



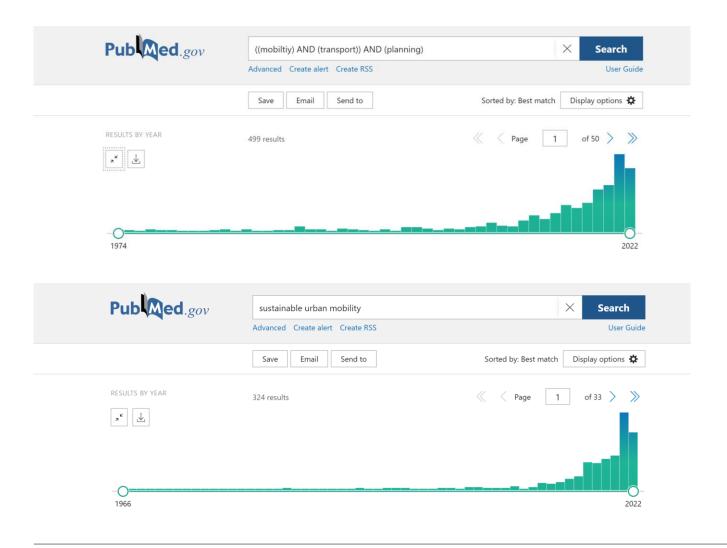
### Content



- Why a learning course on SUMP for university students?
- Creating a SUMP course
- Pilot testing the course
- The Results
- Evaluation and outlook



# Why a learning course on SUMP for university students?



Mobility / Transport / Planning / SUMP
Are fields of research which recently started to grow exponentially in the past ten years.

This research panorama is interdisciplinary, meaning that many disciplines tackle the field from different perspectives.

Some of the disciplines that are very active on the field are:

- Health and medical disciplines
- Sociology
- Transport Engineering
- Political Sciences
- Economics
- Architecture and urban studies



# Why a learning course on SUMP for university students?

On the past ten or fifteen years, architecture schools developed an increased research orientation (Ammon/Froschauer 2013). Nevertheless, <u>design architects rarely publish in scientific journals, as the manner in which they are accustomed to presenting their findings is hardly text-based (Silberberg, J. 2021)</u>

Most of architecture schools struggle establishing a connection between the research and the design within their curricula. In addition, most architecture schools struggle with adopting or creating methods to do such research, facing the conflict of having to produce knowledge through standard, universal, general methodologies and procedures, since the tradition of such schools is teaching the production of architecture though individualism, self-creation and non-reproducibility.

In this sense, it is important to reinforce research on the curricula of ongoing architecture students to continue to understand <u>what does research means for architects and planners</u>, how to apply it and which benefits could bring to this profession.



Architecture students are the future urban planners of our cities.

SUMP = Theory and Praxis

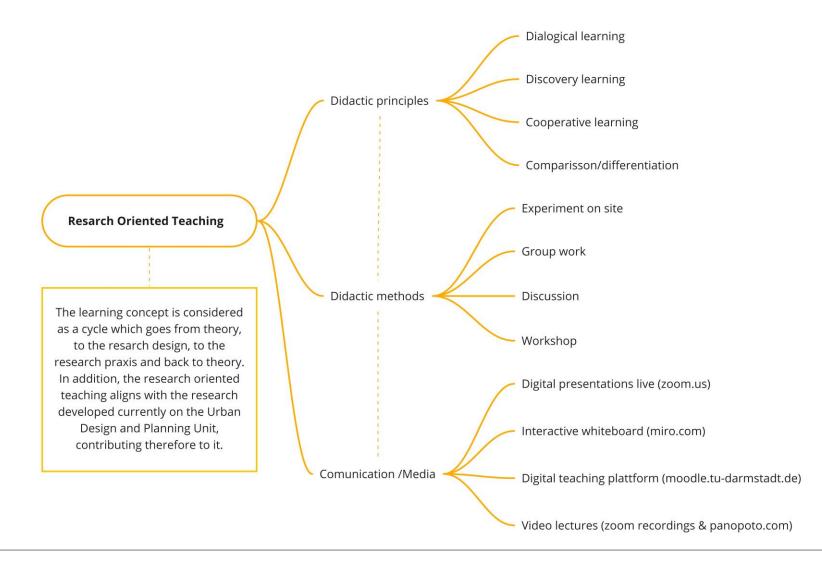


# Why a learning course on SUMP for university students?

Design in Building Construction Students deepen their understanding of urban complexity in terms of social, Design in Urban Planning economic, ecological, cultural and historical Subject module in History dimensions. They acquire in-depth Subject module in Desing knowledge of the typology of European cities and Subject module in Building Planning and the differences to city types in other and gain insight into current changes and Construction transformation processes of urban systems. Subject module in Urban Planning -Master of Science in Architecture Subject module in Building Technologies Technical University of Darmstadt Research Module **TECHNISCHE** Elective modules in History, Design, UNIVERSITÄT Civil Engenieering Construction, Building planning, Urban Planning, DARMSTADT SUMP Course **Building Technology** Sociology Master thesis in building construction or urban planning Economy Geography



### **Creating a SUMP Course**





### Creating a SUMP Course



### Learning Objectives

- To understand and apply the concepts and processes of urban sustainable mobility planning through developing a self-initiated research project on a real case-study.
- To apply different research methodologies used in urban planning by collecting empirical data, targeting a certain hypothesis related to mobility problems in cities.
- To learn about and apply <u>digital tools for analyzing</u> <u>mobility issues in cities</u> (augmented reality tools, mapping tools, etc.).
- To identify and understand the different elements that can affect (negatively and positively) the sustainable urban mobility using the "15min city" as a successful model.



### **Creating a SUMP Course**



- Theoretical input Lectures / Readings / Discussions
- Practical input Workshops and critics together with the city planning office of Wiesbaden
- Self-developed project GROUP work related to a research on the topic of urban sustainable mobility

	FB15 – FG Entwerfen und Stadtplanung / FB13 – Institut für Geodäsie, FG Landmanagement	
Format	Seminar + Project work	
Credit points	3 ECTS / 3 credit points	
Language	English / Deutsch	
Plattforms	Moodle, Miro Board, Zoom	



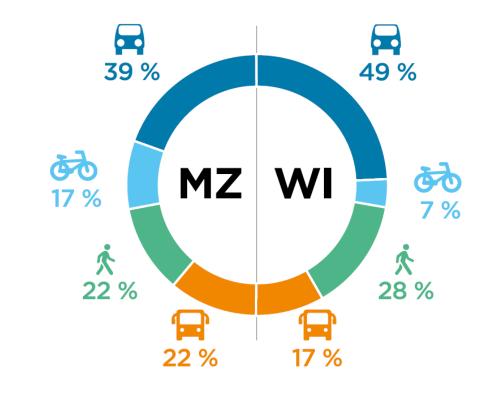


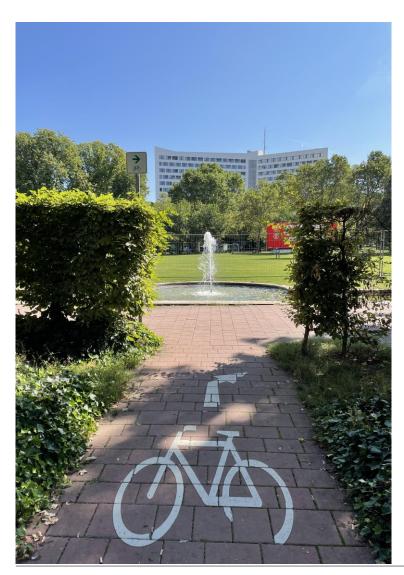


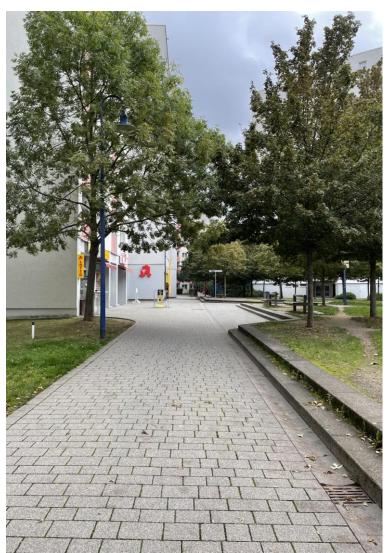
# The City of Wiesbaden

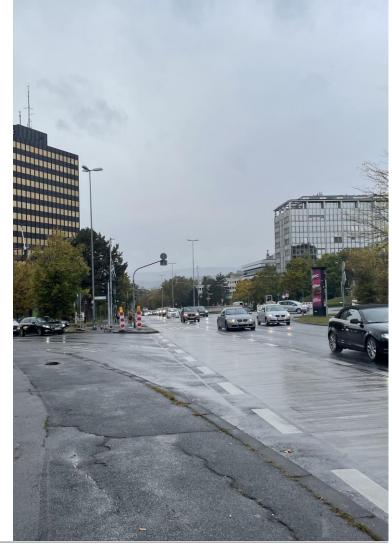
- City in the 3<sup>rd</sup> place for congestion index in Germany, and with an increasing high rate
- Monofunctional city: spatially separated areas for living, working, shopping and culture.
- Car-oriented development: less priority given to public transportation, pedestrian and bicycle infrastructure.
- Car-oriented mobility culture
- Yet, new developments are arising, where research could help to understand the current challenges and potentials.

### Anteil der Verkehrsmittel an allen Wegen











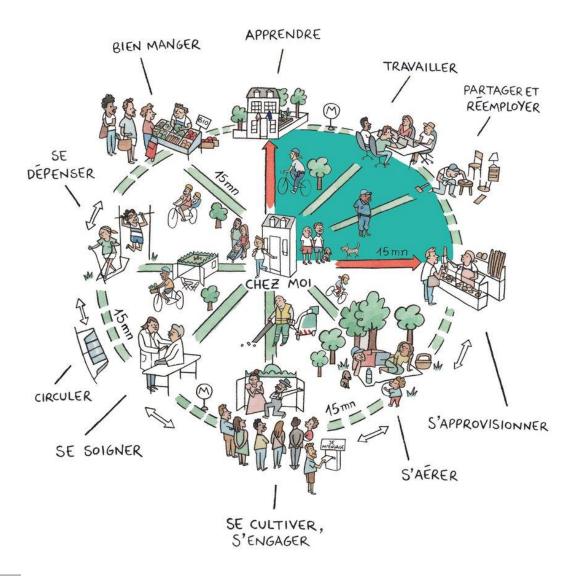
### The tasks

### LE PARIS DU 1/4 HEURE



Pick 2 areas (1.5km radious/ 15min walk) in order to compare the following:

- Land use mixture though mapping and analyzing existing uses on the area.
- Walkability and cycle infrastructure though analysis of walkability and an evaluation of the existing cycle infrastructure
- Design diversity though an analysis of the quality of the architecture, landscape and urban design
- In addition, students will formulate a specific research question related to a specific topic/focus of interest of the group





# Pilot testing the course

### Time plan

Date	Time	Topic
19.10.2021	10:30	Lecture 1: Sustainable Urban Mobility Planning – the 15 min city concept - GVF
26.10.2021	10:30	Lecture 2: Analyzing the mobility situation – Methods in Urban planning - FG
27.10.21	10:00	Excursion to Wiesbaden – Together with the design students - FG + GVF (Optional)  More information will be provided
02.11.2021	To be decided	Lecture 3 / Workshop: Mapping Techniques – GIS – Land use management – GVF / Prof. Linke
09.11.2021	10:30	Lecture 4: Access ibility and Inclusion – an important pillar in SUM - GVF
16.11.2021	10:30	Lecture 5 + Critic 1: City of Wiesbaden – current planning practices by Stadtplanungsamt Wiesbaden
23.11.2021	10:30	Project Work: open time for questions and answers Time for the students to continue working on the field gathering empirical data
30.11.2021	10:30	Project Work: making sense of the data + future recommendations Time for the students to continue working on the field gathering empirical data
07.12.2021	10:30	Project Work: Open time for questions and answers Time for the students to continue working on the field gathering empirical data
14.12.2021	10:30	Final presentation and submission of the posters





Künstlerviertel "im Rad"

### The Results



1.4% Octors 0.9% most 1.4% to 0.8% mosts 0.2% todayer 0.3% to 1.2% automy 0.2% bitsel / Hindeporder

Walkability

For analysing the 15-minutes-city nalysis and sustainable urban me bility (walkability and bikefriendlyinfrastructure) we picked the Kureck Quartier due to its inner-city location

building typologie mixture. The Quartier is a mixed-use neighbor

Most of its usage is residential, but also Ground floors are often used different ly than upper floors, which are frequently used for residential purposes

different uses strengthen the 15 minute

existing green areas and cultural offers

many commercial facilities which are not accessible for all classes of society

Many different need satisfactory offers

are accessible within a brief amount of

time. There are open spaces reserved

only for pedestrians, such as parks and

Lively around floors and streets provide

complicates the pedestrians' mobility

Cycling in the city centre of Wiesbade

is unfortunately very limited. Marked

cars or at a bus stop. That's why many

which is forbidden, but safer for them.

ans and a clear critique to the lack of a

Insufficiently safe and developed bike-Missing bike storage

04

8 0

98

Which is a disadvantage for pede

Existing bike sharing offers

cycle paths are rare. A lot of cycle

paths end suddenly behind parked

a varied and interesting design

a pedestrian zone.

Traffic noise pollution Topography in the residential area

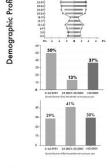
pedestripo walkway



dential uses. schools are provided

Only specific stores, one has to leave the neighborhood for many needs 0.0% stand 0.2% stands 0.4% statem 0.4% stands

#### Our second focus area is the Künstler viertel im Rad. The area is a relatively new planned and constructed area which was completed in 2006. In comparision to the grown structures in the old city center the infrastructure and n the Künstlerviertel is expected to be The Künstlerviertel is a neighborhood with a high proportion of diverse resi-Facilities such as kindergarten and nclusive housing for elderly is offered Quiet neighborhood and playground within walking distance Scarce facilities encouraging the cultural



was used. Residents were approached on a personal basis

the survey in person or scan a QR code to fill it out online.

Questions 1-4 aim to provide

based on the answers of the

residents.



Kureck Quartier

Based on our impressions com-bined with the results of the land

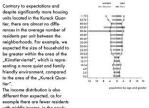
use and mobility analysis, we have expected differences with

the social demographic aspects. But who actually lives in these



6,420 total population 4,898 total population

41% total male populati



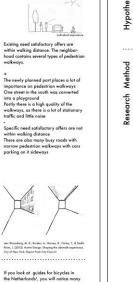
planned neighborhood.

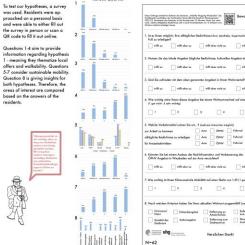
Research Question: Therefore, the main question is whether the concept of the 15-min city as well as the quality of sustainable mability and the demographic profile of the residents in the analyzed area are related. Thus, are the benefits of the 15-min city important for the choice of district for the residents? Derived from the analysed graphics, reaving similar household sizes, income, and age distributions

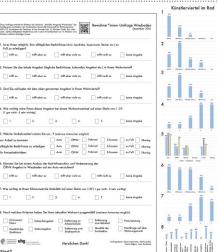
I. The accessibility of daily needs by foot...

II. The usability of sustainable transportation (bicycle, public transportation, walking)

plays a minor role in choosing one's place of residence.







The answers from questions 1-4 suggest that residents assess the walkability mainly to be on a positive level. Here it has to be kept in mind that needs of each person can vary and hence have to be considered with caution.

The questions 5-7 suggest the area specific differences. Although, the car is the main transportation mean in both areas, more people living in the Künstlerviertel seem to be able to renounce from it compared to residents from the Kureck Quar tier. In general, the conscious for limate-neutral mobility seems to be higher among the residents of the Künstlerviertel.

Concluding, the reasons for choice of residential area seem to vary a lot. It is suggested that being close to the city center plays a major

1. Descriptive results from question 4 and 8 suggest the accessibility by foot to play a major role for the residents. Therefore, hypothesis one has to be rejected

II. Even though the Kureck Quartier and the Künstlerviertal are located in different parts of the city and the offers differ a lot (see land use analysis), results based on descriptive values of our survey do not show a difference in usage of transportation means. Cars one the national used mean of transportation, whereas public transportation and biking plays a minor role. Even if bike lanes and public transportation are improved, not many people could or would want to stoy using fietric or. Thus, we can access thy publishes 2.



Climate Work Co-Working Spaces

as transportation mean to get residents for climate-neutral to work, we see potential in immobility is in need of realistic proving and providing flexible goals and incites.

Housing Affordability + Efficiency

more households with greater income live within the Kureck

Quartier. The area is in par

Co-Working Spaces As many people need their car The sen or strongportation mean to get to work, we see potential in im-proving and providing flexible work environments.

Work

Climate

Culture

More Quality The quality of free spaces and the usability of those can be improved through design and increases offered activity

Nature

**TECHNISCHE** UNIVERSITÄT DARMSTADT

Group 1 | Mertcan Bal, Sevan Demircian, Lena Kirchhain, Karim Elghor

street not reconvended for cyclin

WiSe 2021/22 | Künstlerviertel "im Rad" | Kureck Quartie

deficits in Wiesbaden. While in Holland

there are many signposts, coloured cyc-

le paths and a working cycling network

many intersections and traffic circles

Bike sharing offers are available in a

A lot of stationary traffic results to safe

road network and are not developed in

combination with public transportation

where crossing is dangerous.

### The Results

### Mapping the mobility network of inner Wiesbaden Relevance of the topic - STUDY: Identifikation von typischen Bewegungsorten von 2-10 jährigen Kindern, und Epidemiologie (BIPS), 2016-2018 | - Children with - 2km way to school are more likely to reach WHO's recommendation. Research perspective: Children (age 6-11) Research approach Research areas: Bahnhofsquartier Biebrich and Künstlerviertel "Im Rad" Research focus: Primary schools in the area, school routes and their safety for children Mode of Transport: walking, cycling 🕴 🚴 Research Goal: - Analyzing strenghts and weaknesses of the mobility infratsructure of both areas - Make suggestions for improvement und Epidemiologie (BIPS), 2016-2018 - whildren with > 2km way to school are more likely to reach WHO's recommendation > active school ways influence children's health of the year than others (november: visuability?) Research question: "How could the city of Wiesbaden - STUDY: Studie zur Gesundheit von Kindern und Jugendlichen in Deutschland (KiGGS), Robert-Koch-Institut, 2003 - 2017 improve its mobility network to provide their children active, safe Robert-Roch-Institut, 2003 - 2017 - accidental injuries are the most common cause of death for children(> 1 year) in Germany - accidental injuries can cause significant and lasting damage to health and development - it is important to promote accident prevention and independent school routes? emplary study of the routes to school exemplary study of the routes to school by children of the primary schools Otto-Stückrath-Schule (Wiesbaden Biebrich) and Friedrich-von-Schule (Wiesbaden Biebrich) and Friedrich-von-Schule (Wiesbaden Künstlerviertel "Im Rad") on active, parents-undependend routes by bicycle and on foot. - STATISTICAL REPORT: Verkehrsunfälle, Kinderunfälle im Straßenverkehr 2019, Statistisches Bundesamt, 2020 3 Analyzis of GIS-Data Research and countings on site > Active school ways important for children > But; currently include risks and dangers Land uses: Künstlerviertel "Im Rad" Bahnhofsquartier Biebrich + quiet and family-friendly strength + huge public park with a castle + nearby the river Rhein "Kalitluftschneise" + many hotels at the river tourists challenges - industrial area in the west - Appelallee divides the area, dangerous for children strength + accessible with bikes or by foot (flat altitude) many social infrastructures like nursery and community center + many green areas + many sport center and pitch many cars on the street difference between detached houses (single garages) + many sport center and pitch + playgrounds around school + school zone with 10km/h + residential areas with sheltered housing + supermarkets, baker, hospital, doctors nearby + new apartment building, underground garage + street is separated for cars, bikes and - some green area in the west which is not actively used and apartments (collective garage) - only a few playgrounds - school next to sewage-works (Klāranlage) - big street (Dotzheimerstr. and Loreleiring) with 50km/h + allotments + some doctor's surgery - many car service stations - few qualitative restaurants and cafes Mobility uses: > Künstlerviertel provides more safe crossings then Biebrich >... provides more streets with tempolimit 30 km/h



> ... provides more Schleichwege with a green score

#### School routes: Otto-Stückrath-Schule

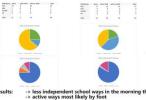


#### Friedrich-von-Schiller-Schule



Midday: 12.45 - 14.45 h

#### Mode of transportation Midday: 12.45 - 14.45 h



> children which have to cross the street next to the school are more often accompanied by an adult traffic light in front of the school

s tranti light in front of the scho is often used => shortest way most children with an actice school way walk, few children take the schooter or bike

### Comparison: > pedestrian friendlier (traffic light, zebra stripes), streets less

dangerous to walk,
> children less likey to go by bike
=> short distances?
=> bycicle infrastructure unsafe?

> more bike/scooter and same car => children come from further away? => neighborhood less nicely to walk by?

-> less active school ways in the morning then at midday -> less active school ways in Künstlerviertel then in Biebrich

Morning: 7.15 - 8.15 h

#### Traffic environment analysis



### Results from analysis:

> Residential land uses along the school routes in

More greenspace and mixed uses on the school routes in Künstlerviertel than Biebrich.

>Children by bike are often accompanied ->bike more dangerous? >not every kid is allowed to walk alone

> most children with an actice school

Comparison:
> less pedestrian friendly, more children with parents (parent taxis)
=> the anxiety of parents influence the independence of school routes for their kids

way are walking

> A lots of parked cars on the street in Biebrich.

More safe crossings in Biebrich than Künstlerviertel. Not enough safe crossings in Künstlerviertel.

> Künstlerviertel is scored as positive in Schleichwege System. In Biebrich the streets are scored with middle-good. > Biebrich and Künstlerviertel have both similar

=> Even though many of school routes are official and they are fine for adults - can be dangerous or not enough organized from children's perspective. We concluded that some points should be corrected

#### Exemplary school routes:



A + walking groups + parents educate active school ways

> provide wider pavements

> tempo limit 10km/h at Carla-Henius-Straße > dead end/traffic light burger Straße around school

adjust the traffic lights at
Karlsbader Platz

despite partial risks in road traffic, many children take an active way to school
 many children are accompanied by parents, especially in the the morning
 most active school ways are taken by foot
 both areas are mostly oriented on car infrastructure in the children and frastructure for children's fillenged as reported everywhere and exist from a parks designed safe
 special control or speci

### **Evaluation and Outlook**

How was this course different from others?

How was the cooperation in the interdisciplinary teams?

What problems arose within the course? And how did you solve them?

interdisciplinary scientific methods

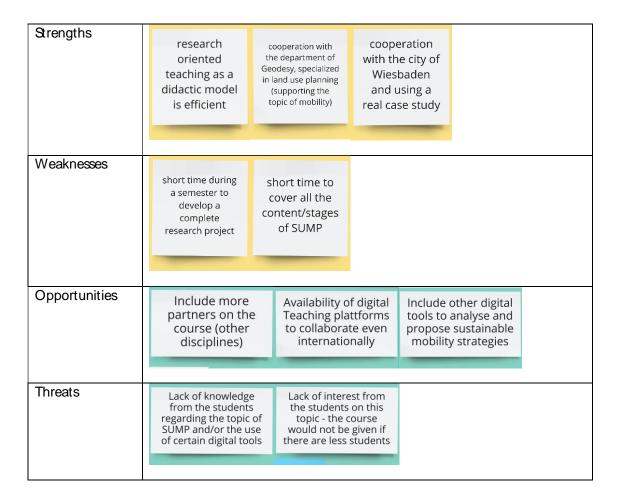
urban mobility research analytic approach

communications
data arcgis
land use
different approach
collaboration
difficulty

organization
site data
communications
constant meeting
group size
digital kuhle



### **Evaluation and Outlook**



### **Transferability**

The pilot course tested at the Technical University of Darmstadt, Department of Architecture, Urban Design and Planning Chair, was <u>further developed in another format, namely a design studio</u>. In this further development, the students worked with the same city (Wiesbaden), to design a new complex of mixed uses, being mobility one of the important aspects of the design. In this sense, <u>the results of the seminar</u> (Mapping mobility of Wiesbaden) were transferred to the design studio students and were useful as a first analysis of the area. Some of the students were taking part of both classes (the seminar and the design studio) and profited even more from the content of both courses.

This example can serve as <u>a pilot test for transferability</u>, <u>in which two or more classes take advantages of the synergies</u> and cooperate to work with the same partner (in this case the city of Wiesbaden), the same area, but with a different focus, complementing each other.



### **Closing Remarks**



As part of the sustainability, it is recommended to <a href="mailto:embed this seminar related to SUMP into the learning program for architecture students">embed this seminar related to SUMP into the learning program for architecture students</a> since it is a very important and currently a main topic for city planners. Ideally the seminar should be offered minimum once a year, in winter semester when the number of students is greater. The Chair of Urban Design and Planning could apply yearly for <a href="mailto:funding">funding</a> (local or international, as the Erasmus + Program) to cover the expenses for the instructor of this course and material needed.





