





# Designing habitats and infrastructures

Our habitat is a valuable commodity that requires careful handling: we need to meet the needs of present and future generations, taking into account our limited natural resources.

Settlement areas are expanding worldwide and the trend towards greater urbanisation remains unabated. At the same time, the magnitude of natural hazards is increasing. These global developments require ever greater efforts in the construction of new infrastructures and the maintenance of existing ones, as well as a more economical use of the natural and largely limited resources of soil, water and air. Successfully meeting these challenges requires sound expertise and the ability to use effective methods and instruments. The profession is looking for experts who can undertake engineering design tasks targeting the sustainable development of our habitat.

## **Sound education for attractive professions**

The Master's programme in Spatial Development and Infrastructure Systems offers a broad, university education and a great deal of practical relevance for aspiring professionals who want to take on complex global and local tasks in spatial and infrastructure development. The programme enables students with different professional backgrounds to develop a common language and a common understanding of methodology to develop integrated solutions for sustainable spatial and infrastructure development.

With a Master's degree in Spatial Development and Infrastructure Systems, career prospects are excellent. Challenging and diversified employment opportunities beckon – for example in consultancy offices, with transport operators, infrastructure providers, construction and real estate companies, banking and insurance companies, as well as with municipal authorities, local, cantonal or federal government. Careers in research and development are equally attractive, either at a university or a research institution.

This Master's programme is offered by the Department of Civil, Environmental and Geomatic Engineering at ETH Zurich. Teaching is mainly carried out by the Institutes of Spatial and Landscape Development, Transport Planning and Systems, and Construction and Infrastructure Management, supplemented by specialist lectures from other institutes and departments of ETH Zurich. ■

# The Master's programme

The Master's programme in Spatial Development and Infrastructure Systems offers an interdisciplinary, university education for planners and managers working in the field of the built spatial environment and associated infrastructure systems.

## Admission

A Bachelor's degree in Geospatial Engineering from ETH Zurich entitles the holder to unconditional admission. Anyone who has obtained a Bachelor's degree in a qualifying field of study and fulfils the performance-related requirements may also be admitted to the programme. The minimum formal requirement is a Bachelor's degree with at least 180 ECTS credits or an equivalent degree.

## Language

All compulsory subjects are taught in English. In the specialist and elective subjects, some of the courses are in German, others in English. It is generally possible to complete the programme in English. It should be noted, however, that subjects relating to Switzerland are offered in German, especially in the field of spatial and landscape development. This mainly concerns lectures in the field of spatial planning, law, design, site and project development and regional economics. Information on the language

of the individual lectures can be found in the course catalogue at [www.vvz.ethz.ch](http://www.vvz.ethz.ch).

## Duration of study

The Master's programme in Spatial Development and Infrastructure Systems is a full-time programme and leads to the academic title Master of Science ETH in Spatial Development and Infrastructure Systems (MSc ETH SD&IS). For the Master's degree 120 ECTS credits are required, with one credit typically corresponding to 30 hours of study.

The Master's programme at ETH Zurich begins in autumn and usually lasts four semesters. One academic year comprises two semesters, each lasting 14 weeks.

The Master's degree must be obtained within four years. ■



# Content and structure of the programme

Together with a tutor, students put together their individual course plan, which takes into account their personal expectations and talents, while at the same time guaranteeing a practice-oriented education.

The Master's degree programme comprises compulsory courses, specialist courses and elective courses. In addition, there is a mandatory semester paper in the form of interdisciplinary group project work. On conclusion of the course, students write a Master's thesis in their final semester which leads to the degree.

## Compulsory subjects

The compulsory subjects form the basis for the Master's programme and provide students with the key contents of the department as well as basic knowledge and skills in scientific work.

## Specialist subjects

Students can consolidate their knowledge in the following three areas: Spatial and Landscape Development, Transport Systems and Behaviour, and Network Infrastructure. The choice is free and made in consultation with the tutor.

## Electives

Electives from various subject areas complement the specialist knowledge acquired. The entire curriculum of ETH Zurich and the University of Zurich is open to students. The acquisition of at least two credit points from the course programme "Science in Perspective" is obligatory.

## Interdisciplinary project work

Interdisciplinary project work is a key component of the Master's programme. It is offered once a year in the Autumn Semester. Working in groups, students deal with a complex issue that goes



beyond subject boundaries. The main aim is to encourage students to consider and plan housing developments, landscapes, traffic and infrastructure in an integrated manner. The project work is coached by the professors on the course.

## Master's thesis

The Master's thesis is to be completed within 16 weeks and covers four months of the students' final semester. The thesis explores a topic taken from one of the three faculties, with individual coaching provided by one of the professors. ■



## Master's programme in Spatial Development and Infrastructure Systems

1st to 3rd semesters	ECTS credit points
Compulsory subjects	21
Specialist subjects	51
Interdisciplinary project work	16
Electives	12
<b>Total 1st to 3rd semesters</b>	<b>100</b>
4th Semester	ECTS credit points
Master's thesis	20
<b>Total 4th Semester</b>	<b>20</b>



# Areas of specialisation

A wide range of specialist subjects is on offer for the student in the specialist areas of Spatial and Landscape Development, Transport Systems and Behaviour, as well as Network Infrastructure.

## Spatial and Landscape Development

Spatial and Landscape Development deals with the planning and development of landscape and space, taking into account ecological, social and economic aspects. Solutions for current issues at national and international level are developed, planning decisions prepared and appropriate processes designed. Students learn the fundamentals, concepts, methods and skills that will enable them to recognise, clarify and resolve spatially significant issues with the involvement of people and bodies from society, the environment and business.



## Transport Systems and Behaviour

Transportation Systems and Behaviour consists of the three areas of traffic planning, traffic systems and traffic engineering. This involves the analysis, design and operation of transport systems on roads, railways and in the air, as well as the most significant effects on investment, generalised costs, transport connections and other external factors. Automation, climate protection and globalisation are also intertwined with transport. Where will we live and work in the future? How will we get around?

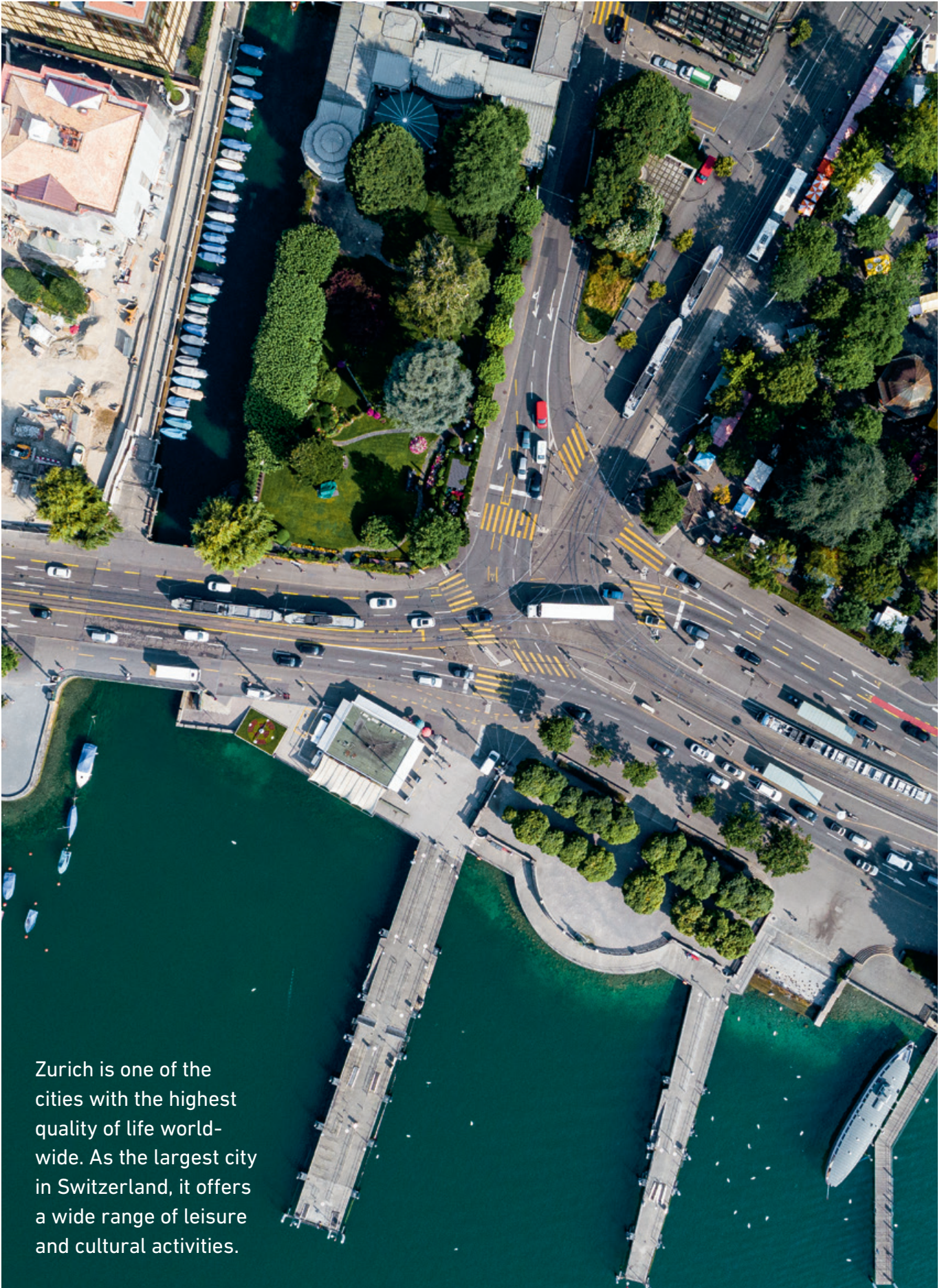


## Network Infrastructure

Network infrastructure, such as water supply and wastewater disposal systems, transport routes and power grids, must be tailored effectively to meet society's needs, operated efficiently and maintained sustainably. This specialisation consists of the three interlocking topics of decision making, system modelling and management. The aim is to develop future managers who, by making competent decisions, will ensure that the infrastructure is managed for the maximum benefit of society. The objective of the subject area Network Infrastructure is the training of future infrastructure managers to make competent infrastructure management decisions for the maximum benefit of society. ■







Zurich is one of the cities with the highest quality of life world-wide. As the largest city in Switzerland, it offers a wide range of leisure and cultural activities.



# Living and studying in Zurich

Studying at ETH Zurich can be demanding and time-consuming – but also varied and exciting. If you organise your studies well, you will certainly have time to cultivate personal interests.

## Leisure and culture

Zurich is one of the cities with the highest quality of life worldwide. As the largest city in Switzerland, it offers a wide range of leisure and cultural activities. Its location on the lake and its proximity to the mountains make Zurich a popular starting point for water sports and alpine leisure activities. Famous places in the Alps such as Pilatus, Säntis, Rigi and even the Jungfrauoch can be reached in a short time.

## Sport

Anyone who enjoys sports or simply wants to keep fit is in good hands with the Academic Sports Association of Zurich [www.asvz.ethz.ch](http://www.asvz.ethz.ch). The ASVZ offers over 120 types of sports activities and is one of the largest sports associations in Europe. Most halls, facilities and courses are free of charge for registered students.

## Clubs and associations

The Geomatic and Environmental Engineering Association (GUV) [www.guv.ethz.ch](http://www.guv.ethz.ch) is not only involved in higher education po-

lity, but also in organising social and professional events such as cocktail receptions, excursions and ski weekends. The ETH VSETH Student Association [www.vseth.ethz.ch](http://www.vseth.ethz.ch) is more broadly based and represents the interests of all students vis-à-vis the university – and has done so for 150 years. It also provides its some 10,000 members with function rooms and music rooms, it runs a film department, organises parties, publishes its own magazine and offers a wide range of opportunities for active participation in its committees.

## Accommodation

Students can find assistance in the search for accommodation with the Housing Office of the University/ETH Zurich [www.wohnen.ethz.ch](http://www.wohnen.ethz.ch), at the Woko [www.woko.ch](http://www.woko.ch) which also arranges places in shared apartments, or with Livingscience [www.livingscience.ch](http://www.livingscience.ch) which manages the student rooms on the Hönggerberg campus. ■



# Students share



**Tabea Eckert**

"Through my Bachelor's degree in geography and the minor in spatial and transport planning, I had already taken a liking to topics such as settlement and environmental planning. The Master's degree in SD&IS enables me to pursue these interests through a wide range of subjects and gives me the flexibility to pursue a second job. In addition, I appreciate the numerous project work, which not only provides practical relevance, but also ensures a varied everyday life at the university."



**Andreas Farner**

"The way we as a society perceive, plan and build on space really fascinates me. The SD&IS programme gives me the necessary opportunities to understand these processes and to be able to develop sustainable solutions for the complex challenges of our time. The course has a great deal of flexibility and diversity and this allows me to pursue different interests and find out where my personal path is taking me."



**Marianne Gatti**

"I am impressed with the Master's programme in Spatial Development and Infrastructure Systems because of the opportunity to specialise in the field of spatial planning in an interdisciplinary environment. ETH Zurich supports us in achieving our personal goals, but this also requires students to show initiative. What I like best is the choice from a wide range of subjects and the possibility of spending a semester abroad."



**Jens Fischer**

"The SD&IS Master's programme is an ideal complement to my Bachelor's degree in architecture. Besides spatial planning design, I learn how GIS data, point clouds and programming can be combined to solve spatial issues. Various projects have enabled me to work together with students from other fields and to consolidate my own areas of interest. What I particularly like about this small course is the close supervision provided by the lecturers, all of which contributes to a supportive learning climate."



# Professors expect

## Prof. Dr. Bryan T. Adey

"I expect our students to be driven by the desire to create optimally sustainable environments in which people will live, work and play over generations. That they also have the resolve to build their own toolkit to equip themselves to deal with the most complex interdisciplinary planning problems, spanning the fields of spatial and landscape planning, transport systems and behaviour, and network infrastructure. They should have an unbounded enthusiasm to not only master the state-of-art, but to become leaders in a new age of spatial development and infrastructure systems."



## Prof. Dr. Kay W. Axhausen

"I expect our graduates to have made targeted use of the courses on offer and to have developed into solid engineers and planners. Our environment and the way we use it are changing ever more rapidly. I expect students to want to understand, influence and shape these changes and to acquire specialised knowledge to do this. An important signpost to this end are the discussions with the tutors: the range of courses is broad and a targeted course selection requires thorough consideration and careful planning. Depending on student interests, it is possible to put together a highly specialised or broad-based course of study."



## Prof. Dr. David Kaufmann

"I expect our students to burn with curiosity for complex spatial issues. Students should be motivated to consider just how spatial development and urbanisation processes can be shaped in the future. It is necessary to deal with different intellectual traditions and interdisciplinary theories and to learn new research methods. All this should enable students to deal normatively and empirically with fundamental questions of power, sustainability and social justice in planning."



“The teaching of an interdisciplinary, solution-oriented, creative mindset and competence is in my opinion the strength of the SD&IS Master’s programme.”

**Manuel Fernandez**  
Real estate consultant, Wüest Partner



Manuel Fernandez

## The real estate consultant

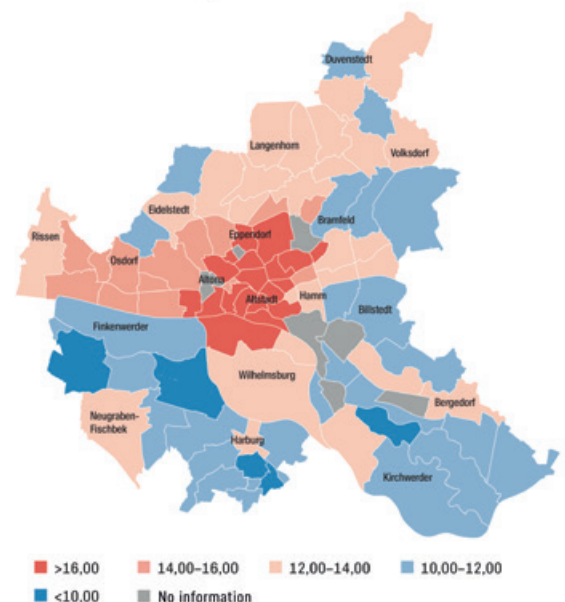
In my work as a consultant at Wüest Partner, I am confronted with complex issues covering the entire spectrum of built space on a daily basis. This embraces consulting and evaluation activities on economic issues relating to existing real estate and real estate portfolios as well as issues in the field of spatial development.

These include, for example, monitoring study contracts, developing utilisation concepts or evaluating various project and development scenarios for our clients.

What attracts me to my work is the wide variety of challenging projects and mandates, which vary greatly depending on the clients – from private individuals to institutional investors, from charitable foundations to public authorities. After my Bachelor’s degree in architecture, the Master’s programme in Spatial Development and Infrastructure Systems has allowed me not only to broaden my focus to include a larger urban development scale, including engineering aspects, but also to attend individual lectures at the Department of Architecture.

Lectures such as site and project development, statistics, basic principles of natural hazard management, flood protection, the history of urban development, pedestrian and bicycle traffic and especially the interdisciplinary project work combine a scientific, data-based working methodology with creative design in built space. In my opinion, teaching an interdisciplinary, solution-oriented, creative way of thinking and competence is the strength of the SD&IS Master’s programme. ■

**Rent HY1 2020 (average rent €/m<sup>2</sup>/month)**





“In collaboration with colleagues from the most diverse specialist areas, I can benefit from the interdisciplinary nature of the programme. The varied courses have also prepared me well for my typical working day, in which I work on a whole range of different projects.”

**Anne-Kathrin Bodenbender**  
Traffic planner, Rapp Group



Anne-Kathrin Bodenbender

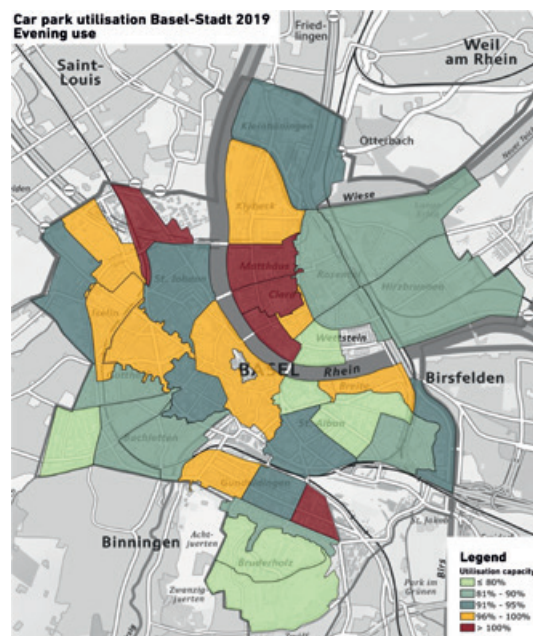
## The traffic planner

I work as a traffic planner for Rapp in Basel. We are one of the leading Swiss planning and consulting companies and develop sustainable solutions for the design of residential areas and the built environment. There, I deal with the most diverse facets of traffic.

I prepare traffic reports, e.g. within the scope of environmental impact assessments, advise companies on the subject of mobility management and create traffic models which are then used in planning issues.

What fascinates me about traffic planning is that it is a technical discipline that is very much shaped and influenced by human behaviour. We have to plan roads, public transport networks and cycle paths today that will still serve their purpose in ten years or more, while people's behaviour can and will change significantly in the future.

During my studies, I benefited above all from insights into a very broad range of disciplines and their interplay. This interdisciplinary work and thinking outside the box in my own field of expertise is a regular requirement of my professional life. After my Bachelor's degree in Geomatic Engineering and Planning (today Geospatial Engineering) I decided to do an internship in traffic planning. This work convinced me to continue my studies and take the Master's degree in SD&IS. ■





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