

# Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



## Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners ([Examencommissie-BK@tudelft.nl](mailto:Examencommissie-BK@tudelft.nl)), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Anouk Jansen
Student number	4575903

Studio		
Name / Theme	Design of the Urban Fabrics	
Main mentor	Birgit Hausleitner	Urban Design
Second mentor	Alexander Wandl	Environmental Technology and Design
Argumentation of choice of the studio	Using the power of design to paint a picture of possible trajectories into the future. As the central topic of the research is densification and this always alters urban form, the Design of the Urban Fabrics studio is most suitable.	

Graduation project	
Title of the graduation project	Building resilience: design strategies in planning for a densified Gelderland

Goal	
Location:	Gelderland
The posed problem,	As climate change will continue to impact inhabitation patterns in the Netherlands, it is logical that we will become more and more dependent on areas that are less exposed to its consequences. Gelderland is one of the regions which inevitably will have to house more people, but at the same time, its ecological and socio-economic qualities will be under pressure. Without planning ahead properly and in a way that suits Gelderland, opportunities could be missed and qualities lost.
research questions and	Main research question:  How can spatial transformations aid in providing a framework for more socio-economic and ecologically resilient neighbourhoods in Gelderland, in which the level of densification answers to the pressure on space?

	<p>Sub questions:</p> <p>How does resilience relate to morphology and how can this relationship be used as input for design?</p> <p>Which qualities should be assessed in designing for resilience and how?</p> <p>Which scenarios should be constructed to be able to answer to the possible pressure on space?</p> <p>Which location-specific conditions should be taken into account?</p> <ul style="list-style-type: none"> <li>• How did Gelderland as it is composed today came to be?</li> <li>• Which locations in Gelderland (will) pose risks or challenges for living?</li> <li>• Which local opportunities and qualities are to be found?</li> <li>• How could societal processes and transitions change the meaning of locations and their place in the system?</li> </ul> <p>Which locations in Gelderland will be most suitable for living in the future?</p> <p>How can we use densification to also make these areas more resilient?</p> <ul style="list-style-type: none"> <li>• How resilient are the focus locations currently?</li> <li>• Which existing densification strategies are there?</li> <li>• Which densification interventions that contribute to social-ecological resilience are possible in Gelderland?</li> </ul>
<p>design assignment in which these result.</p>	<p>A strategy and a design that works in favour of both Gelderland as well as the Netherlands as a whole, in which resilience is increased and the region is densified. This is done by studying urban form on multiple scale levels and through different time frames and scenarios.</p>
<p>[This should be formulated in such a way that the graduation project can answer these questions. The definition of the problem has to be significant to a clearly defined area of research and design.]</p>	

# Process

## Method description

[A description of the methods and techniques of research and design, which are going to be utilized.]

Research approach:

As the largest knowledge gap seems to be in the actualisation of policies or research results focused on sustainability and resilience into multi-scalar design, that is where the focus of the project will lie. All three of the design research categories as defined by Frankel and Racine will be incorporated in order to create a multi-facetted understanding of the challenge and to provide an extensive answer to it (2010). Research about design, or basic research, is continually, but in a gradually reduced amount, used to develop the design problem alongside with the solution. This way, knowledge that will appear in a later stage of the process, but that is however inherently important, can still find its way into the organisation and structure of the project. To be able to find the common ground between the different goals and theories, research through design, or applied research, is used. It also ensures that (part of) the results of the project will be transferable to other locations or situations. Applied research can aid in creating synergies between different fields, that can then be tested in clinical research, or research for design. As this project aims at proposing a strategy and design specifically for Gelderland, research for design is used to actualise the assembled knowledge for the test location.

Chapter	Subquestion	Method									
		literature review	spatial analysis	historic analysis	cognitive mapping	case study	scenario construction	strategy & governance	design & test		
Design pillars	How does resilience relate to morphology and how can this relationship be used as input for design?	◆			◆						
Scenarios	Which scenarios should be constructed to be able to answer to the possible pressure on space?	◆			◆		◆				
About Gelderland	Which location-specific conditions should be taken into account?										
	How did Gelderland as it is composed today come to be?	◆	◆	◆	◆						
	Which locations in Gelderland (will) pose risks or challenges for living?	◆	◆								
	Which local opportunities and qualities are to be found?	◆	◆				◆	◆			
	How could societal processes and transitions change the meaning of locations and their place in the system?	◆			◆		◆	◆	◆		
Regional design	Which locations in Gelderland will be most suitable for living in the future?		◆			◆		◆	◆	◆	
Urban design	How can we use densification to also make these areas more resilient?										
	How resilient are the focus locations currently?		◆							◆	
	Which existing densification strategies are there?	◆				◆	◆			◆	
	Which densification interventions that contribute to social-ecological resilience are possible in Gelderland?					◆		◆	◆	◆	
Assessment framework	Which qualities should be assessed in designing for resilience and how?				◆			◆			

## Methods:

### Literature review

To position the project within the broader context of existing knowledge, an overview and analysis of relevant findings, theories and gaps in literature is given. It provides the base of knowledge on which the remainder of the research can be built. The project seeks value in finding synergies or overlap between theories and applying them in a specific context.

### Spatial analysis

To understand the geographic distribution of phenomena and variables and the relationships and patterns that exist between them, spatial analysis is used. This is carried out predominantly with the use of Geographic Information Systems (GIS) and with a multi-scalar approach. The most commonly used scales are identified as national, regional, municipal, urban, neighbourhood, district, fabric, island, lot and building.

### Historical analysis

This method is used to understand past events, trends and patterns that have shaped the present and inform the future. In order to make sense of urban areas that exist in Gelderland today and their physical, social and cultural characteristics, it is crucial to recognise the processes that were that formed the basis for it. This is done by archival research and the analysis of historical maps, photographs and written documents.

### Cognitive mapping

Cognitive mapping is applied for the explanation of different concepts and lines of thought through visualisation. It is also helpful as a first step in the process of translating theoretical or abstract concepts into the spatial dimension, or vice versa: presenting spatial conditions or processes in a diagrammatic way, to reveal an understanding of its systematic or metabolic properties.

### Case study

Though the location of the research is very central in the project, Gelderland is still used as a case study to analyse and test processes and design options in practice. The multi-scalar approach allows for the method of using case studies to be able to compare between locations, to see if and how application of theory has different outcomes in different locations and circumstances. It is also used to test how desirable design and strategy alternatives may be in the various proposed scenarios.

### Scenario construction

The construction and exploration of different scenarios is a method to deal with uncertainties and potential future states of a system. Scenario construction allows for the exploration of a wide range of possibilities, providing a more comprehensive understanding of the potential impacts of different design and planning decisions. It can be used as a tool for strategic urban planning, helping to identify potential challenges and opportunities for future urban development. The focus is hereby not necessarily on predicting a plausible future, but on drawing up an image of a possible one (Salewski et al., 2010). By imagining multiple variants of the future, we can also uncover similarities between them, parallels that reveal opportunities or threats that prevail no matter what the trajectory is.

### Strategy & governance

Though the research is mostly focused on the spatial conditions that dictate the functioning of systems, strategy and governance are important tools in providing a complete proposal. The research and design of strategic and regulatory interventions can provide insight into the decision-making processes, policies and regulations that shape the urban environment, as well as the distribution of power and resources of different actors. This method is used to evaluate the effectiveness of existing governance structures, and to identify potential opportunities for improving decision-making and fostering more inclusive and sustainable urban development.

### Design & test

Designing and subsequently testing the design are important methods to bring the project to a more practical or pragmatic level. It allows for evaluation of the effectiveness and usability of solutions in a specific urban environment. When designing and testing is employed as an iterative process and is combined with the other methods described, it can be the basis of innovative and unexpected solutions.

## Literature and general practical preference

[The literature (theories or research data) and general practical experience/precedent you intend to consult.]

Key concepts & theoretical framework:

- Resilience (panarchy, evolutionary resilience)
- Morphology (space syntax, layer approach)
- Densification (space matrix)

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## Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

The relationship between the topic of my graduation project and my studio of choice is that morphology plays a prominent role in both my research as well as in the design of the Urban Fabrics studio. The relationship between physical environments and socio-economic and ecological processes is explored in depth, in the search for solutions for creating more resilient neighbourhoods. The relationship with my master track, Urbanism, is most visible in the scales on which the project focuses: the province of Gelderland as a region, with zoom-ins on multiple other test cases. The multiscale approach combined with the focus on urban form make that this graduation project could not have been carried out if I was enrolled in any of the other master tracks. This does not mean, however, that the project is dismissive of the other tracks in the AUBS master programme, as the topics studied in those tracks also impact the resilience of complex urban systems.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

### Scientific relevance

The research project aims at further development of the existing research on resilience theory within the field of urbanism, because while the foundations for resilience theory have been laid some time ago, applying it within the context of urban development is relatively new and unexplored territory. There are examples which use resilience as a basis for design, but these are often limited to the urban scale. By also incorporating it in regional design, new knowledge might be uncovered. The research also aims at adding to the relatively small body of literature that does not

just look at either ecological, social or economic resilience, but seeks holistic solutions by approaching it through the framework that they share. This integral approach and nuanced view on the layer model might shine light on new opportunities in regional and urban design. The practical approach, taking Gelderland as a case study, could then be especially valuable, as this region has not been used as a location for examining and attempting to increase resilience through design. Apart from the theoretical framework and finding synergies between resilience, morphology and densification, the study of Gelderland itself could be a beneficial asset in the revaluation of regions outside of the Randstad. The body of literature on (historical) urban development in Gelderland is rather limited, or so specialised that it falls short in giving a complete overview. This research also aims at providing a better understanding of Gelderland and its characteristics and qualities, so that further research and/or design may be easier carried out.

#### Societal relevance

Increasing the understanding of and resilience to what we will have to face in the future, can mean the difference between an overwhelmed, unprepared and exhausted society or an innovative and optimistic one. The struggle of turning the numbing fear of the consequences of climate change into a hope that things can change can be helped by showing how they could change. Getting more people on board of the transitions towards a more sustainable future is very difficult without giving them some evidence or examples with which this hope can be encouraged. If people have no hope for the future, it is unlikely for them to go out of their way to try to change it for the better.

#### Ethical considerations

With inclusivity and the interests of future generations of inhabitants being at the core of this research, it deals with the question of (in)justice in many ways. The aim is to show the possibility of a more just society, so it is also important to take the current inhabitants and nature into account. In planning and designing for the future, it is only logical that in some instances, we will have to make sacrifices today to be able to build a secure future. It is important, however, that both the compromises as well as the gains are balanced between all groups and stakeholders. In order to avoid some groups paying the price for others to benefit, an analysis of all stakeholders and their needs, resources and power should be made.

The notion of risk also always comes with ethical questions, as it difficult to objectively decide at which point a certain risk is acceptable. The people or elements exposed to the risk have different vulnerabilities and capital, so the costs of a disastrous event would never be borne in an equal or just way. By taking a larger timeframe and trying to respond to risks over the long term, however, the hope is that risk will be averted in a tempered and manageable pace before it is too late.

Even though densification is thought to aid in reaching sustainability goals in most cases (Berghauser Pont & Haupt, 2021; College van Rijksadviseurs, 2022; Salat & Bourdic, 2012; Sharifi, 2019), urban development and construction takes a heavy toll on the environment and is very costly. Therefore, the project should take into consideration that any proposed design would need to weigh against this and other negative side effects it causes. Therefore, nature-based solutions should, alongside the focus on resilience, be taken into account.