Zeitschrift: Pamphlet
Herausgeber: Professur für Landschaftsarchitektur, Christophe Girot, ETH Zürich
Band: - (2022)
Heft: 26: Probing Zurich

Artikel: Bridging the river Sihl : bridges as public spaces in the dense city of Zurich
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DOI: https://doi.org/10.5169/seals-1041717

BRIDGING THE RIVER SIHL

Bridges as Public Spaces in the Dense City of Zurich

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Bridging

Unlike almost any other structure, bridges are the culmination of engineering achievement, architectural aesthetics, and spatially as well as temporally unifying functions. As Isabelle Fehlmann, historian and landscape researcher, explains, bridges can be read as a structural symbol of their time:[1] a symbol that expresses function, forms of mobility, and technical progress. Bridges are narrowing passages for getting from one side to the other. Narrowing entails the need for regulation, order, and thus also hierarchization. The different traffic participants and their particular speeds and ways of moving are a challenge in bridge construction. Which function is the most urgent one; which traffic group is most important? These are questions that decisively shape the design of the bridge and express negotiations about the use of public space.

The city of Zurich has built or planned only a few new bridges in recent years. The most impressive one is probably the Negrellisteg, opened to the public in spring 2021. It crosses the tracks at Zurich's main railway station and creates a new connection and a unique viewing platform for pedestrians above the tracks between the city districts 4 and 5. Another example is the replacement of the Rathausbrücke. This is currently being planned as a new construction to meet the requirements for flood events with fewer supports. The area of the bridge will increase and allow for more flexible use. An interesting example of a conversion of existing infrastructure is the viaduct path on the former tracks of the Swiss Federal Railways (SBB), which was realized in 2008. This path connects two city districts over the River Limmat and will be extended over the existing tracks to city district 4. A competition for its design is currently underway.

Public Space as a Key Element of Urban Development

The municipal master plan (*Richtplan*), approved by the population in a referendum in November 2021, sets new parameters for how

Fig.4 River Sihl, Zurich 2019. Birdseye view of the Sihlhölzlibrücke: traffic junction and the framing vegetation. By the teaching team

1 Isabelle Fehlmann, "Geschichte einer Europabrücke," in Patrick Dübin, Isabelle Fehlmann, Christophe Girot, and Myriam Uzor, eds., *Exklusiv Europabrücke: Auf Umwegen durch Zürich-Altstetten* (Zurich: gta, 2020), 9–18.

settlements, open spaces, and transport areas should meet the upcoming challenges of spatial development and internal densification. The municipal master plan is thus an important basis for negotiations on the use of public space and shows the requirements for new infrastructures – such as bridges – in the city of Zurich.

By 2040, the number of new residents in Zurich is expected to rise by one hundred thousand people, increasing to just over half a million. In line with this projected growth, the expansion and usability of infrastructure for pedestrian use, connectivity, recreation, and relaxation is becoming increasingly important. This was already confirmed by the electorate of the city of Zurich in 2011, with the adoption of a corresponding initiative stating that the percentage share of public transport, as well as pedestrian and bicycle traffic in the total traffic volume, is to be increased by 10 percent.

This shift in mobility toward environmentally friendly forms of transport, together with enhancements of the city through heat-reducing measures as a contribution to an improved urban climate, are increasingly bringing public space back into the focus of the current local political debate. Riverside areas represent major open spaces within the city and therefore play a central role in transforming the public space. At the national level, the Swiss federal government is also calling for the densification of urban centers with the aim of improving quality of everyday life and public space.

Streets, squares, and infrastructure shape the urban space and the quality of life for people's everyday lives. This makes the quality of these spaces a key element for municipal development. This was also the conclusion of very broad research conducted by the Swiss National Research Programme "New Urban Quality" (NRP 65),[2] which found that spatial quality is characterized by increased accessibility, such as a coherent network of public spaces that are well connected to each other. Accessibility refers to the possibility of visiting a place at different times and remaining there. Moreover, public spaces are of high quality when adaptability and appropriation are possible. Adaptability is the ability for a situation to be adjusted as much as possible to changing requirements for different user groups and purposes. Appropriation refers

2 Simon Kretz and Lukas Küng, eds., *Urbane Qualitäten: Ein Handbuch am Beispiel der Metropolitanregion Zürich* (Zurich: Edition Hochparterre, 2016).

to the fact that different users and social milieus can actively claim a situation through their practices and relate it to their specific needs. Overdetermined public spaces should be avoided, and flexible, usable spaces should be increasingly made possible. How can we use the existing resources of urban spaces sparingly, intelligently manage different forms of mobility, and "de-regulate" norms so that new uses become possible again? The COVID-19 pandemic measures of the last two years also confirm the need for increased accessibility of public spaces. The city was radically decelerated, navigated on foot, and new places to spend time were discovered. The spatial qualities of the river spaces were also rediscovered in the process.

Bridging the River Sihl

The Sihl – one of the three rivers of the city of Zurich – is a river of contrasts. Even today, large parts of the bank are barely accessible or not at all. According to the historian and journalist Jean-Daniel Blanc, there were almost no passable roads along the Sihl until around 1850.[3] The wild and unpredictable Sihl was avoided. In the narrow river valley, no place was safe from flooding. In the flat areas of the city of Zurich, swamps or the changing course of the river prevented the construction of traffic routes and bridges. For centuries, the St. Jakob Bridge – called the Sihlbrücke – was the only bridge over the Sihl in today's urban area. It was not until the end of the nineteenth century that seven bridges were built in what is now the city of Zurich. Among them was the Stauffacherbrücke, which was built in 1899 by Robert Maillart, probably Switzerland's most famous bridge builder.

The construction of the railway had a formative influence on the disciplining of the Sihl. In the 1920s, the city and the Swiss Federal Railways (SBB) realized a large-scale urban development project and thus brought about a comprehensive urban reorganization by laying the railway underground along the lake's left bank. The railway line was laid in an open cut in Aussersihl, which had been crossed by numerous road bridges. The line was continued from Wiedikon to Enge in a tunnel under the Sihl. To this end, the course of the Sihl and the Sihlhölzli area had to be completely

3 Jean-Daniel Blanc, *Die wilde und die zahme Sihl* (Zurich: Hier und Jetzt, 2021).

redesigned. The Sihl waterfall still shows the underground tunnel construction today. The Seebahn, which was laid in a cut on city territory, crosses underneath the Sihl at this point.

The Sihl became a disciplined urban river in one of the largest urban redevelopment projects of the twentieth century. From the 1920s, the focus of urban planning shifted toward the automobile: toward a car-friendly city. Around 1955, the city council had its *Generalverkehrspläne* drawn up by external experts. But the city quickly lost control of its traffic planning as national highway planning was prioritized. It was intended for the motorways to meet at the Platzspitz above the Limmat in a traffic circle, from where they were to connect to a subterranean northern axis (Ypsilon). The Sihl was to be covered by an urban motorway from Allmend to Platzspitz. Around 1960, these plans were finalized. However, a group of young architects in the Zurich working group for urban development warned the city council against the project, using primarily economic arguments, so that the plans were reviewed. They envisaged high-rise buildings along the Sihl. This opposition succeeded in resisting the express roads. However, it was no longer possible to prevent the construction of the Sihlhochstrasse in the stretch of the river between the Allmend and the Giesshübel. Today, the 1970s construction looks like a relic from a bygone era. Eventually, transport policy demanded the expansion of public transport. As a result, in 1990, for example, the Sihltalbahn was laid under the Sihl. The expansion of the Europaallee as well as planned river developments and bridges are today's most current projects.

The many changes to the course of the Sihl – as listed above – illustrate what the Swiss writer Hugo Loetscher criticized in a daily newspaper in 1981 as arrogance:

Zurich has never wanted to admit that it is a city that is situated by a lake and two rivers. It has always been clear that it is situated by the Limmat. But it has always regarded the second river, the Sihl, as the inferior one, and it has let it feel this with all its arrogance.[4]

4 Hugo Loetscher, "Die Sihl, der mindere Fluss," *Neue Zürcher Zeitung*, August 29, 1981, http://nzz-files-prod.s3-website-eu-west-1.amazonaws.com/files/3/6/3/Sihl_Loetscher_web_1.3373363.pdf (accessed June 5, 2022).

Fig.5 River Sihl, Zurich 2019.
Three-dimensionally collaged bridge and footpath connecting the different levels of the Sihlbrücke, Selnau railway station, and riverbank.
By Maria Kriman, Zhaoye Li, Qianer Zhu

At the same time, the history of the River Sihl – in contrast to the Limmat – shows a landscape of half finished visions and large-scale urban development projects.

Eight Student Visions

The student works of the elective course in topology by the Chair of Christophe Girot deal with this river space of the Sihl: the existing and absent bridges. After documenting and analyzing the topographic potential of the real river space in a 3D point cloud model, they placed existing bridges over the Sihl. By implementing existing constructions of the city as new infrastructures their visions create new pedestrian relationships: a new image of reality, a model. What can we learn for future urban development from these visions and methods? What can these visions contribute to the current challenges and negotiations on public space?

In the following, the students' visions are discussed on the basis of the criteria for creating urban quality listed above: creating accessibility, enabling adaptability and promoting appropriation.

Placing Wooden Decks

Several student projects place footbridges in the riverbed of the Sihl river, connecting only in part the two riverbanks. The project at Selnau station, for example, adopts the existing wooden footbridge of the Schanzengraben to establish a connection along the right bank of the Sihl, thus fulfilling a requirement of the master plan – creating a continuous path along the right bank of the Sihl to the central railway station. Staircases provide access from the Sihl bridge and the Haus Konstruktiv. The other projects also place footbridges in the riverbed, at the level of the water surface.

In terms of creating accessibility, an important aspect is contextuality. The new footbridges create new places to linger at the same level as the Sihl; the water can be experienced. One of the projects even makes it possible to experience and sense the small waterfall of the Sihl. However, access is limited to pedestrians. As for enabling adaptability, the structure of the footbridges creates a flexibly usable area. In regards

to encouraging appropriation, in a central location, lighting and visibility are essential. Possibly, seating options such as those available in the Schanzengraben could also add value. However, wooden walkways offer everyone the flexibility to lie or sit on them, alone or in groups.

The new recreational areas of all these projects offer added value in terms of recreation and quality of stay. The new footbridges are an interesting proposal and a convincing vision for making the river space and the water of the Sihl accessible and more tangible. The question arises here whether the vision should not be a continuous, extended path that connects the Sihl bridge with another bridge or even with Zurich's main station, as is also called for in the municipal master plan.

Building Bridges

The project between Stauffacherbrücke and Sihlbrücke places an iron bridge, familiar from railway construction, across the river at the EWZ building. The structure creates a new connection between two traffic-dominated sides of the Sihl. One of the projects uses an existing structure, the elevator of the Hürlimann Areal, to cross the Sihl from an elevated level. Another project aims at connecting Klopstockwiese with Giesshübel by means of a wooden construction. The bridge passes beneath the motorway, uses the park's elevated position and topography, and connects the various levels with the aim of joining the park with the Sihl promenade. The new bridges provide accessibility, connect neighborhoods, link the surrounding open spaces with the Sihl area, and create new paths in the broader sense of the guide-line planning. The iron struts of the bridge at Pfingstweidstrasse seem somewhat oversized and channel the bridge space. The adaptability of the space is certainly possible in the project with the iron bridge since it is covered. However, this project raises the question of conflicts of use with different speeds of movement at such a central location. As a new networking structure between Sihlporte and Werdstrasse, the idea is very interesting. The connection between the Sihlhölzli and the Hürlimann Areal also creates new connections and networking structures between the neighborhoods that could be promising. Appropriation is conceivable for temporary uses such as flea markets. However, a wider bridge would offer more possibilities.

Repurposing the Highway Overpass

The project that proposes to repurpose the existing motorway infrastructure is probably the most radical. In terms of accessibility, new places will be created. The potential for adaptability is significant, as the areas could be used for events. The motorway becomes a stage above the Sihl. In this sense, a conversion of these areas would be an interesting adaptation of existing transport infrastructure.

Conclusion

The point cloud models create new images and guiding principles, while partially hiding what exists. They create a new aesthetic and vision for the Sihl area: wooden footbridges are re-laid, bridges are built, and highways are repurposed. Through the strong three-dimensionality of the images, they connect different spatial levels – those of the water, the bridges, the surroundings, the adjacent high-rise buildings – into a coherently legible urban landscape. What is expressed in the city's traditional planning process through sections and situation plans thus becomes coherently legible in the 3D model. The decontextualization of the bridges creates visions, virtual spaces in which the history of other urban contexts overlaps in the Sihl space.

As part of our work with the city of Zurich, we are constantly developing concepts and plans as guiding principles for future developments. The focus is on questioning the functions and uses of existing infrastructure such as roads, bridges, and subways to meet the current and future demands of an increasingly dense city. Conflicts of use and conflicting demands for use are a challenge. Accessibility, adaptability, and appropriation offer criteria for reflecting on and questioning aspects of use. The students' visions for the Sihl space use new processing and visualization tools to better depict interrelationships that could certainly be used as models for new infrastructure in the city.

Fig.6 River Sihl, Zurich 2019.
Proposal for a bridge connecting both riverbanks and the rail station below the riverbed.
By Guilherme Lacks, Elias Knecht, Julia Rosas

Different levels of the city become visible in the image and thus can be read in a topographically coherent way. I consider this to be a very valuable form of representation, especially for bridge structures.

The eight projects show potential. However, not a single human being is depicted in them. The pictures thus hide questions of use. Conflicts between different demands for use are also not visible. Are they places or passageways? Where are the dirt and the garbage? And what is the scale, width, and height of the construction? Are there concrete possibilities for appropriation? The different participants and their own speeds of movement are a challenge in bridge construction but are not expressed in the projects. As a result, the negotiations about the use of public space are not legible in the project ideas.

Modern means of transport tend to make the journey abstract and insignificant. Bridges connect the landscape and make it "travelable" as a network. Thus, bridges are part of a "placeless system of infrastructure."[5] As a building object, however, bridges are part of a specific context and contribute to redefining, creating, and reinterpreting places. The existing bridges over the Sihl are an expression of this abstraction of movement.

One critic of this development, sociologist Lucius Burckhardt, introduced a critique of function-oriented perception into teaching, politics, and research with the *Spaziergangswissenschaft* (science of walking) in the 1970s.[6] Due to the effort to increase safety in urban space, we have learned to constantly optimize the use of limited urban space with different functional requirements. Burckhardt calls for a new assessment of familiar situations to be able to recognize and question possible new readings. He was interested in the walk not as a representation, norm, or measurable quantity, but as an instrument for perceiving urban space. The science of walking is therefore both an instrument for making visible hitherto hidden elements of the environment and over-regulation and a means of criticizing conventional perception. Another of Burckhardt's central themes, in addition to landscape perception, was the critique of infrastructure's order of use.

5 Mari Hvattum, "Bridging the Gap," *docomomo Journal* 45 (Winter 2011).

6 Lucius Burckhardt, *Warum ist Landschaft schön? Die Spaziergangswissenschaft* (Berlin: Schmitz, 2006).

For example, he questioned why cars could use parking spaces, but we cannot, for example, put cabinets, tables, and chairs on them. In this sense, the students' visions are contributions to a new perception of the Sihl space. The functions of the bridges (and the existing order in general) could be questioned more. Why can't motorways, for example, become theater stages? Why can't bridges and footbridges become sunbathing areas and meeting places in the city, perhaps even temporarily during the hot holiday weeks? In the spirit of Lucius Burckhardt, we should increasingly perceive infrastructure in a new way to recognize the potential for conversion.

The Sihl area, which has been transformed from a wild river into a disciplined construction by hydraulic engineers, and on which the development and conversion steps of urban development can be read, is well suited as a complex infrastructure landscape and investigation space for testing and demonstrating visions and methods for the future. The student projects from the elective course in topology are thus a valuable contribution to rethinking bridges and open spaces.