

Policy summary

Urban open space has a huge impact on human health, well-being and urban ecosystems. One type of open space where the environmental and ecological challenges of cities manifest the most is the urban riverfront, often characterised by fragmented land use, lack of accessibility, heavy riverside vehicular traffic, and extreme degradation of river hydrology and ecology. More often than not, the current spatial design of the riverfront hinders rather than supports the provision of ecosystem services and, in consequence, its potential to improve the health and well-being of urban inhabitants is diminished. Hence, the urban and landscape design of riverside open spaces is crucial.

The I-SURF (Instruments for Sustainable Urban Riverfronts) project took up this challenge by developing a set of design instruments that can aid designers, planners, decision-makers and other stakeholders in devising spatial interventions that integrate complex environmental and ecological goals in high quality and sustainable riverfront public space design. The four I-SURF instruments, namely the Connector, the Sponge, the Integrator and the Scaler, focusing on connectivity, spatial capacity, integration and multi-scalarity, respectively (Figure 1), provide a grounded and systematic approach to the analysis and transformation of riverside urban spaces. Moreover, the visual communication of the instrument set is meant to facilitate collaboration between stakeholders involved in riverfront transformations.

As a result of the design-driven research process of the I-SURF project, consisting of an international design workshop in Amsterdam and an expert survey, the project concluded with an updated instrument set that is more user-friendly, accessible and reliable in producing social-ecologically integrated spatial design solutions. The practical challenges encountered in the implementation of the instruments have led, on the one hand, to better design solutions and, on the other hand, to a better understanding of misalignments between current densification-driven development targets and environmental targets promoting open space quantity and quality. Instruments such as the ones developed in the I-SURF project can mitigate such misalignments by facilitating the negotiation between density- and open-space-driven development targets. Policy- and decision-makers concerned with urban spatial development and urban water management can make use of the I-SURF instrument set to guide, gauge or implement sustainable riverfront transformations and to better engage stakeholders in the process.

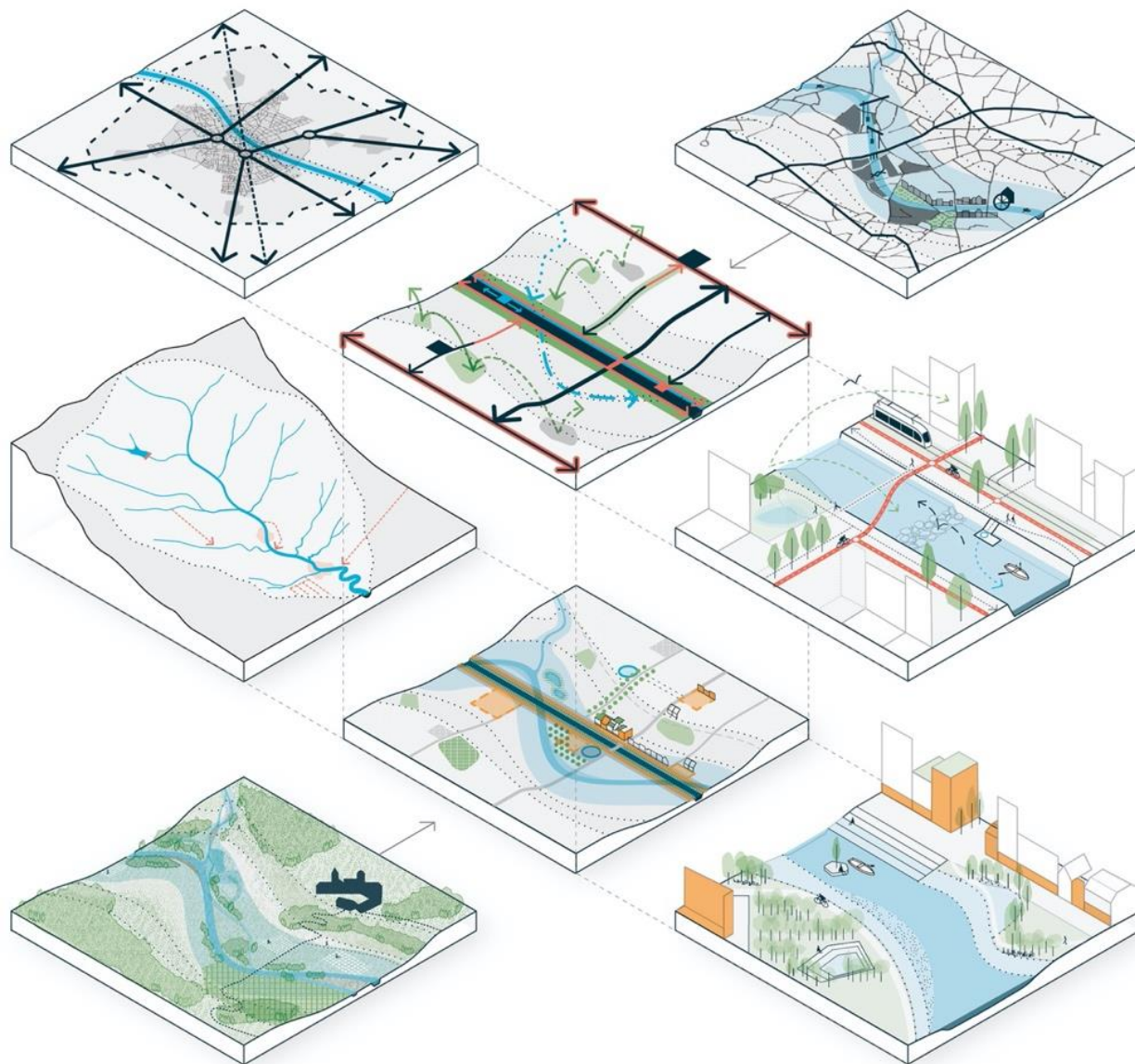


Figure 1 Overall diagram of the four design instruments (see legend in the bottom right). Source: Forgaci, 2018.

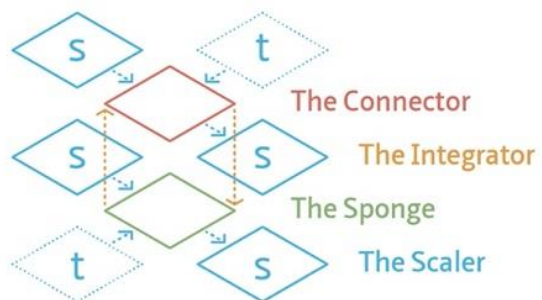




Figure 2 The three riverside urban areas used in the design workshop.

Approach

By recognising the multiple environmental and ecological benefits of green space and water in the city, the I-SURF project applied a set of four spatial design instruments, namely the Connector, the Sponge, the Integrator, and the Scaler (Figure 1), [developed previously at TU Delft \(Forgaci, 2018\)](#). In a three-phased research process (Figure 3), I-SURF tested, evaluated and updated these instruments through a design-driven research methodology involving a design workshop and an expert survey addressing three different riverside urban spaces in Amsterdam: **Hamerkwartier** in the IJ waterfront, **Kop Amstelscheg** along the River Amstel, and **De Oeverlanden** next to Nieuwe Meer (Figure 2).



Figure 3 The three phases of the I-SURF project

The **testing phase** consisted of [an intensive international design workshop that took place at AMS Institute between 6-10 May 2019](#). The workshop brought together students, young professionals, young researchers and experts from different disciplines, as well as stakeholders including representatives of the City of Amsterdam, to develop spatial design solutions to problems found in the three riverside urban areas in Amsterdam. The design instruments were introduced to the participants to develop social-ecologically integrated spatial interventions. With 36 participants, guided by experienced designers from TU Delft and practice, and with input from several experts from Amsterdam and relevant domains, the workshop resulted in 12 riverfront transformation projects (4 for each site) appraised by a jury of experts and exhibited at AMS Institute during the We Make The City 2019 event in Amsterdam.

In order to be used as input data in the **evaluation phase**, the projects produced in the workshop were anonymized and redrawn in a standardized format. In the evaluation phase, experts familiar with the three sites in Amsterdam evaluated the standardized design projects developed in the workshop through an online questionnaire. The purpose of the evaluation was to draw conclusions about the usefulness of the instruments in designing for social-ecological integration in riverfront transformation projects. Results show that the use of the instruments by the workshop participants has led to an increase in the quality of projected sustainable transformations as compared to proposals that did not use the instruments. Moreover, feedback collected from the workshop participants and the experts involved in the evaluation was used to refine the instructions and user friendliness of the instruments proposed.

The project concluded with **an updated and transferrable instrument set** useful for urban and landscape design applications in Amsterdam and beyond. The updates, based on input received from the design workshop participants (Phase 1) and from experts (Phase 2), consist mostly of (i) an **improved procedure** of how (e.g., in what order) can the instruments be better applied in the design process of riverside urban areas and (ii) **improved instructions** of how one can use the instruments more easily. These updates have made the instruments more user-friendly and accessible to a variety of use cases.

All in all, the I-SURF project brought together a wide range of experts from practice and academia, inhabitants from the case study areas, as well as a large group of international students, researchers and young practitioners from different disciplines. The workshop gained considerable visibility and raised awareness of the importance of sustainable riverfront transformations. The community created around the project is still active and the knowledge gained in the workshop is used. More details can be found on the workshop webpage: <https://www.ams-institute.org/events/sustainable-urban-riverfronts-design-workshop/>

Insights

The I-SURF instruments are meant to facilitate the **transfer of knowledge between research and practice** targeting sustainable urban riverfront transformation. To that end, the main goal of the I-SURF project was to test the usefulness and ease of use of the design instruments and to evaluate how they perform in translating academic knowledge on sustainable riverfront transformations into practice.

Insights for users

The I-SURF project addresses the following three groups of users:

- **Decision-makers** can use the I-SURF instruments to easily test alternative design solutions that do not only address socio-economic targets of built development, but also integrate environmental-ecological targets necessary for sustainable public space development.
- Through evidence gathered from projects that use the instruments in co-creation processes, **policymakers** can gain insight about development trajectories required for sustainable riverfront transformations.
- The design instruments developed in this research have a direct impact on **the practice of urban and landscape design** dealing with riverside urban transformations. By using these instruments, practitioners will easily incorporate academic knowledge about sustainable and social-ecologically integrated design principles in their projects.

Insights for policy

The following principles, essential for policies targeting urban riverfront development, are implemented by the I-SURF design instruments:

- The degradation of urban river hydrology and ecology can be reversed by renaturalising riverbanks, by providing green transversal corridors along and leading to the riverfront and by restoring green patches in surrounding urban areas. Together, these three measures improve the three-dimensional connectivity needed for a better hydraulic and ecological performance of riverside urban areas.
- Urban rivers need to be publicly accessible, both with transversal access routes and continuous routes along embankments, and need to be easily crossable, visible and physically approachable. Heavy riverside vehicular traffic in the riverfront should be discouraged. Only this way the public space and amenity potential of urban riverfronts can be achieved.
- Urban riverfronts need to be designed and planned in an integrated way, with special focus on supporting spatial synergies and mitigating conflicts between urban development targets and ecological targets. A good balance between built density and open space is essential. Mixed, hybrid and complementary land uses can overcome the issue of fragmentation.
- Urban riverfronts need to be understood as part of a wider system, that of the wider water management system, of the network of all public spaces in a city, of the larger green infrastructure network. At the same time, urban riverfront transformations require a good understanding of detailed solutions, including technical water management measures, local social practices, and variations of microclimate conditions. As such, sustainable urban riverfronts require multi-scalar approaches.

Information I-SURF project

Duration: 2019-2020

Project team:

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