

SHAPING AN URBAN RIVERSCAPE THE PLANNING AND DESIGN OF DANUBE ISLAND AND THE NEW DANUBE IN VIENNA, 1969–1988

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Within the last 150 years, two major flood-protection projects have fundamentally changed the Danube riverscape in Vienna. The first project, in the 1870s, involved straightening the river in one main bed with a large parallel inundation area. Between 1969 and 1989, the inundation area was transformed into a 21 kilometre long island and a parallel flood-relief channel. The paper investigates the development of the project, the shift in planning strategies, and its effect on the design of the island and river banks. The research is based on a literature review and analyses of urban planning concepts, design concepts, site construction plans, and planting schemes.

An interactive planning process, the Vienna Model, was developed to coordinate the large number of actors and manage their controversial planning strategies and goals. Owing to the long ongoing planning and realization process, the requirements and objectives of this large urban riverscape project have changed over time. Besides the need for flood protection, concerns about urban recreation, ecology, and landscape protection have gained in importance. Within the Vienna Model's organizational structure, the flood-protection project with all its technical requirements evolved into a multifunctional riverscape. Today, Danube Island and the New Danube are crucial elements in Vienna's urban fabric. This artificial landscape is extremely popular for urban recreation and activities; it contains vital semi-natural sections and has coped with five major floods since 1991.

A close look at the complex planning process and the successful landscape design of the Vienna Danube region provides crucial indicators for large urban river projects. Urban riverscape projects need to be innovative and require a multidisciplinary team to tackle the diverse challenges. They need a strong design framework to cope with and respond to changes in demand, use, and management. And, above all, they need to serve multiple functions, including flood protection, recreation, ecology, and nature conservation.

Keywords: Danube, flood protection, landscape design, recreation, Vienna

1 Introduction

Today, the artificial Danube Island and the New Danube are crucial elements in Vienna's green and blue network (Stadtentwicklung Wien, 2015). They are the result of two major flood-protection projects that have had a fundamental impact on the Danube riverscape in Vienna. From 1870 to 1875, the branching river was straightened into one main riverbed with a large parallel inundation area of 8.25 square kilometres of almost flat ground. Overflows of the swiftly moving Alpine river were then limited, but flooding remained a risk. In view of this, 100 years later, the inundation area was transformed into a 160 metre wide flood-relief channel and an artificial island parallel to the main stream. The island is 21.1 kilometres long and

200 metres wide on average. A mere technical project in 1969, the island and the flood-relief channel were later transformed into a multipurpose riverscape in the course of an interactive planning process that lasted almost twenty years.

Taking the artificial Danube Island and the New Danube as a case study, the paper focuses on the interrelationship of the site, the planning process, and landscape architecture. With this in mind, the objectives of this paper are:

- to review the history of the island and the interaction of the actors involved;
- to analyse the shift in planning strategies and the consequences this has had on form, function, and meaning at the site scale;



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- to analyse the spatial and design qualities of the island; and
- to discuss how the findings can inform the design of an urban riverscape.

Background and Literature Review

The planning and design of open spaces, in general – and green and blue infrastructure, in particular – are based on specific concepts and ideas that are influenced by distinct planning traditions, values, and scientific approaches. All of these reflect specific relations of power and change over time (Jongman, Külvik and Kristiansen, 2004). The extremely long planning and realization period of Danube Island and the New Danube clearly shows these interrelations.

From the urban planning perspective, Danube Island serves as a “green corridor”. In the urban development plan 2015, called STEP 2025, “green corridors” and their smaller counterparts “greenways” are important types of linear open spaces in a network model, aiming at a better connection of major green spaces and enhancing the living conditions in densely built-up urban areas. Green corridors have a particular significance for all four network functions of green and open space, which are “everyday life and recreation”, “structuring the urban fabric”, “ecosystem services”, and “nature conservation” (Stadtentwicklung Wien, 2015). The ecological relevance of linear green structures has been intensively researched (e.g. Jombach et al., 2016), but little has been published on the design aspects. Walmsley (1995) discusses the impact greenways have on urban form, but does not address design on the site scale.

Danube Island and the New Danube form an artificial landscape, they are planned and constructed – they are designed. Four square kilometres of land and a 3.3 square kilometre expanse of water have become an integral part of the fabric of the city, providing diverse outdoor spaces. Seeing Danube Island as a “large park” gives us new ways of looking at a complex open space in the city. James Corner stresses the fact that large parks “are larger than the designer’s will for authorship, they exceed over-regulation and contrivance, and they always evolve into more multifarious (and unpredictable) formations than anyone could have envisaged at the outset” (Corner, 2007). The challenge to design such a complex and dynamic system is – according to Corner (2007) – the equation of fixed form, open process, and meaning. Corner stresses the importance of designing a framework that is robust enough to provide structure, but retains the flexibility “to adapt to changing demands and ecologies over time”. He describes a framework as a “highly specified

physical base from which more open-ended processes and formations take root” (Corner, 2007). We can safely assume that Corner sees the physical elements of a design, like topography, planting, or infrastructure, as contributing to the “physical base”.

However, we consider it equally important that a framework should guide planning and decision-making processes, while also addressing the question of how different actors can be integrated. Julia Czerniak engages with these planning, social, and political aspects, pointing out that “in addition to size, the term ‘large’ implies ambition”, “‘large’ invokes thinking beyond the given”, and “large also implies a considerable amount of energy, vision, commitment, and innovation – by designers, administrators, politicians, and the public they serve – to make these parks happen” (Czerniak, 2007).

The landscape architect Martin Prominski stresses the importance of interlinking the issues of flood protection, ecology, and the accessibility and use of open space (Prominski et al., 2012). This understanding has gained importance in recent years in urban river design, owing in no small part to the fact that rivers have been elevated into prestigious areas for social urbanites to gather in (Prominski et al., 2012; Way, 2018).

The development of Vienna’s Danube flood-protection project from 1969 to 1989 is a complex case that allows us to study the interrelationship of planning and design in an urban riverscape in the second half of the twentieth century.

2 Material and methods

The findings of this paper are based on a review of publications on Danube Island, thus following an inductive approach to research. The literature review covers the history of the area, the island, the planning process, and the actors involved. Urban planning concepts and development plans are analysed to determine the role of the river and of the artificial island in planning strategies for open-space development, protection, and design. The interrelationship between site and design is elaborated by analysing regulation schemes, site construction plans, and planting schemes.

3 Results and discussion

3.1 Planning process and switch in planning strategies

Danube Island in its existing form is the result of a planning process that spanned twenty years. Internal and external factors have influenced this

process and shifted the project’s focus, transforming it from a purely technical structure into a multifunctional riverscape.

The basis was laid with the first flood-protection project in the 1870s, when the branching Danube was straightened into one main riverbed with a large parallel 450 metre wide inundation area (Figure 1). Rapid urban expansion started on the right bank of the new riverbed, while the inundation area on the left bank soon developed into an informal recreation area. The character of this area was defined by meadows, scattered clumps of trees, and floodplain relicts. Users were attracted by its size, its wild character, and the absence of strict regulations, which offered multiple recreational uses and a feeling of freedom in a time of urban densification.

A major flood in 1954 made flood protection an imperative once again. This gave rise to a technically oriented project involving a straight flood-relief channel and an island of trapezoidal cross

section. Experts were critical of the fact that this project did not provide for any recreational needs or ecological functions. One of the critics, architect Ernst W. Heiss (1964), who was responsible for landscape planning at the municipal department of urban planning, stated that the river required a new open design that would be sensitive to “the great spirit of the river” and allow for diverse recreational use, just as the inundation area had done so far. According to Heiss (1980), the Danube area should become the core and spine of a generous green structure in Vienna, while Danube Island should upgrade the floodplain relicts. However, these early critics made only minimal changes to the technical flood-protection project. A municipal landscape design dating from 1968 shows institutionalized recreational facilities such as swimming pools, a variety of ball courts, golf, and camping on the island. The fundamental attributes of the technical project – like the straight

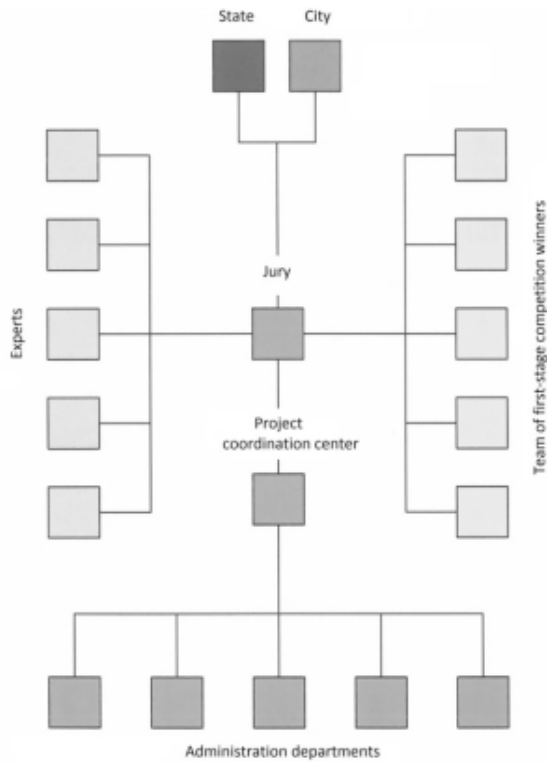
banks and the trapezoidal cross section – were retained. The design did not provide any access to the water. Besides, the development of new residential areas on the island was still being considered up until 1976.

The first construction work on the technical project began in 1972. But it was only in the wake of the global rise of postmodern environmentalism in the early 1970s and, at the local level, serious public concern over the continuous destruction of the urban wetland relicts that the planning process was politicized (Redl and Wösendorfer, 1980). Expert advisers strongly recommended the initiation of a landscape design process (Gruen, 1972) and stressed the crucial importance of the Danube and its adjacent landscapes as a greenway linking and developing the urban fabric (Woess and Loidl, 1974). As a consequence, the city launched a two-stage design competition in 1973–1975, parallel to the ongoing construction work.

In response to the competing solutions and visions, an interactive planning process, the “Vienna Model”, was developed. This model brought together different actors and decision-makers in planning, urban, and landscape design as well as in water engineering. It systematized the cooperation of external experts, representatives of administrative departments, the state and the city, and the five winning teams from the first stage of the competition (Figure 2). Landscape architect Bruno Domany from the municipal department coordinated the long ongoing discussions and the planning process. In the end, the different planning approaches gradually merged into one project, which stressed the infrastructural, ecological, and societal functions



■ **Figure 1:** Danube network in Vienna in 1960: the cut-off Old Danube (left), inundation area and the Danube River (right)
Source: WStLA FL3138



■ **Figure 2:** “Vienna Model”, model of project organization for the second stage of the design competition, which brought experts, representatives of the administration, and the winning teams of the first stage into collaboration
 Source: Seiß, 2001

of the river within the urban network. The overall concept referred to the former character of the site, the floodplain forest. The newly constructed land should complement and refine the remains of this habitat. However, the planners recognized that “it is not possible to construct a fully fledged new landscape at the first attempt... but only a supporting physical structure” (Domany, Schwetz and Seidel, 1982) or “a shell construction of a landscape” (Heiss, 1980).

The final landscape design by Gottfried & Anton Hansjakob and Wilfried Kirchner, which dates from the early 1980s, acknowledges the site’s tremendous potential for recreational activities and upgrades the landscape qualities of the former inundation area. Their design shapes the island’s topography and bank line and – for the first time – offers access to the New Danube as a place to swim.

3.2 Spatial structure and design principles

The design categorizes the 21 kilometre long island and its riverbanks into three sections of diversified character and potential. The middle section of the island, which is close to residential neighbourhoods on both sides of the Danube and connected to public transport, is designed like an urban park and accentuated with architectural elements like retaining walls, terraces, and stair seating. In contrast,



■ **Figure 3:** First draft of the northern section of Danube Island and the New Danube, Gottfried and Anton Hansjakob, 1976
 Source: Archiv Österreichischer Landschaftsarchitektur LArchiv, BOKU Vienna, Collection Hansjakob, VL-HAN-20

the northern and southern sections of the island are designed to support processes of natural succession. Here, the design interventions set out to be modest and respectful in order to preserve as much of the informal character of the former inundation area as possible (Domany et al., 1982). All over the island, meadows and woodland alternate and form enclosed areas as well as zones that open up to the Danube and the New Danube. Vistas and access to the water were a key requirement (Figure 3).

The landscape architects developed a comprehensive typology of banks, which should guarantee an attractive design of the roughly 60 kilometre long riverbanks of the New Danube and the left bank of the Danube (Figs 4a–b). This typology was required to meet flood-protection regulations and ecological needs and to offer different structures for recreational use. Steep, architecturally designed sections alternate with shallow, semi-natural banks; the line of the bank was modelled to create a slight meander, the riverbed broadened out into coves, and small islands were constructed offshore. Specific parts of the island were lowered to allow for occasional flooding and for succession in the riparian vegetation.

3.3 Planting

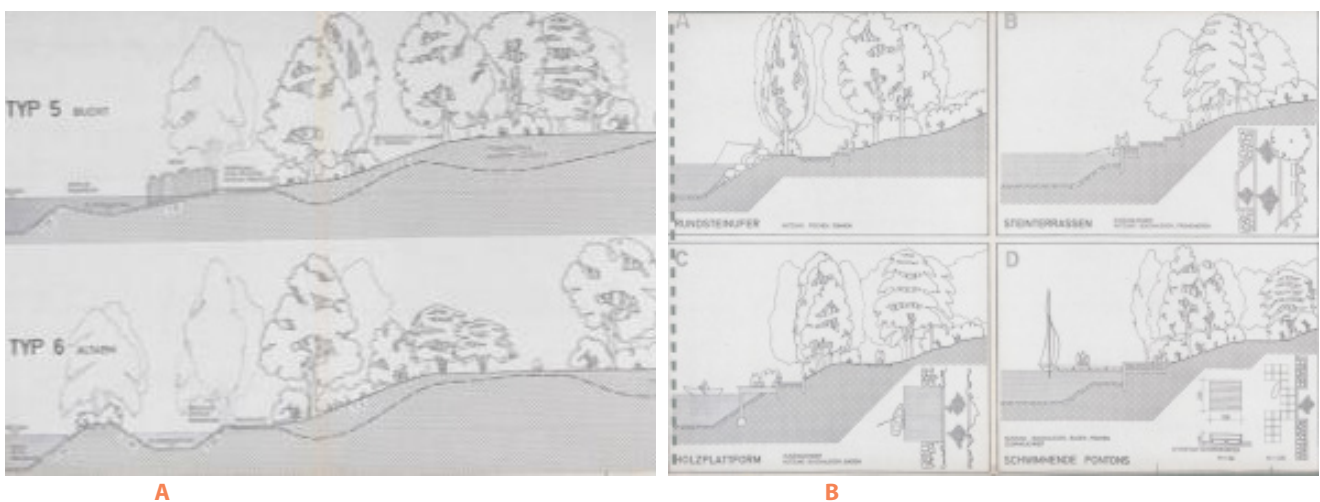
The overall planting scheme varies between the semi-natural areas in the northern and southern sections of the island and the urban, park-like character of the middle of the island. At both ends of the island, the density of the planting amounts to 50 to 70 per cent ground coverage; extensively used woodland alternates with spacious meadows. In contrast, the middle is less densely planted; here avenues, single

trees, and groups of trees and shrubs predominate. All over the island, the plantings offer open vistas, making it possible to perceive and enjoy the entire extent of the river landscape (Figure 5). During the last five decades, many vistas have become overgrown and need extensive treatment to restore the essential spatial and planting concept.

The landscape architects geared their planting scheme to the vegetal remnants of the Danube floodplain. As the island's stony structure is permeable to water, a specific soil-management plan indicated trenches and berms, where fine-grained material was deposited to create moist and water-retaining habitats. The planting design, which is informed by the ecological understanding of the early 1980s, ranges from reed belt and willow fringe communities on the stony banks, through riparian hornbeam and scrub woodland, to riparian lime woodland above the projected flood line (Hansjakob and Hansjakob, 1980; Knapp, 1984). These extensively designed areas provide new aquatic habitats, where flora and fauna typical of river wetlands have gradually evolved. Nowadays, these semi-natural sections of the island are landscape-protected areas.

3.4 Functional concept and recreational facilities

The functional concept is based on the spatial idea of differentiating the island into an intensely designed middle section resembling an urban park, and extensively designed peripheral sections. The middle section should thus provide an environment of urban recreation. As the operating companies, with their business structures and concepts, were not known during the planning process, the landscape architects created a spatial framework for a recreational landscape,



■ **Figure 4:** Bank typology – steep sections with stone banking, terraces, wooden decks and swimming pontoons (A), and shallow semi-natural banks (B), 1975
Source: WSTLA, Kleine Bestände-Besondere Projekte A44-2 Städtebaulicher Wettbewerb Donauraum 1–54



■ **Figure 5:** View from a bridge across Danube Island to Leopoldsdberg – the New Danube is in the foreground, while the Danube River is behind the island and not visible
 Source: Grimm-Pretner, 2007

which facilitates a large variety of recreational uses and clearly indicates the focal points for different activities (Domany et al., 1982). In the middle section, two main paths are situated above the high-water mark and form a kind of boulevard with small squares and terraces. These wide, paved paths are connected to towpaths running along the bank line. Today, the middle section of the island and of the New Danube is equipped with playgrounds, sports fields, barbecue equipment, and swimming pontoons. All these facilities are publicly accessible at no charge. Restaurants, small takeaways, and toilets enable visitors to spend a whole day on Danube Island.

The extensively designed sections at the northern and southern end of the island serve as ecological habitats. However, people are invited to use these areas; one main path above the high-water mark and additional towpaths run the length of the island and offer contrasting experiences of active recreation – such as running, walking, cycling, swimming, and boating – and wildlife observation. The functional concept recommended flexible facilities for these remote parts of the island and suggested “central sites for recreational use” with takeaways, toilets, and boat or cycle rentals.

Over the last decades, Danube Island has turned into a riverscape of major recreational and ecological importance for the city. Today, three underground lines

link the island and the New Danube with the city centre and zones of new urban densification on both sides of the river.

4 Conclusion

■ Urban riverscape projects need to be innovative

The invention of the “Vienna Model” was an innovative approach for team work and for decision making. During the long process of planning and realizing a large urban riverscape project, requirements and objectives change, with a variety of forces and actors influencing the project’s development over time. A staged approach makes it possible to adapt to changing needs.

■ Urban riverscape projects need a multidisciplinary team

Engineers, ecologists, landscape architects, urban planners, and architects need to be ambitious and ready to tackle challenges beyond their immediate professional sphere. A part of this is the need to find a common language.

■ Urban riverscape projects need a design framework

The construction of the island, its banks, infrastructure, and structural plantings determine the form and

characteristics of the artificial landscape. This framework should be strong enough to cope with and adapt to changes in demand, use, and management. Thus, later modifications will not change the overall character of the landscape.

■ **Urban riverscape projects need to be multifunctional**

Danube Island and its adjacent channel meet the major goals of urban riverscape design – flood protection, ecology, and the accessibility and use of open space. Five heavy floods between 1991 and 2013 have shown that the New Danube can serve its purpose as a crucial flood-detention basin. The intensive use of the open space by a wide range of local residents confirms its relevance for recreational purposes. Multifunctionality can only be achieved in a riverscape by connecting the technical flood-protection project with a landscape architectural project.

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