The Hague Central Innovation District – Social-technical city,
Technological transitions facilitate encounter and social connections
(Team Socio-Technical City, *The Biopolus: water treatment and food production)*

City of the Future

Ten design strategies for one square kilometre in five cities

Amsterdam, Den Haag, Eindhoven, Utrecht, and Rotterdam (The Netherlands)

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LOCATIONS Amsterdam Haven – Stad, Den Haag – Central Innovation District, Eindhoven – Fellenoord, Utrecht – Stadsrand Oost, Rotterdam – Alexanderknoop

KEYWORDS Transitions, Transformation, Future-proof urban environment, Spatial planning and design, Implementation strategies, Research by Design, Learning community

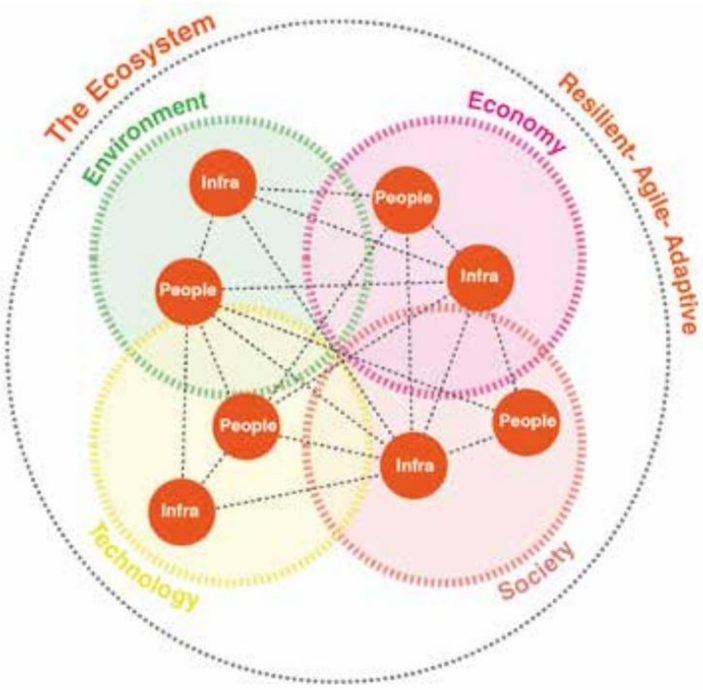
INTRODUCTION

Balancing urban transitions

In many Dutch cities, multitudes of transitions are competing for the scarce space. How are we to deal with these transitions? How do we prioritise them – or could we integrate several claims in a clever manner without compromising their requirements and even create synergy? This design study should give the Dutch government a deeper understanding of the spatial and system impact of the transitions. These questions and insights are relevant to the development en implementation of a new 'Environmental Law', an integrated approach to which was laid down in the national spatial planning vision (NOVI 2020). The law embodies a new framework of policies, regulations, and instruments for spatial planning in the Netherlands.

To gain sufficient insight into the various claims for space and their impact on the urban systems, the design study focused on a fixed area of 1 by 1 square kilometre in five cities. The participating cities proposed existing areas such as a port, business district, large-scale shopping mall, and a peripheral city area. How do we prepare these areas for the future, meeting current demands for housing, business, accessibility, and liveability? How do we deal with issues concerning mobility, energy, climate adaptation, circularity, social inclusion, and biodiversity?

(Team Socio-Technical City)



MULTITUDE AND INTERDEPENDENCY OF THEMATIC CHALLENGES

FIGURE 1

The Hague Central Innovation District – Urban densification above the railway track (Team Socio-Technical city)

Interdisciplinary approaches

Two interdisciplinary teams were assigned to each of the five locations: Amsterdam, Eindhoven, The Hague, Utrecht, and Rotterdam. The teams, made up of architects, urban planners, various engineering disciplines, and even artists and sociologists, were assigned to the individual challenges based on their motivation and initial approach. In addition to the design teams, another TU Delft team explored the future city from the subsurface perspective, resulting in the Subsurface Equilibrium project. Students from various design studios and elective courses from the Faculty of Architecture and the Built Environment, and from design courses from the Faculty of Civil Engineering and Geosciences joined in as well. Several masterclasses were organised in which practising scientists and experts addressed particular themes and topics concerning the future challenges facing cities, system innovations, stakeholder approaches, and business cases. Local studios provided interaction and discussion between the design teams and local experts. Plenary sessions offered an overview of the progress and final results of the design teams, plus a stage for debate and reflection with policymakers and experts about the completed studies.

THE TEXT IS BASED ON THE FOLLOWING PUBLICATION: Berkers, M. et.al (2019). The city of the future. Ten design strategies for five locations. Visualizations for a square kilometre of city. Amsterdam: BNA Onderzoek

attractive and future-proof urban environments

PROJECT RESULTS

Integrated urban transformations

The study yielded a broad palette of creative visions and spatial designs, as each location was assigned two teams to tackle the challenge. This approach enabled them to find common ground and come up with different proposals. The designs were rooted in technological, social, environmental, or hybrid design approaches and expressions. The central question driving the design study was: 'What are the possibilities for an integrated transformation of the study locations into attractive and future-proof urban environments?' This open-ended question allowed the teams to adopt an approach that suited the local issues and conditions. To ensure that the proposals would meet the study's desired quality, the organizers created a steering framework with a set of criteria, which included quality of life, spatial quality, sustainability, accessibility, system integration, resilience, adaptability, scalability, and feasibility. These criteria embody societal values and objectives that transcend locations and provide a means to review the contributions of the plans in terms of these values and objectives.

Beyond specific designs

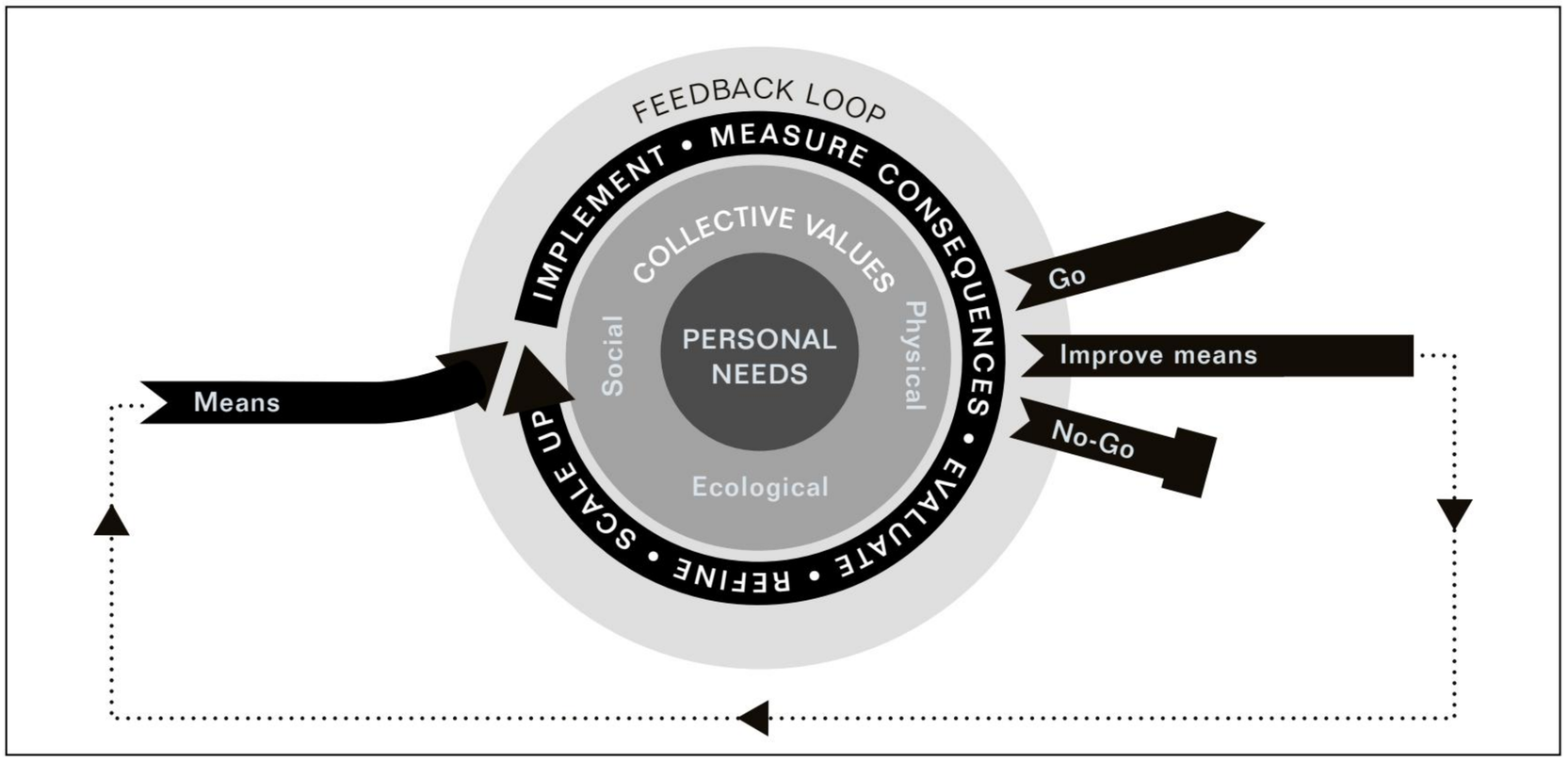
The scalability and broader application of a particular design to other locations may be limited due to its dependence on the unique conditions and context of a particular location. However, the selected approaches, applied principles, and design strategies are more methodical and instrumental, offering a broader domain of application. Any vision, spatial strategy and design could be of value to local stakeholders in initiating discussions and defining more specific policy or knowledge questions that could be resolved later. Designs at the idea formulation stage serve as explorative instruments rather than blueprints for implementation, as many decisions have yet to be taken. The process itself is valuable as it stimulates and facilitates collaboration between disciplines, sectors, and departments of the firms and municipalities involved. In everyday practice, linear processes and phases prevail, with various disciplines and sectors working successively and separately from general to specific, without influencing the initial idea, problem definition, or outcome. Collective learning and generating insights and practical knowledge within a design study serve both as an internalising activity and an externality beyond the designs themselves. These cognitive aspects form the foundation for broader applications, rather than the design itself, which is contingent on specific conditions.

Discoveries

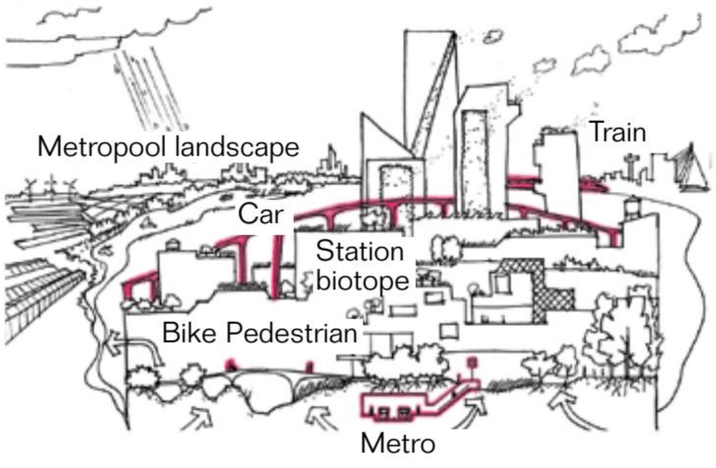
The study has yielded valuable insights and practical knowledge from the approaches and designs of the interdisciplinary teams. Three key discoveries have been made:

Discovery 1: The city of the future will not be an abstract tech city but rather a smart city made by and with people. It will offer many opportunities for creating more space and quality at the smallest scale, focusing on the experiences of the people living in their streets and neighbourhoods.

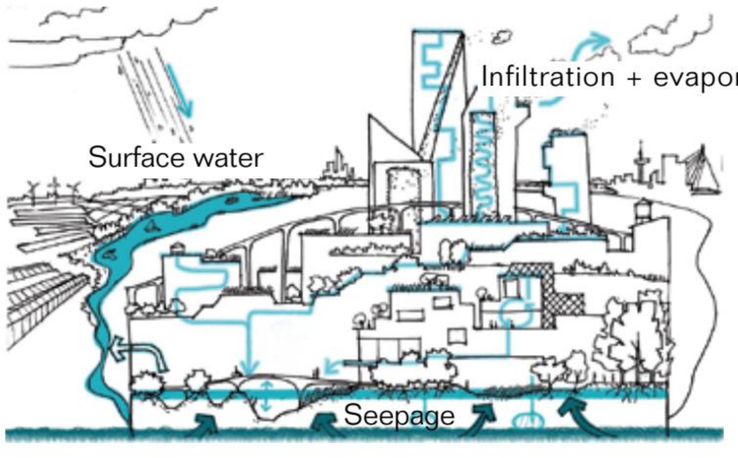
Amsterdam-Havenstad – Urbanities make the city; a robust and adaptive city prioritising its people
(Team INCity)



Rotterdam Alexanderknoop – The breathing city; proximity as a principle (Team CIAM XXI)



Mobility at every level



Water retention and circulation

Multilevel green spaces for health and Ecosystem for plants and animals

Rotterdam Alexanderknoop - The breathing city; proximity as a principle (Team CIAM XXI)

Discovery 2: The city of the future will rely even more a on multitude of functions, with more, mixed and temporary uses than the existing one. The power of proximity is being rediscovered. The spatial separation of working and living creates the need for mobility with all its external and adverse effects. Spatial integration, on the other hand, stimulates walking and cycling, social interaction, and an increase in quality time, replacing the daily commuting ritual.

Discovery 3: The numerous transactions will allow the city of the future to create a new balance between robust structures – such as those for energy, mobility, water and technology – and the flexible, creative contributions of residents and users at the district level. A frame- or network-based approach offers a defined solution space that allows local demands to fit in at different moments in time.

To provide concrete guidance for these discoveries, the study has identified several principles, design strategies, and implementation tactics, which are grouped into three categories: 1) *Starting Points, for the use of space*; 2) *The Design Compass*; and 3) *Stepping Stones*, to facilitate the smart organisation of design and development processes. Examples of the use of space include promoting mobility as a healthy and efficient connector and utilising the sub-surface. Examples for design are attention to proximity, function mix, and robust structures with flexible spaces. In terms of implementation, the study emphasises the need to focus on shared and social values to gain commitment. Additionally, the study suggests redefining existing planning instruments, such as blueprints or master-plans, as frameworks and transitional pathways.

This study had a significant impact on both local policies and national plans. The municipality of Rotterdam incorporated the location of Alexanderknoop in their high-rise policy during the study. Following the completion of the study, the location was added to the set of large city projects that aim to transform public spaces in strategic urban locations. The municipality of The Hague became more aware of the spatial implications of the desired densification through building and gave higher priority to space for climate adaptation.

Inspiring broader initiatives

The study also inspired the design study *Region of the Future* initiated by NOVI, with a focus on landscape, nature, agriculture, and regional economy as key factors (Regio v.d. Toekomst, 2019). The results of both studies were presented to a broader audience and were part of the presentation of *the preliminary national vision* in 2019. The Ministry of Infrastructure and Water management referred to the study in their *'Knowledge and innovation agenda for a future-proof mobility system'* on account of its methodological approach to the relationship between mobility and space. (Deel-KIA, 2019)

As a follow-up, the thematic focus and research-by-design approach were used in a series of sessions for smaller cities in 2020. These sessions aimed to assist the cities in rethinking problematic and strategic locations and taking first steps towards addressing these issues.

Living in a changing climate during periods of drought and heavy rains. Utrecht east city perimeter – Fit for the future, healthy city, healthy citizens.
(Team FIT)

Transdisciplinary explorations

The study involved a dedicated and extended preparatory phase aimed at defining local issues and locations, as well as assessing existing policies and demands. This is relevant for working within a transdisciplinary mode when the chance to influence present or future policies through spatial design seems limited. Policymakers and advisors need to pay close attention to the needs of the stakeholders to ensure that policy hypotheses are tested effectively, and tangible results are produced. However, a spatial design is not an instant as a prospect for action. Insights from spatial designs need to be incorporated into the broader policy context of political, financial, juridical, social, and technical topics. Spatial design is more of a signpost for a new direction in addressing the (re)defined problem. It should first question the problem statement and situation and then open up a new pathway or dialogue that provides new opportunities and insights, which in turn will stimulate policy discussions.

The project team, consisting of the core members BNA Research, TU Delft DIMI, and Delta Metropole Association, was responsible for organising and executing masterclasses, local studios, plenary sessions, and the final publication. The interdisciplinary teams dedicated substantial effort to analysing, envisioning, and designing their cases, partly funded by the study but mostly during their office study hours. The set-up encouraged knowledge sharing, production, and dissemination among all participants, including the municipal experts. The interaction between scientists and practitioners was crucial, as it allowed for the integration of formal conceptions of phenomena, patterns, and structures with practical experience and tacit knowledge. Both cognitive aspects were relevant in assembling and structuring information and data into knowledge.

Several student design studios and courses were connected to the main activities of the study and invited to participate. Designers from the teams were invited to review the students' results. Throughout the study, researchers from TU Delft's Chair of Management of the Built Environment and the Netherlands Environmental Assessment Agency (PBL) monitored the study and provided methodological, juridical, and spatial-planning perspectives. Additionally, the TU team working on the subsurface presented a six-step approach to integrating circularity in the Subsurface Equilibrium project. These related education and research activities exposed students to the practical and scientific aspects of the research-by-design method used in the study.

Shaping future urbanists

As a follow-up to the study, a cross-disciplinary graduation studio called *City of the Future* was established. The current third edition is embedded in the Master's programme of the Faculty of Architecture and the Built Environment. In the integrated design courses at the Faculties of Civil Engineering and Geosciences, the notion of transition challenges, as well as the spatial impact and embeddedness of transport infrastructures, were given a prominent position. These examples demonstrate that the project also had an impact on the curricula, which play an institutional role in educating current and future generations of students and in delivering graduates who are equipped to work on multiple transitions within a transdisciplinary context.

navigating complex challenges

Long-term system transitions

In line with the notion of Longue Durée, all designs proposed a system transition for various aspects, such as mobility, energy, and circularity, all related to a different use of public space. Neither the system transition nor the redesign of public space, including infrastructures, are standard commodities but processes with lead times of several decades, spanning several generations of graduates. Just as the effects of climate change gradually have a larger impact, the necessary social processes also take time to reach a threshold for action, sufficient political support, and a critical mass of professional capacity. The ability to change the built environment within a fixed timespan is limited, and changes will often be incremental, specific, and small-scale, and it may take generations to experience another sense of place.

CONCLUSION

Navigating complex challenges

City of the Future refers to the challenges that cities face in transitioning towards a more sustainable and liveable future and to the potential of research by design in addressing them. The aim was twofold: to create awareness about the complexity of these challenges and to propose a range of solutions for dealing with them. However, there are no simple answers; the solutions proposed are only a starting point for further investigation and discussion.

The study builds on previous design studies for the Zaancorridor, such as *Designing Transit Oriented Design (TOD)* (Van den Boomen et.al, 2014) and *Highway × City*. (Van den Boomen et.al, 2016) This study defined the scope of multiple transitions in connection with a series of masterclasses that provided relevant knowledge and expertise.

Pioneering smart solutions and educational synergy

The ambitions outlined in *City of the Future* (Berkers et.al, 2019) will take time to be realised due to the unpredictable pace and direction of politics and the inertia of change in the built environment. This requires a municipality to develop a prospect for action, followed by policy formulation and decision-making. Despite these challenges, professionals and future graduates are acutely aware of the transition challenges and remain committed to finding smart solutions within the defined scope of projects set by clients and commissioners. The integration of education with a design study stimulates thinking about the future by the next generation of professionals and provides insights into the practice and application of various disciplines.

On behalf of TU Delft, DIMI has played an active role in initiating design studies conducted by consortia with societal partners and connecting these with educational programmes. Following *City of the Future*, two other studies were initiated: *City × Climate* (Boer et.al. 2020) and *City x Space* (Boer et.al. 2022). The ability to act as a co-financer and to deploy dedicated personnel as a liaison between practice and academy from an interdisciplinary perspective, rather than from an exclusively financial perspective and objective, has contributed to this series of design studies.

Colophon

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