare development ideas that are referring to real-life and actual problems, as well as are able to ensure the medium- and long-term transport development, serving the mobility needs taking into account both economic, social and environmental aspects. During planning, instead of "consumer ethics", the more sustainable "preserving ethics" needed to be applied, according to which every transportation mode is equally important and in every traffic situation that mode of transport must be chosen and developed, which best serves the achievement of the given goal, with minimal resource usage.

The SUMP Course at the Széhenyi István University has applied and tested the previously developed UrbanSCOPE Learning Methodology (Figure 1).

Figure 1: The SUMP Learning Model



Source: SUMP Learning Methodology and Tools (IO3 Methodology document), 2021

For each of the above stages, different methodologies and concepts were applied, in order to accomplish the complex task.

For Stage 1, teachers have **determined the case study area**, and divided the students into groups. Each of the groups were responsible for a clearly demarcated (smaller) area, where the complex investigation and scenarios-development should have happened. Also, through classic, frontal lessons, students were familiarized with the core concept of SUMP, as well as the details of the project work.

Stage 2 was focusing on the **analysis of the current situation**, through 2 main steps:

- Situation analysis: analysis of examined factors, their influence on each other, analysis of actual conditions, document analysis.
- Situation assessment: synthesis study, evaluation of external and internal factors, preparation of a problem map, mapping of opportunities and limitations.

In order to make the project work more transparent, the territorial analysis was divided into 4 major disciplinary area. Each of the different disciplines included a specific task for the conduction of the analysis. The following disciplines and tasks were mentioned:

Part 1) Supporting the development of cycling and pedestrian transport. For the analysis, students had to carry out a traffic counting, based on the needs of the municipality, for at least 1 junction (during peak hours).

Part 2) Supporting the development of the condition of road surfaces. For the analysis, students had to carry out a GPR (Ground-penetrating radar) survey, on 1 road section, jointly selected with the municipality.

Part 3) Supporting traffic safety and traffic engineering developments. For the analysis, students had to collect and analyse the traffic accident data, and select 1 particularly dangerous junction, which needs to be audited from a traffic safety point of view.

Part 4) Supporting the development of rainwater drainage and surface water management. For the analysis, students had to select 1 trench section and/or 1 artefact, that needs to be examined in more detail.

After the complex situation analysis and assessment, student needed to prepare a problem map / value map in GIS. The map representation should be a summary of the case study area's problems and values, territorial opportunities and constraints.

Stage 3 was focusing on the building of scenarios/development ideas, thoroughly based on the previous analysis. Within this phase, students needed to conduct a reasonable and transparent goal setting, comprehensive vision, definition of priorities and measurable goals, as well as compilation of development ideas.

Similarly to Stage 2, the different disciplinary areas had different determined goals for the development ideas, namely:

Part 1) Supporting the development of cycling and pedestrian transport. For the future development ideas, students had to plan at least 1 new cycling facility on the case study area.

Part 2) Supporting the development of the condition of road surfaces. Based on the GPR (Ground-penetrating radar) survey, a development proposal must be prepared for the road condition repair.

Part 3) Supporting traffic safety and traffic engineering developments. A proposal must be made for the dangerous junction, in order to ensure traffic safety.

Part 4) Supporting the development of rainwater drainage and surface water management. Based on the performed hydraulic test, a proposal must be made for the development of the system.

Stage 4 is focusing on the involvement of stakeholders, and during the course it has been accomplished through 2 main steps:

- Constant reconciliation with the municipality: during each of the learning stages, a consultation with the municipality was necessary, in order to ensure that real-life and actual problems are covered by the students. For the course, the elected member from the case study area of the local authority was taking part and was available for the students' questions.
- Identification of local interest groups, needs assessment and presentation of the needs of local communities. During the project work, 1 interest group had to be selected by the students, whose traffic habits and needs should be examined and presented. For this task, students were able to use the IO1 questionnaire survey as a sample.

Finally, in Stage 5, students needed to conclude their results and make a revision. During the semester, students had to prepare 2 interim and 1 final report on their work, which they also had to present orally. During the presentations, all group-members had to be present (and they also had to take role in the oral presentations). After the presentations, students' work was valued based on an evaluation matrix. Furthermore, besides the official scoring and evaluation, the student-groups also needed to take part in consultations with the teachers of the course,

where they also had the chance to ask questions and ask for clarifications, and they also got feedbacks on these sessions.

The following table summarizes the stages and the connecting methodology that was applied.

Table 2: Applied methodologies during the SUMP Course in Hungary

Learning stage	Applied methodology & concept
Stage 1: Determining the planning framework	Defining the groups and group-members (Belbin Test on group roles) Determination of the case study area
Stage 2: Analysing the mobility situation	Situation analysis: analysis of examined factors, their influence on each other, analysis of actual conditions, document analysis. Situation assessment: synthesis study, evaluation of external and internal factors, preparation of a problem map, mapping of opportunities and limitations.
Stage 3: Build and jointly access scenarios	Conduct a reasonable and transparent goal setting, comprehensive vision, definition of priorities and measurable goals, as well as compilation of development ideas
Stage 4: Develop vision and strategy with stakeholders	Constant reconciliation with the municipality Identification of local interest groups, needs assessment and presentation of the needs of local communities
Stage 5: Evaluation	Preparation of 2 interim and 1 final written report Presentation of the written reports (oral presentation) & evaluation

2.2 The didactic tools used: teamwork & visualization of the concepts

The learning methodology has been maintained by digital learning tools, that has been supported the research and planning activity of students and teachers. The digital tools were very valuable especially during the period of COVID'19 lock down. Although during the pilot course (i.e. 2021/22 autumn semester), students were allowed to meet and have lectures at the university, in many cases they were preparing their project work on their own (without contact-lessons), therefore, it was very important that different digital tools help their cooperation and joint thinking. Furthermore, digital tools are also very valuable when preparing own map-based ideas, since visualizing problems and solutions are a core part of scenario-building.

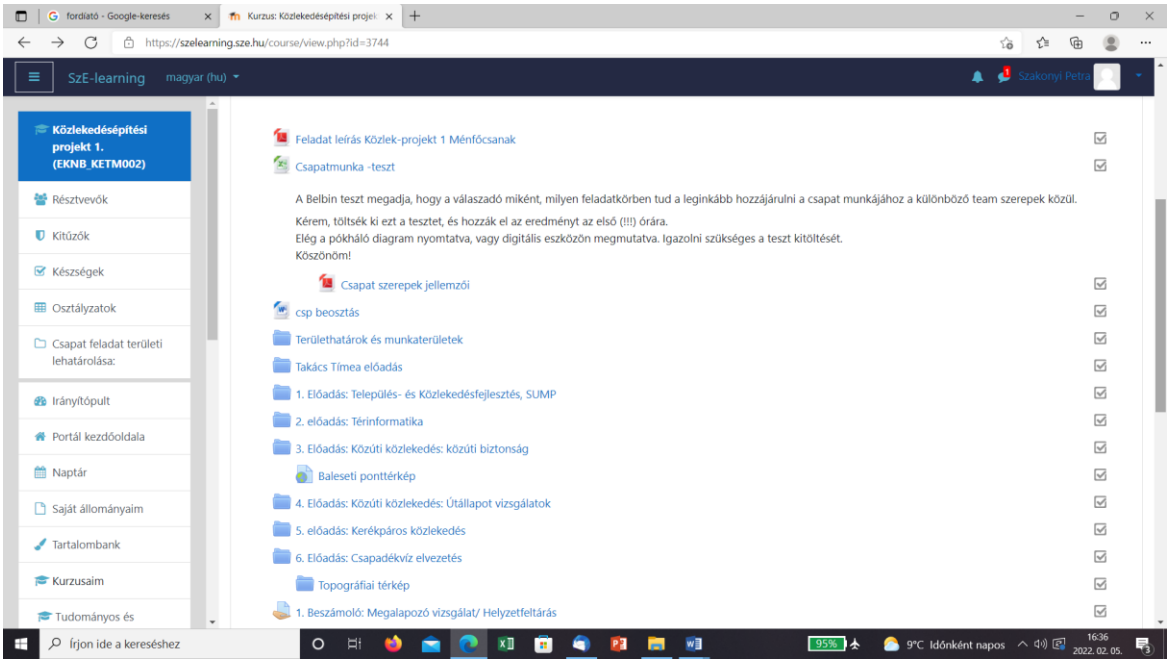
The innovative digital tools such as Moodle management system, augmented reality application and GIS system, sustained individual and teamwork as well.

Moodle LMS Open Source Management System

The Szechenyi Istvan University (SZE), Győr Hungary has a Moodle LMS management system, called "Szelearning", which provide flexible learning environment in any circumstances, even in lock downs. "Szelarning" ensure open source for students; it is an ideal pedagogical toolbox, that can be used for individual education platform to teach the way you want, and to add any number of students.

The mobile learning App of "Szelearning" has the experience of Moodle LMS on touch screen devices and allows the use of Moodle in many environments where learners don't have computers or only poor internet connections. "Szelearning" is an ideal platform to guarantee integrated content accessibility for students and support the build the courses that accommodate all learners. Course requirements are also easy to follow by week to week.

Figure 2: Course requirements and tasks of the Transportation Project subject on "Szelearning"



Augmented Reality application

Several AR application can support the SUMP courses, enabling to lecture a wide audience – both students and the general public, planning practitioners and policy makers. These applications aim to geo-locate problems or challenges of sustainable mobility in an area, allowing the user of the app to make comments online and on location, which in turn can be read and filled by the experts and the local authority.

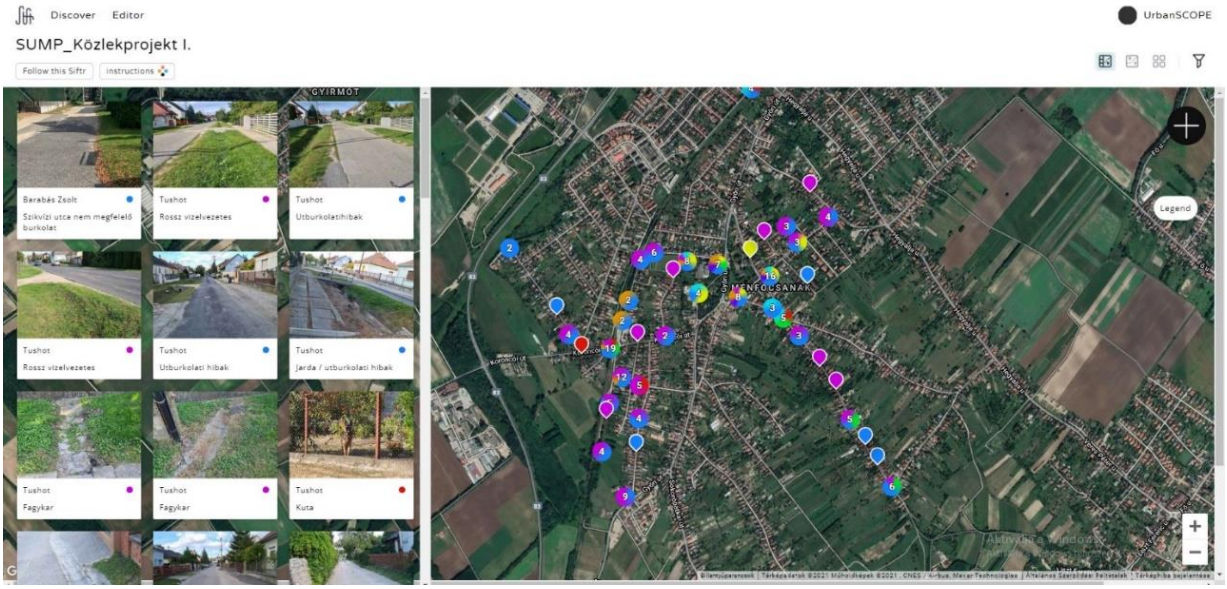
During the course the Siftr application was selected and used by the students. Siftr is an open and free platform for collaborative mapping developed and supported by the Field Day Lab, a lab active in the development of educational games and digital learning resources within the University of Wisconsin in the USA, led by David Gagnon, creator of the popular Location-Based Game development platform ARIS. Siftr is a freely available platform, accessible both from desktop devices (e.g. desktop computer) as well as from mobile devices (e.g. smartphones or tablets), that offers anyone the opportunity to develop collaborative learning activities with reference to the real world, without any particular prior digital skills.

Siftr allows a facilitator to create framework for mapping input according to a certain theme, and then let either a small group or the general public use their smartphones to go out and document geographically relevant material. Siftr gathers this input in the form of photos, text and of course location, and illustrates it so that it is easy to view and discuss the data as a group on a larger display together. An additional feature of Siftr is the ability to interact by adding

comments and "liking" certain input. Furthermore, Siftr's features for on-the-scene collaborative mapping are freely available and can be easily used by all, assuming a basic level of skills in using computers and smartphones (i.e. browsing the internet, downloading and installing apps on a mobile device, taking photos).

In the framework of the course, the application Siftr is related to the provision of information on transport related problems, challenges, and sustainable mobility opportunities, providing feedback on the physical space along the case study area, and suggesting improvements related to the facilities and infrastructure present. During the field trip, groups of students were able to collect information, and outline the main characteristics of their selected target area, and geo-locate the main problems that hinder sustainable urban mobility. As they walked around, students took photographs, added short texts and categorized the content according to various criteria. As a result, students were able to easily create a problem map for the case study area. Since the information of the different groups are collected and entered in the same platform, the Siftr map can be also presented in class for discussion and evaluation purposes.

Figure 3. Problem map developed by students during the course by Siftr

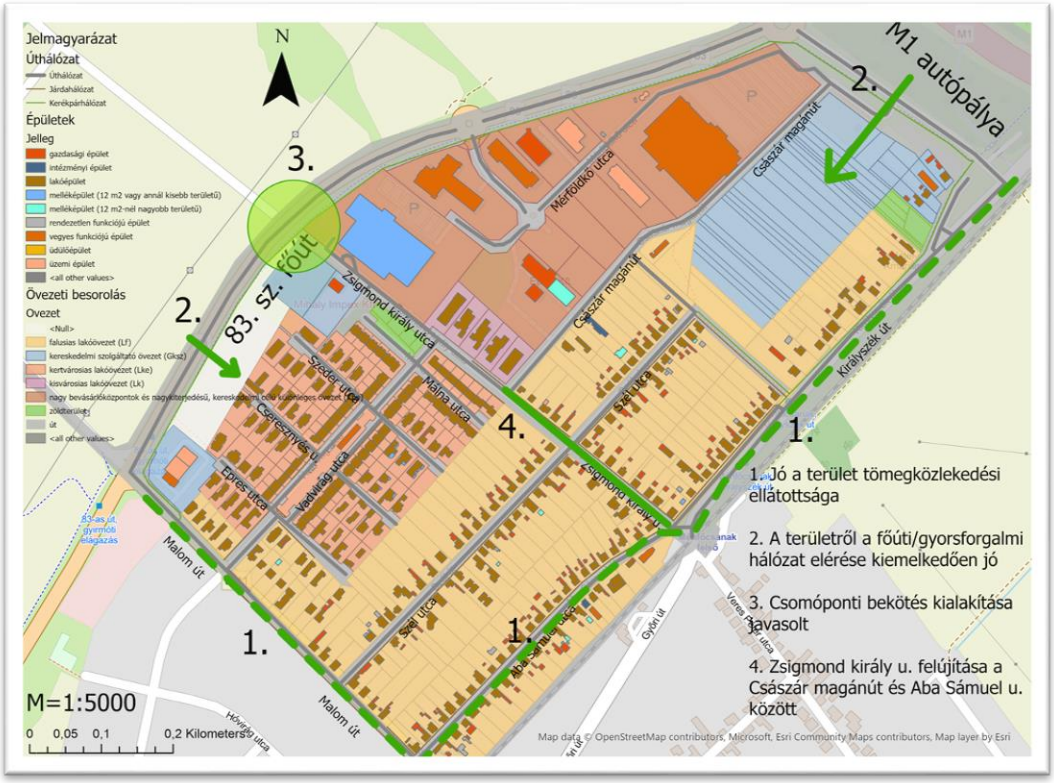


Geographic information system (GIS)

During the semester, students also had to create a unified GIS system where the result of the on-site surveys and suggestions for improvement were recorded.

A geographic information system (GIS) is a system that creates, manages, analyzes, and maps all types of data. GIS connects data to a map, integrating location data (where things are) with all types of descriptive information.

Figure 4. Development Aims –suggestions made by a group of students in GIS



The created GIS maps served as a main basis for evaluation of the work, as it not only contained the current mobility situation, but also the suggestions created by the students in order to establish a more sustainable urban mobility in the examined area. In this regard, these maps (together with the written assessment) can be considered as SUMP scenarios.

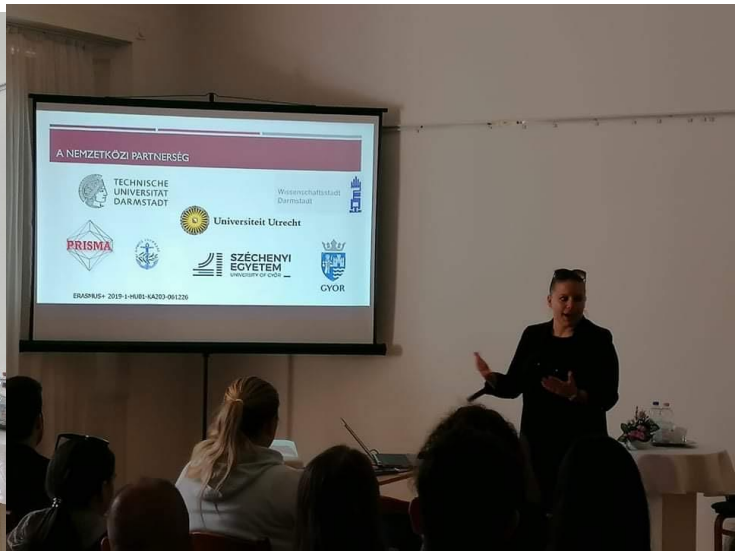
2.3 The syllabus and working plan/tasks

At first, students were divided into 8 smaller groups (each containing about 5-6 students). Each group was responsible for a specific, clearly determined case study area (*Annex 2*).

During the first 2 weeks, students were introduced to the main concepts and elements of sustainable urban mobility (mainly through frontal teaching). After that, a meeting was organised with the elected member of the local authority (responsible for the case study area), who introduced the main problems and transport issues of the area. Furthermore, students also got an introduction to the UrbanSCOPE project, and the use of Siftr application. Students took part in a field trip, where they collected their own photos and views on specific problems. The first problem map was developed by students in Siftr during the first side visit.

After the site visit, students had to make analyses on the current situation of the Ménfőcsanak development area. These analyses have been made about the social, economic and environmental situation, which was needed for the SUMP strategy, included baseline data about the site (e.g.: location of the site, demographic data about the society, human infrastructure endowments, economic features, natural and built environmental characteristics, transport infrastructure and mobility services, modal-split etc.). The results of the analyses were presented after the first four weeks of the course.

Photos of the field visit and meeting with the member of the local municipality and presentation of UrbanSCOPE (21/09/2021), Location: Ménfőcsanak, Bezerédj Kastély



With the experience of the first part of the task the work has been continued with the setting of goals. As a first step medium- term, strategic goals and their context were defined in order to achieve SUM goals and then the sub goals were planned regarding to urban planning and transportation infrastructure and service planning especially for public transport and bicycle development. A problem map was also prepared in this phase, which was also presented by the teams together with the goals and sub-goals.

As the last phase of the project work, students have been prepared the SUMP strategy also taking into account the results of the first two phases and the result of the population/questionnaire survey. During the last contact seminar, students gave an oral presentation on their work.

Photos of the final presentation made by the students (07/12/2021)

Location: Széchenyi István University, Győr

2.4 Outcomes: a summary of the results of the student's projects

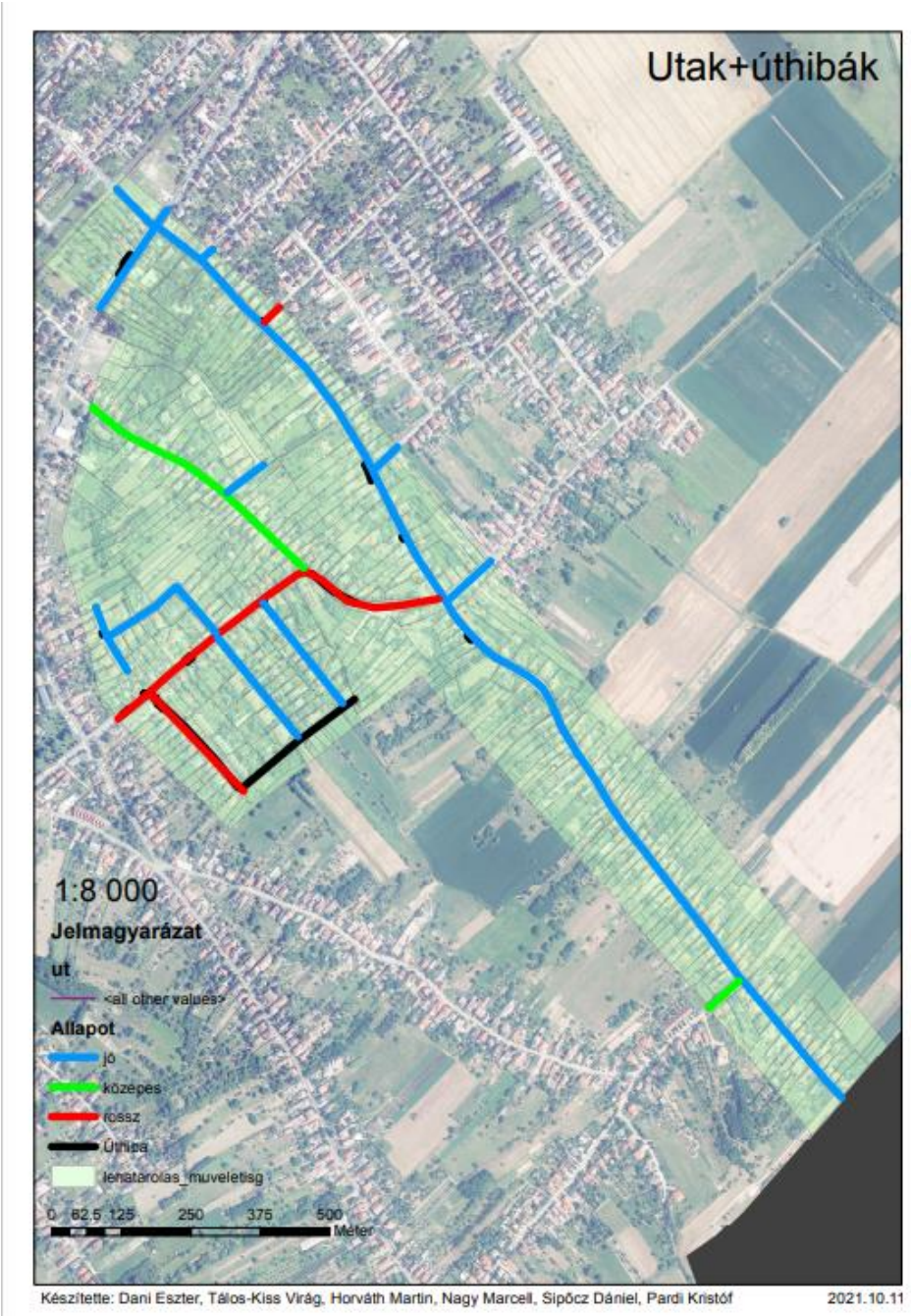
During the semester, students had to prepare 3 written reports (2 interim, based on the current work session and 1 final report). The content of the reports are as follows:

- 1st interim report: analysis of the current situation of the case study area, including analysis of examined factors, their influence on each other, analysis of actual conditions, document analysis.
- 2nd interim report: problem-map and goals, including a synthesis study, evaluation of external and internal factors, preparation of a problem map, mapping of opportunities and limitations.
- Final report: SUMP strategy and scenario on the case study area.

The final documentation (SUMP strategy) per group was approx. 70-100 pages long, including all 4 disciplinary areas (i.e. cycling and pedestrian transport; condition of road surfaces; traffic safety and traffic engineering developments; rainwater drainage and surface water management), and the prepared maps. As the complete documentation is very extensive, a couple of examples will be given in the followings.

Example 1: Analysis of the current situation of road surfaces, and the connecting problem-map (on case study area no. 5)

Students have collected and documented (with photographs) all the road surface problems, connecting to roads, pavements or cycling routes. The following problem-map was evaluated:



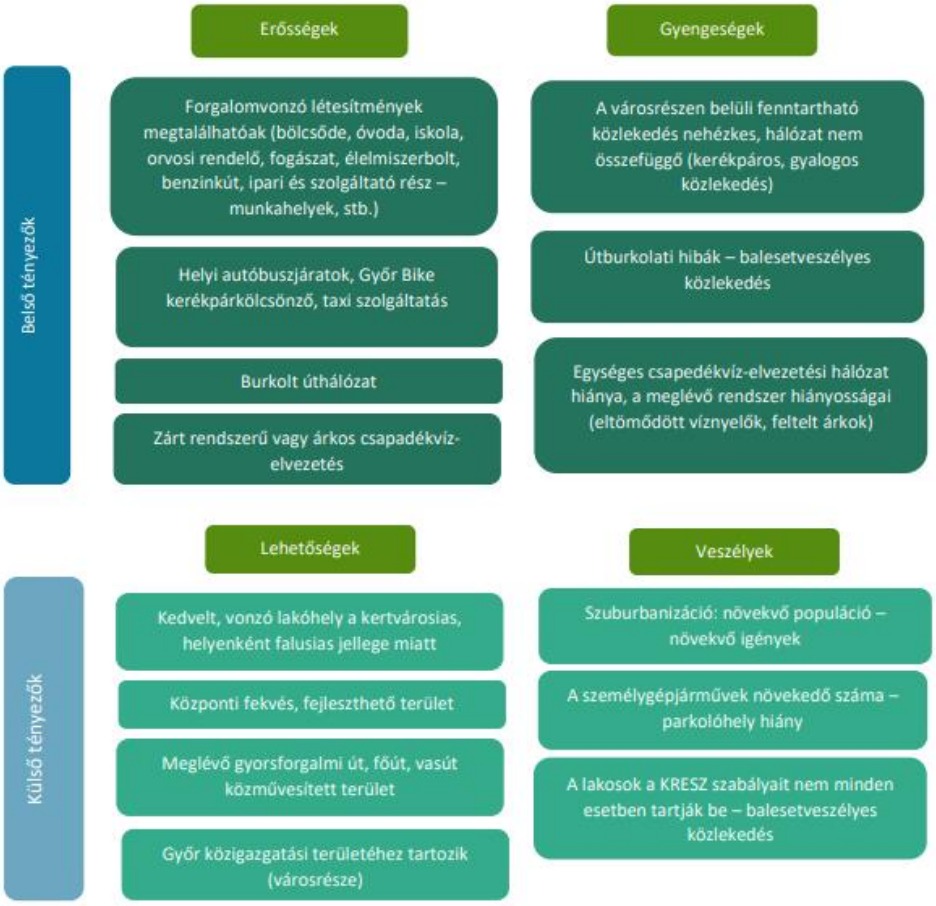
As it is visible on the figure, the road conditions have been marked with 3 colors, where blue meant the good condition, green referred to medium condition and red meant bad condition. The black lines indicate road surface damages, that have been photographed and documented beforehand.

Example 2: SWOT-analysis based on the current situation (case study area no. 1)

Students have concluded the current mobility situation in a SWOT-analysis. The main observations can be summarized as follows:

By improving the sustainable transport network characteristic of the city, taking into account growing needs derived from suburbanisation and taking advantage of the area's attractive garden-city character, the traffic-attracting facilities will become more accessible to residents, as well as the popularity of the local Győr Bike bicycle rental system can also be increased.

The repair of road surface defects is necessary, taking into account the increasing passenger vehicle traffic, in order that the quality of the existing paved road network becomes satisfactory, which also reduces the risk of accidents.



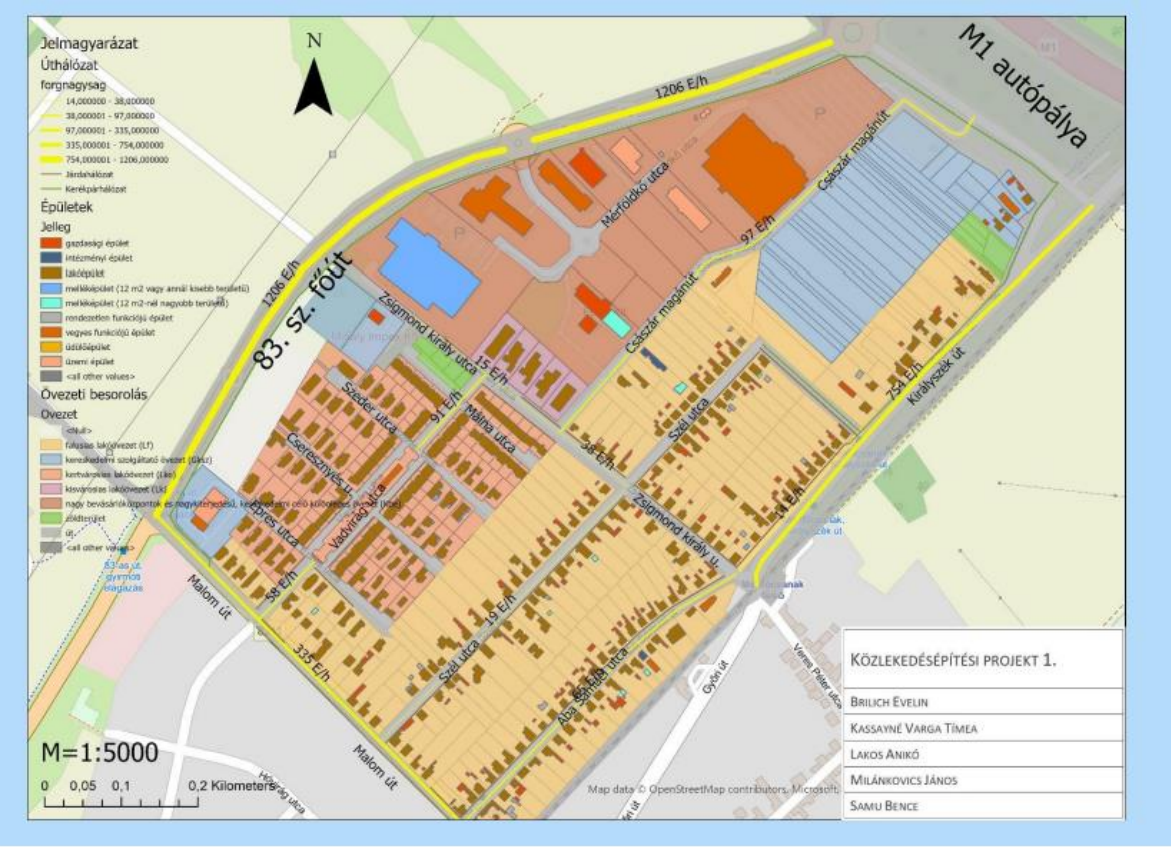
Example 3: Analysis of the current situation based on traffic volume, and the connecting problem-map (on case study area no. 1)

Students have conducted a traffic volume calculation, based on 10 stations, also including the peak hours in the morning and in the afternoon. Based on the results of the calculation, the traffic volume was also presented on a map.

Results of the traffic volume counting (blue is the morning peak hours, purple is the afternoon peak hours):

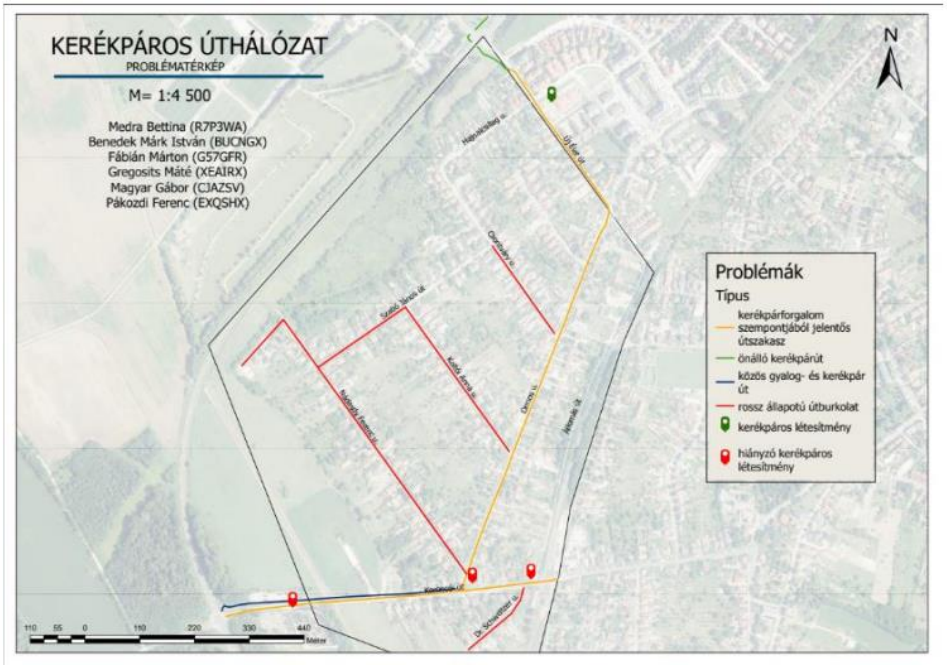
	Reggeli csúcsidőszak						Délutáni csúcsidőszak			
Idősáv	7:00-8:00	8:00-9:00	9:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:00	16:00-17:00
Állomás	1. állomás	2. állomás	3. állomás	4. állomás	5. állomás	6. állomás	7. állomás	8. állomás	9. állomás	10. állomás
Járműtípus (db)										
Személygépjármű	82	79	13	29	12	6	690	51	75	45
Kistehergépjármű	12	9	2	7	5	0	42	3	10	7
Tehergépjármű	0	0	0	0	0	0	0	0	10	0
Autóbusz	0	0	0	0	0	0	7	2	4	0
Motorkerékpár	2	1	0	1	0	0	0	3	2	4
Kerékpár	4	6	0	3	4	24	12	12	22	9

Problem-map and traffic volume:

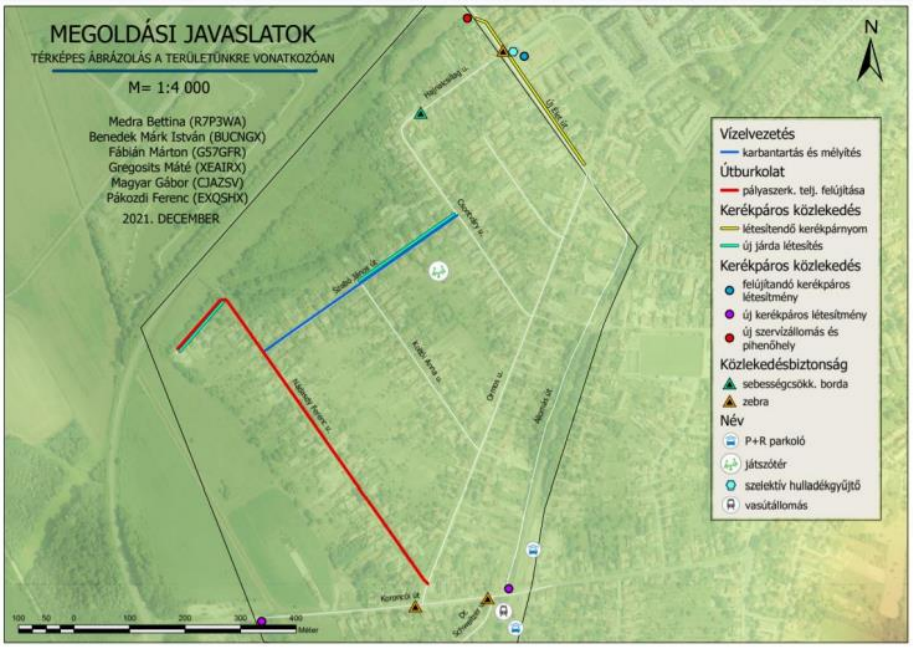


Example 4: Analysis of the current cycling network, and the proposed solutions (on case study area no. 3)

Students have analysed the state of the current cycling network and created a problem-map. Yellow means that the given road section is significant for cyclers, green marks the independent cycle ways and red means that the road surface is in bad condition for cycling. As for the points presented on the map, green marks the currently available cycling facility, while red indicates those areas where a cycling facility would be necessary (but is currently unavailable).

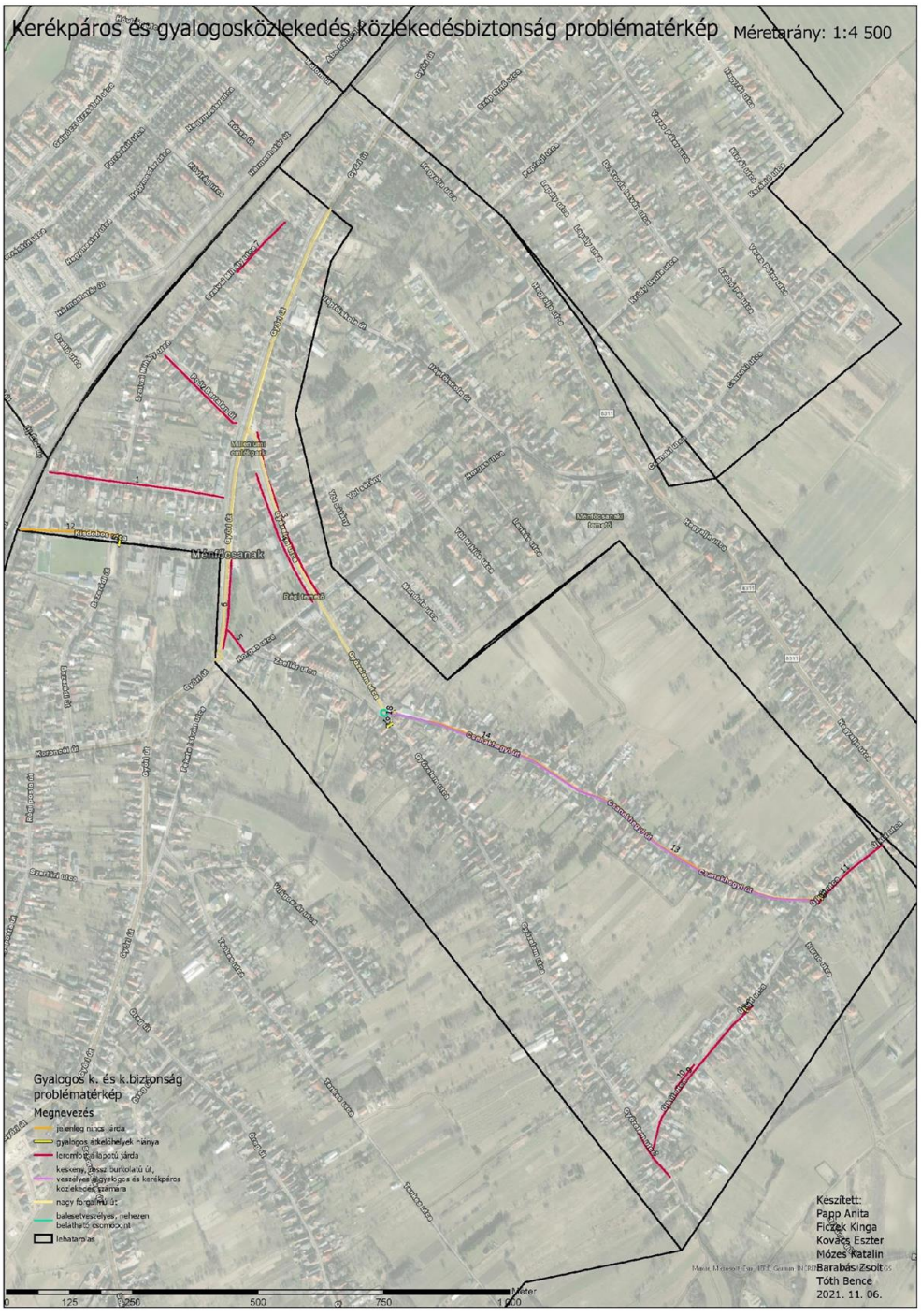


After analysing the current situation, students have prepared the suggested solutions, which they also presented on a map. Regarding the cycling infrastructure, students have suggested new cycling facilities (marked with purple), new service stations and resting places (red), and new bicycle track (yellow).



Example 5: Analysis of the current situation of pedestrian and cycling facilities, and the connecting problem-map on traffic safety (on case study area no. 6)

Students have collected and analysed those conditions that are necessary for a safe pedestrian and cycle transportation, also highlighting the dangerous sections and crossroads. The following problem-map was evaluated:



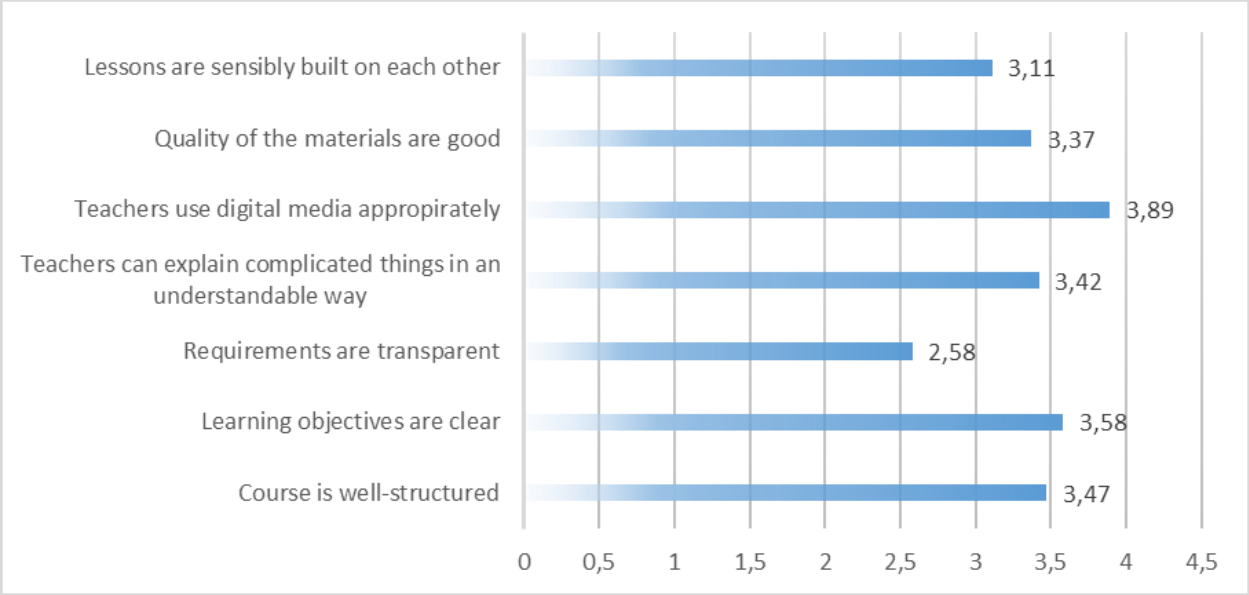
The map includes those areas where there is currently no pavement (orange), the lack of pedestrian crossings (yellow), the bad condition pavements (red), the narrow or bad condition road surfaces which is dangerous for the pedestrian and cycling traffic (purple), as well as the incident-prone intersections (low visibility) (blue).

3. The Evaluation of the course

3.1 Evaluation from the student´s perspective

After the completion of the course, students were asked to tell about their experience and satisfaction, and give an overall evaluation of the semester. For evaluation purposes, a questionnaire was used, combining Likert scales and also open questions (altogether 18 questions). Students could take part voluntarily and anonymously. As a result, 27,9% of the involved students gave their feedback[1].

Figure 5. Evaluation on contents and organization of the course (1-5 scale)



Source: students' evaluation questionnaire, own editing

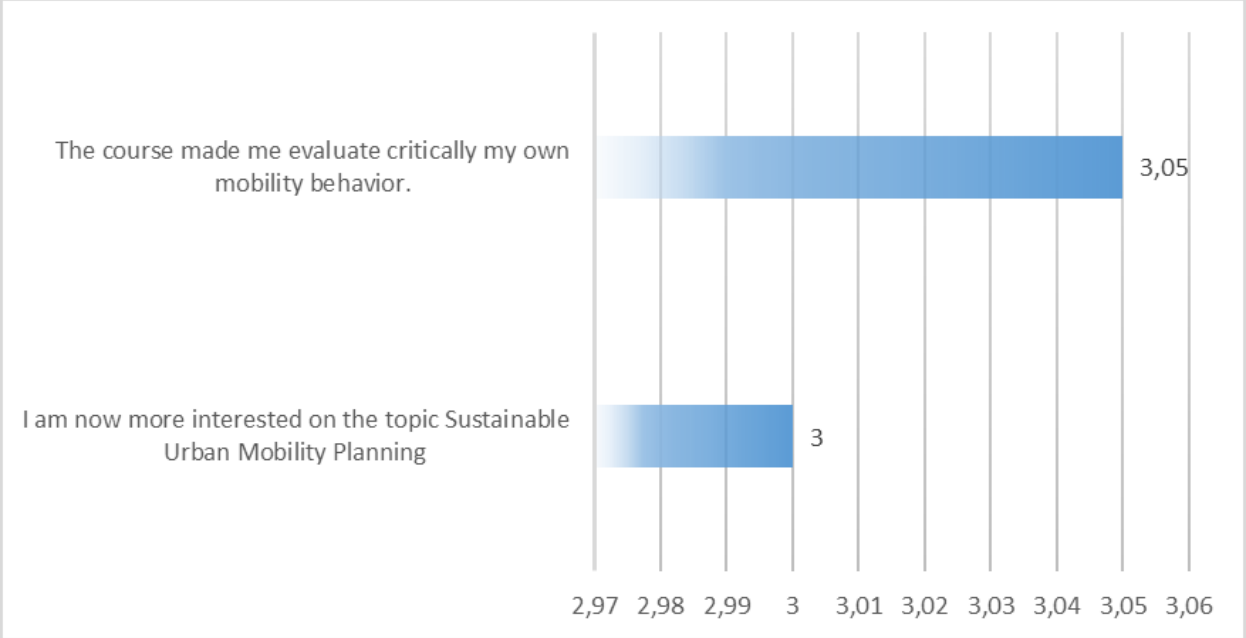
As it is visible, the overall evaluation on the contents and organization of the course can be considered as adequate (Figure 5). The mostly appreciated aspects were the handling of digital media and the learning objectives, closely followed by the course structure, the explanations gave by the teachers as well as the quality of materials. It seems apparent that students understood the core elements of the methodology, and they thought that the course is well-structured. Naturally, there were aspects that got a little lower satisfaction-rate, especially the transparency of the requirements. Considering that this was the first time that the methodology was used and tried out, the requirements and grading criteria and terms might have seemed a little vague, this is clearly an area which needs further development.

As for the specific, content-related evaluation, it is gratifying that 78,9% of the responding students have found the course interesting, and more than 94% of them stated that this course

[1] The rate is a bit different among full-time and correspondence students: 30,2% of the full-time students, while 24% of the distance learning students gave feedback and filled in the questionnaire.

was different from others. This clearly supports the need of integrating new methodologies and complex, real-life topics into university education.

Figure 6. Evaluation on attitude changing and behaviours (1-5 scale)



Source: students' evaluation questionnaire, own editing

As it is visible on Figure 6, the course was also able to generate some amount of attitude changing. Students are now able to evaluate their own mobility behavious, and (although to a bit less extent) but are more interested on the topic of SUMP. Since the core element of sustainable urban mobility lies in the involvement of stakeholders and citizens in general, this course is able to raise awareness to a higher level.

In the frame of the evaluation, students were also asked about the problems that they have faced during the course. Although 89% of the respondents have reported occurring problems, most of these were related to the non-efficient workload of the team. Some members have worked more, while some others put considerably less effort in the implementation of the group work. While this is not a positive feedback, this problem refers to the nature of team work, and fortunately this is clearly an area where positive development is easy to trigger. Some students also highlighted the complexity of the submitted task. A valuable proposal was made to show a sample project in the beginning at the course, which should be considered in the later courses. Finally, students were also asked about their highlight of the seminar. A couple of positive remarks is listed below:

"I have learned many new things, for example regarding pedestrian traffic."

"I gained a lot of new knowledge about subjects that will prove to be useful in the next semester as well."

"To understand the complexity of some problems, how important it is to coordinate the various disciplines for the sake of exact realization"

"Looking back at the finished task with the mind before completing the course and realizing the change in attitude."

"Coming up with the development proposal. After completing the survey tasks, it was very enjoyable to look at what would be the best change from several perspectives."

It is a pleasurable fact that most of the students emphasized that they enjoyed the field work (and analysis carried out on site) and the usage of different digital tools (Siftr and ArcGIS). Naturally, students will carry forward the gained digital skills.

3.2 Evaluation from the teacher´s perspective

Altogether 5 teachers/facilitators with different professional background supported the evaluation of the task, as follows:

- Dr. Petra Szakonyi , urban planner,
- Dr. Emese Makó, civil engineer, bicycle infrastructure and transportation safety specialist,
- Zsófia Magyari GIS expert,
- Richárd Nagy, civil engineer,
- Máté Chappon water engineer.

Table 3: Overview and SWOT-analyses by the teachers

STRENGTHS	Good collaboration of the multidisciplinary teacher-team Representation of different disciplines and professionals Collaboration with the local municipality Determination of real-life problems and study-visits Use of new digital technologies (especially Siftr) Available SUMP Learning Methodology
WEAKNESSES	Constantly reported problems by the students with the team-work and team-composition Relatively short time for completion
OPPORTUNITIES	Use of further digital technologies (UrbanSCOPE Tool) Apply (and adapt) the methodology for further case study areas
THREATS	Different expectations (and standards) within the teachers' team Lack of motivation due to the independent work

The role of the multidisciplinary teacher's team was to accomplish all the requirements of the SUMP. The collaboration of a multidisciplinary team of teachers in itself can be seen as a strength and a threat as well. For the implementation of the course, it is excellent that the different discipline areas are working together, ensuring that each field is represented by a professional, maximizing the effectiveness of the learning process. On the other hand, it might

cause confusion among the students, as different teachers might have different expectations and standards. Nevertheless, this threat can be solved by the determination of a clear evaluation criteria and by constant feedback and discussion among the members of the teacher-team.

The main role of the teachers was to give guidance and provide constant consultation with the students and teams, which took place continuously according to the curriculum (Table 4). After the lectures, the students performed their tasks independently, following the order of the SUMP's steps.

Table 4: Roles and functions, tasks of the teacher-team throughout the semester, according to the curriculum

Week	Date	Tasks
	5th Sept	Belbin test (Belbin Team Roles | Belbin) made by students.
Week 1	6th Sept	Assembling teams according to the results of the test. Introduction of the task and SUMP methodology, presentation made by Dr. Petra Szakonyi Introduction to the 4 disciplinary work sections: Geospatial Informatics; presentation made by Zsófia Magyari Environmental friendly transport, presentation made by Dr. Emese Makó Road safety, presentation made by Dr. Dániel Miletics
Week 2	13th Sept	Discoussion with students: Step 1: Set up working structures Step 2: Determine the planning framework Step 3: Analyse mobility situation
Week 3	20st Sept	Holliday
Week 4	27th Sept	Study visit Presentation of local representative of the municiplaity
Week 5	4th Oct.	Consultation
Week 6	11th Oct.	Mid-term presentation by teams
Week 7	18th Oct.	Presentations: SWOT analysis Step 4: Preparing jointly assess scenarios
Week 8	25st Oct.	Consultation
Week 9	1st Nov	Holliday
Week 10	8th Nov.	Mid-term presentation by teams
Week 11	15th Nov.	Preseantations: Step 5: Vision and strategy development Step 6: Set targets and indicators Step 7: Select measure packages Step 8: Action planning
Week 12	22nd Nov.	Consultation
Week 13	29th Nov.	Final presentation by teams
Week 14	6th Dec.	Upload of SUMP to the szelearning
	13rd Dec.	*Additional deadline*

As the implementation logic of the course included a high amount of independent work from the students, this can be considered as a threat, as in some cases the motivation can only be given through constant requirements. In many cases, students reported problems within the team, mostly related to the non-effective workload. This threat was handled by the fact that after completing each part of their task, the student groups reported on their completed work

parts. The presentations were followed by oral and written evaluations by students and instructors as well. In most cases, the students accepted the comments and improved their work, and continued with their assignments.

A definite strength of the course was the collaboration with the municipality, and the opportunity to determine, analyse and refer to real-life problems. The students diligently visited the settlement, carried out on-site inspections, and talked with the residents and local representatives.

A further strength of the course was given by the available SUMP learning methodology, and the use of digital tools, which greatly facilitated the work of both students and instructors during the lectures and consultations, as well as in the phase of the evaluation.

As for the final grades, half of the completed works received an excellent rating, and two-thirds received good rating, which means that students made very good job. There were only 2 groups whose work did not reach the desired level, but this was related to the ability and diligence of the students.

Regarding weaknesses, the relatively short time can be mentioned, but in most of the cases it proved to be enough to conduct a good work (event though it was extensive and demanding for the students too).

5. Conclusion

To sum up the course, it can be established that the pilot testing of the Learning Methodology was successful in Győr, as it was able to reach the following educational objectives:

- introducing an interdisciplinary course exploiting the subject of SUMP and its public participation components;
- offering a unique opportunity to students to come closer to local communities;
- and to make use of digital tools and find a way to make learning engaging.

The course definitely gave a chance to introduce new learning methodologies and update the already existing curricula. One of the biggest advantages can be obtained by providing education that is built upon real economic and social needs. By looking at the completed work of the students, as well as their results, it can be highlighted that participating students were able to learn and understand the importance of urban mobility planning, and how it connects to sustainability. They definitely obtained and analysed deeply the steps that lead to the creation and development of a SUMP. By dealing with real-world problems and offering real solutions to these, students were also able to develop their critical and creative thinking, as well as problem-solving.

Regarding the use of digital tools, students were able to gain new knowledge by using Siftr, in order to analyse and share information about transportation/mobility issues in a specific area. By using ArcGIS, they were able to develop different scenarios for urban mobility issues, and present/visualize their suggestions on a map. Naturally, the UrbanSCOPE tool (the MEES application) that was developed in a later stage of the project can be also a good basis for expanding the list of available digital tools. Furthermore, the elaborated scenarios by the students can also be tested in the MEES application, and see, whether the newly proposed facilities or infrastructure elements are able to modify the route planning, based on different

criteria and variables. Since the testing of the UrbanSCOPE tool was realized during the competition in three countries, the tool is now available for any future courses.

The course was piloted at the Department of Transport Infrastructure and Water Resources Engineering, with civil engineering students, who have a generally good background of urban planning, transportation infrastructure planning and geodesy. As for the transferability of the course, two remarks can be made:

The course itself with the same Department, involving the same level of students is easily replicable. This is already happening at the Széchenyi István University, where the plan is to start a course at 2022/23 autumn semester with the same methodology, for a different case study area. Since the latter one is easily changeable, new concepts can be integrated into the course (for example, other cities, suburban zones, agglomeration settlements, etc.). By already thinking on applying the methodology in further courses, this supports the sustainability.

The course with alterations can be replicable and adaptable for other Departments (not necessarily focusing on mobility and transport), like the Faculty of Business and Economics, or the Department of Regional and Environmental Studies. Naturally, by adapting the methodology to other departments, the focus and/or the depth of the single examination activities needs to be shifted.

Annex 1: List of involved students

The list has been compiled based on the Neptun system, and only contains students officially enrolled in the courses. Due to GDPR, only the Neptun code of the students is listed.

Full time students of the course 2021/2022.

Neptun code of the student	Code	Faculty	Form	Semester
R7P3WA	EKIN_BEO	Civil engineering	full-time	2021/22/1
HAHBAB	EKIN_BEO	Civil engineering	full-time	2021/22/1
KGIUGC	EKIN_BEO	Civil engineering	full-time	2021/22/1
HKEFYF	EKIN_BEO	Civil engineering	full-time	2021/22/1
CJAZSV	EKIN_BEO	Civil engineering	full-time	2021/22/1
UMWSK1	EKIN_BEO	Civil engineering	full-time	2021/22/1
G57GFR	EKIN_BEO	Civil engineering	full-time	2021/22/1
OFE79F	EKIN_BEO	Civil engineering	full-time	2021/22/1
E4JQSW	EKIN_BEO	Civil engineering	full-time	2021/22/1
LT9PPV	EKIN_BEO	Civil engineering	full-time	2021/22/1
AF7B35	EKIN_BEO	Civil engineering	full-time	2021/22/1
M1PXZV	EKIN_BEO	Civil engineering	full-time	2021/22/1
PBUNIK	EKIN_BEO	Civil engineering	full-time	2021/22/1
V3RSQ7	EKIN_BEO	Civil engineering	full-time	2021/22/1
EXQSHX	EKIN_BEO	Civil engineering	full-time	2021/22/1
BUCNGX	EKIN_BEO	Civil engineering	full-time	2021/22/1
A28GB8	EKIN_BEO	Civil engineering	full-time	2021/22/1
UENJL4	EKIN_BEO	Civil engineering	full-time	2021/22/1
E8M00W	EKIN_BEO	Civil engineering	full-time	2021/22/1
O5TRP7	EKIN_BEO	Civil engineering	full-time	2021/22/1
O79C8D	EKIN_BEO	Civil engineering	full-time	2021/22/1
FE1XGQ	EKIN_BEO	Civil engineering	full-time	2021/22/1
EPU8W9	EKIN_BEO	Civil engineering	full-time	2021/22/1

Neptun code of the student	Code	Faculty	Form	Semester
XP8J2D	EKIN_BEO	Civil engineering	full-time	2021/22/1
IZ25AR	EKIN_BEO	Civil engineering	full-time	2021/22/1
NY0I3C	EKIN_BEO	Civil engineering	full-time	2021/22/1
L8VURC	EKIN_BEO	Civil engineering	full-time	2021/22/1
IT8MHJ	EKIN_BEO	Civil engineering	full-time	2021/22/1
HKCHJ4	EKIN_BEO	Civil engineering	full-time	2021/22/1
NDLY26	EKIN_BEO	Civil engineering	full-time	2021/22/1
TX5Q1R	EKIN_BEO	Civil engineering	full-time	2021/22/1
FOHZZE	EKIN_BEO	Civil engineering	full-time	2021/22/1
OIAWW1	EKIN_BEO	Civil engineering	full-time	2021/22/1
AA4S6Z	EKIN_BEO	Civil engineering	full-time	2021/22/1
ZP78AH	EKIN_BEO	Civil engineering	full-time	2021/22/1
XEAIRX	EKIN_BEO	Civil engineering	full-time	2021/22/1
V5BHEY	EKIN_BEO	Civil engineering	full-time	2021/22/1
BV0MLC	EKIN_BEO	Civil engineering	full-time	2021/22/1
YC6KRY	EKIN_BEO	Civil engineering	full-time	2021/22/1
A3LW3F	EKIN_BEO	Civil engineering	full-time	2021/22/1
K0O7ER	EKIN_BEO	Civil engineering	full-time	2021/22/1
NJVJA8	EKIN_BEO	Civil engineering	full-time	2021/22/1
IPCD1Q	EKIN_BEO	Civil engineering	full-time	2021/22/1

Part-time students of the course 2021/2022.

Neptun code of the student	code	faculty	form	Félév
B26CEO	EKIL_BEO	civil engineering	part-time	2021/22/1
HVVAYD	EKIL_BEO	civil engineering	part-time	2021/22/1
D6PHVA	EKIL_BEO	civil engineering	part-time	2021/22/1

Neptun code of the student	code	faculty	form	Félév
HPFF65	EKIL_BEO	civil engineering	part-time	2021/22/1
DFGM3F	EKIL_BEO	civil engineering	part-time	2021/22/1
D7PITG	EKIL_BEO	civil engineering	part-time	2021/22/1
MSPKOA	EKIL_BEO	civil engineering	part-time	2021/22/1
BW5QJW	EKIL_BEO	civil engineering	part-time	2021/22/1
WVKTF3	EKIL_BEO	civil engineering	part-time	2021/22/1
B330M6	EKIL_BEO	civil engineering	part-time	2021/22/1
W1KIP7	EKIL_BEO	civil engineering	part-time	2021/22/1
LCJC3D	EKIL_BEO	civil engineering	part-time	2021/22/1
IFF62D	EKIL_BEO	civil engineering	part-time	2021/22/1
G39XXP	EKIL_BEO	civil engineering	part-time	2021/22/1
DRAFBM	EKIL_BEO	civil engineering	part-tim0e	2021/22/1
NEEBLI	EKIL_BEO	civil engineering	part-time	2021/22/1
MBO2LP	EKIL_BEO	civil engineering	part-time	2021/22/1
UT2TGY	EKIL_BEO	civil engineering	part-time	2021/22/1
WUE919	EKIL_BEO	civil engineering	part-time	2021/22/1
CIFNUL	EKIL_BEO	civil engineering	part-time	2021/22/1
T553LJ	EKIL_BEO	civil engineering	part-time	2021/22/1
PVUKRB	EKIL_BEO	civil engineering	part-time	2021/22/1
GYGADP	EKIL_BEO	civil engineering	part-time	2021/22/1
ZLFF3N	EKIL_BEO	civil engineering	part-time	2021/22/1
JZII62	EKIL_BEO	civil engineering	part-time	2021/22/1
Y7Y7IB	EKIL_BEO	civil engineering	part-time	2021/22/1
DIP826	EKIL_BEO	civil engineering	part-time	2021/22/1

Annex 2: Determined case study areas during the SUMP-course