


# Encl sed



Comparative research about courtyards  
in West and East Europe

**Technical University Delft, MSc Architecture**  
**MSc3 AR3A010 Research Plan**

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This document is the preparation, the Research Plan, for the upcoming research. The goal is to formulate research questions, frame the research by the existing theories and define how the research will be carried out. Enjoy.

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Amsterdam  
05-11-2021

**Keywords:** Courtyard,  
Architecture, Amsterdam,  
Belgrade.

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# Introduction

## Courtyard

### *Noun*

“An area of flat ground outside that is partly or completely surrounded by the walls of a building”<sup>1</sup>.

The motivation to start this research about courtyards comes from a personal fascination. This fascination is based on three reasons:

First, courtyards have been used since the Neolithic period (around 3000 BCE<sup>2</sup>) to protect against the climate (sun, wind and humidity<sup>3</sup>) and unwanted people (offering security). Second, the (semi-) private character of courtyards hold a community feeling. Thirdly, the courtyards are quiet oases within city blocks in comparison to the noisy city streets. Thus, the courtyard proved to be a rigid and useful building typology over many millennia of changing climates, cultures and needs.

The Graduation Studio ‘Positions in Practice’ from the course ‘AR3MET105 Methods and Analysis’ strive to “encourage students to adopt individual positions as architects based on their choice and use of those instruments and methods in analysis and practice (MSc3/4 – Positions in Practice). As part of this sequence, the aim of the studio where you will develop your graduation project is to merge architectural analysis and design to face the social, political, and spatial questions that define the contemporary city beyond the western European context.”<sup>4</sup>. This made me realise my knowledge mainly relies on Western European context. This research will not only be an addition to the knowledge on courtyards but also broaden the scope from Western Europe to Eastern Europe. This links the research to the aim of the studio.

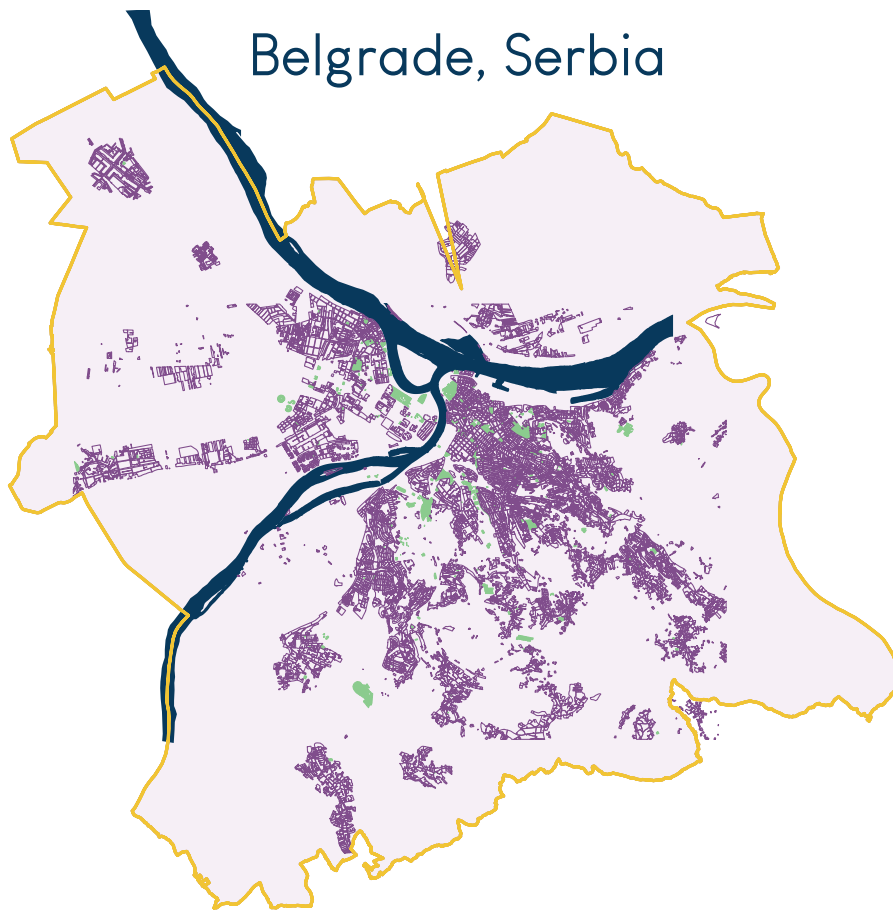
1 Cambridge Dictionary, “Courtyard,” Cambridge Dictionary, accessed October 14, 2021, <https://dictionary.cambridge.org/dictionary/english/courtyard>.

2 Zhang, Donia, ‘Courtyard Housing and Cultural Sustainability Theory, Practice, and Product’, 5; Sanjonee and Guneratne, ‘Morphology of the evolving courtyard’, 108; Pica, Relationship between Urban Morphology and Patio Housing, 77.

3 Taleghani, Tenpierik and van den Dobbelsteen, Environmental impact of courtyards, 122.

4 Methods of analysis and imagination, “Syllabus” (Delft, 2021), 3.

**Figure 1:** Map of Belgrade.  
Image by the author.



The site for the graduation studio is Belgrade, the capital of Serbia.

## 1.1. Problem statement

Belgrade deals with a multi-layered housing problem. One of the main issues of socialist countries, in particular Yugoslavia and Belgrade, is housing<sup>5</sup>. After the first world war, Belgrade became the capital of the newly formed state of the Kingdom of Serbs, Croats and Slovenes/ Yugoslavia. The declaration of the new capital caused a large immigration stream towards Belgrade. The issue of inadequate housing increased because the population doubled in the first ten years by the migration stream<sup>6</sup>.

The high urge for housing in the interwar period triggered the construction of large-scale housing in New Belgrade, across the river of Old Belgrade. The upcoming of capitalism in this period led to modern housing and informal housing<sup>7</sup>.

Cheapness and fastness were key to comply with the huge demand. This was done with rationalization, standardization and optimization of design<sup>8</sup>. Prokopljivic argues that the huge housing production is not always in line with the needs and purchasing power of the people.

The city expanded so rapidly that it led to other housing issues: illegal construction and, according to Samardžić et al., unhealthy wild settlements<sup>9</sup>. In the post-socialist period, the construction of illegal housing exploded<sup>10</sup>. Illegal construction continued as part of the urbanization process till the early 1990s by the procedure of legalizing illegal constructions. Nevertheless, it did not stop the continuation of this illegal construction phenomenon<sup>11</sup>. In total 43% of the housing

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5 Prokopljivic, "Do Not Throw Concrete Blocks! Social and Public Housing in New Belgrade and Their Representations in Popular Culture." *Fusion Journal*, 1–18.

6 Samardžić et al., "The Challenge of Living in Belgrade 1918-1941: Housing, Disease and Malnourishment.", 279.

7 Branislav, "How to Understand the History of Housing Planning in Modern Serbia to Achieve New Quality in Housing?", 165.

8 Dragutinovic, Pottgiesser and Melenhorst, "The Minimum Dwelling: New Belgrade Flat and Reflections on the Minimum Today", 352.

9 Samardžić et al., "The Challenge of Living in Belgrade 1918-1941: Housing, Disease and Malnourishment.", 290.

10 Branislav, "How to Understand the History of Housing Planning in Modern Serbia to Achieve New Quality in Housing?", 171.

11 Zegarac, "Illegal Construction in Belgrade and the Prospects for Urban Development Planning", 365.

area is occupied by informal settlements in Belgrade<sup>12</sup>. This data shows the scale of informal settlements and the lack of control that urban planning can offer.

Another problem in the capital of Serbia is the high rate of homeownership. “In the early 1990s Serbia’s large public housing stock was privatized and sold to individuals and families at symbolic prices, which explains the high rate of home-ownership. However, homeownership does not guarantee adequate housing.”<sup>13</sup>, noted the UN Special Rapporteur. This raises the question how accessible the Serbian housing market is for starters. Lower accessibility to social housing and unaffordable rents in the unregulated private rental sector are the two results of the privatization of the housing market<sup>14</sup>.

The badly accessible social housing and rental market have consequences for the people,

three groups in particular. The first group is the refugees. Former barracks on the site of the luxurious Belgrade Waterfront project housed roughly 1000 refugees<sup>15</sup>, before it was demolished. The second group is the Roma population in Belgrade. Living mainly in slums<sup>16</sup>, the Roma are a segregated and vulnerable group<sup>17</sup>. The third group is the homeless people. High unemployment, poverty, social exclusion and undeveloped social housing policy are the main contributors for the complex homelessness situation in Belgrade<sup>18</sup>. Sarajlija et al. add to the discussion that it is also health-related with non-hygienic dwellings<sup>19</sup>. The different housing problems are all interrelated.

Thus, the multi-layered housing problem of Belgrade consists of inadequate housing, informal housing, illegal construction, wild settlements and a high rate of home-ownership that causes bad accessibility to the (social)

12 Radulovic et al., “Informal Growth of Housing in Belgrade under the Impact of Transition to Global Economy”, 2.

13 Leilani Farha , “Serbia’s Housing Crisis Demands Immediate Action, Says UN Housing Expert ,” ACNUDH | Serbia’s housing crisis demands immediate action, says UN housing expert (UN Human Rights, May 26, 2015), <https://www.ohchr.org/SP/NewsEvents/Pages/DisplayNews.aspx?NewsID=16007&LangID=E>.

14 Petrović and Timotijević, “Homelessness and Housing Exclusion in Serbia”, 267.

15 Obradovic-Wochnik, “Urban Geographies of Refugee Journeys: Biopolitics, Neoliberalism and Contestation over Public Space in Belgrade”, 65.

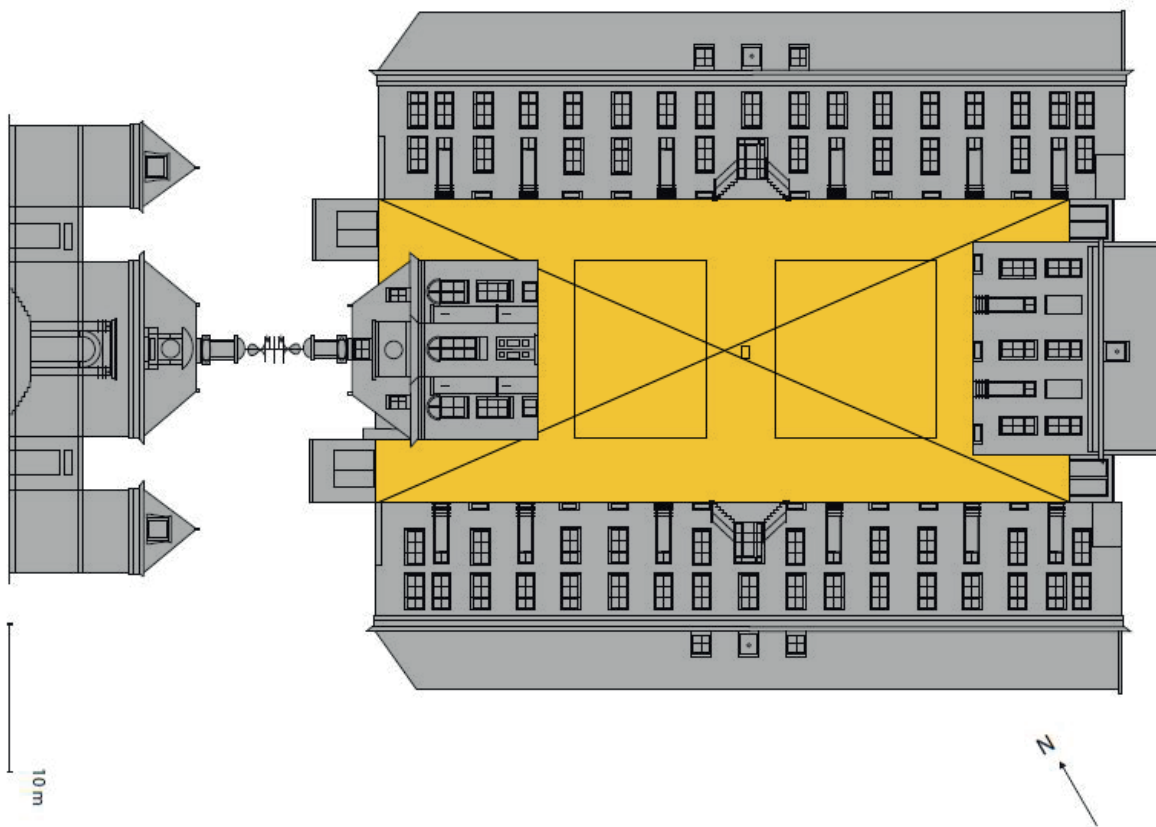
16 Knežević, “Demographic Characteristics Of Roma Population in Belgrade as an Indicator Of Their Social Integration”, 54.

17 Knežević, 53.

18 Petrović and Timotijević, “Homelessness and Housing Exclusion in Serbia”, 283.

19 Sarajlija et al., “Assessment of Health Status and Quality of Life of Homeless Persons in Belgrade, Serbia”, 168.





**Figure 2:** Hofje van Brienen, Amsterdam. Drawing by Wilms Floet, *Het Hofje 1400-2000, (on)zichtbare bouwstenen van de Hollandse stad*, 212., edited by author.

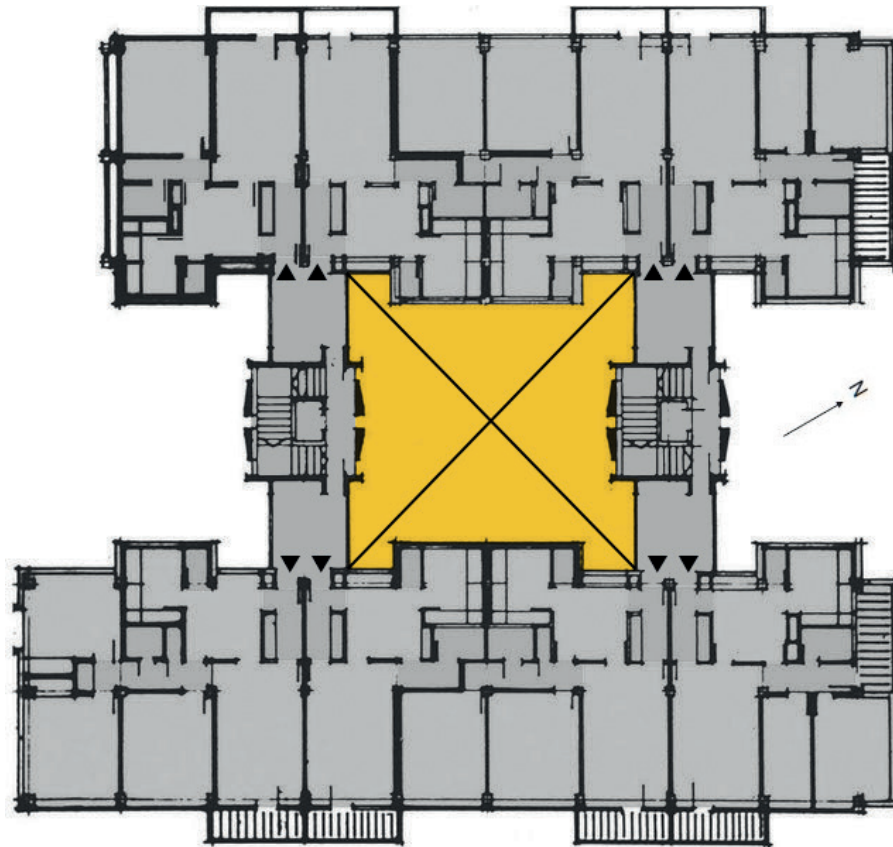
housing market of Belgrade and affects mainly the lower classes of society. This is an opportunity to create sufficient affordable and diverse housing that is fit to the people's needs. How can this be achieved?

First, an example of a Dutch courtyard: the 'hofje'. A 'hofje' is a Dutch courtyard typology. It is a collection of one-room dwellings situated around an inner courtyard with a gate<sup>20</sup>. Founded as a charity by rich merchants, it offered

social security for the poor elderly. An example of a hofje can be seen in figure 2. Relating this courtyard example to the housing problem in Belgrade leads to the question: How can the Dutch example of housing for the poor be applied to the homelessness, refugee- and housing problems in Belgrade? This shows how the research about courtyards in West and East Europe is relevant beyond the borders.

<sup>20</sup> Renes, *Historische Landschapselementen*, 71.

**Figure 3:** Example of a courtyard inside a double-tract in block 29, New Belgrade. Drawing by Djordje Alfievic and Sanja Simonovic-Alfievic, “Double-Tract Unit in Residential Architecture in Serbia”, 10., edited by author.



Second, an example of a courtyard typology present in Belgrade is the ‘double-tract’. This courtyard typology is mainly present in Belgrade compared to the world and its purpose is to maximize the number of apartments. An example of the double-tract unit can be seen in figure 3. The typology is oriented towards multiple-family residences<sup>21</sup>, which is adding to the non-diverse housing stock. There is potential to further utilize

the courtyard to diversify the housing stock and improve living quality. What kind of courtyards are present? What are the qualities? And how can this knowledge be implemented to act as a solution for the housing problems in Belgrade, Serbia? The relevance of the courtyard is made visible by two courtyard examples in West and East Europe.

<sup>21</sup> Djordje Alfievic and Sanja Simonovic-Alfievic, “Double-Tract Unit in Residential Architecture in Serbia”, 7.

## 1.2. Research questions

The main research question is:  
How do the courtyards of West and East Europe compare and differ to act as a solution for the housing problems in Belgrade?

The main research question will be answered with the help of the following subquestions:

1. What kind of courtyard typologies are present in the capital cities of the Netherlands and Serbia, and what are their characteristics?
2. What are the spatial and social qualities of courtyards in Amsterdam and Belgrade?
3. How can the courtyard examples of the capital cities of the Netherlands and Serbia be a solution to the housing problems in Belgrade?

### **Hypothesis:**

A courtyard that is utilized at ground level strengthens the social cohesion inside the building complex, which could act as a solution to homelessness and refugee problems in Serbia. Furthermore, the courtyard typology could be an addition to the housing stock of Belgrade and diversify it. Lastly, the courtyard typology of the hofje is a cheap way to offer more affordable housing to the less wealthy population of Belgrade.

# Research framework

## 2.1. Key terms, concepts, theories

Mankind was subjected to nature in prehistoric times. A shift started with the invention of dwellings, which resulted in a barrier between man and nature. The courtyard was a means of restoring the interaction with nature by bringing it inside the boundaries of the house<sup>22</sup>. Besides linking in- and outdoor with each other, the courtyard is traditionally used as a spatial organisation principle<sup>23</sup>. The functions of the courtyard are providing sunlight, protection by enclosure, climate control, leisure and socialization<sup>24</sup>.

What is a courtyard and when it is not? To fully understand the courtyard, we need to dive into the terminology. The courtyard is a central space, open to the sky and enclosed by four built forms<sup>25</sup>. A courtyard is a court

within or adjacent to a building, in particular one surrounded by four boundaries<sup>26</sup>. In Chinese culture, a courtyard can also be referred to as a lightwell or skywell<sup>27</sup>, focussing on the light it provides. Two characteristics come forth out of the definitions of the courtyard. The first characteristic being visible is that a courtyard is an open space, open to the sky. The second characteristic is that a courtyard is enclosed mainly on all four sides.

A courtyard can be inside or adjacent to a building. Abass et al. made a topological distinction between the inner courtyard (interior) and the adjacent courtyard, the terraced house (exterior)<sup>28</sup>. See figure 4. Guy Petherbridge goes deeper into this notion<sup>29</sup>. An interior

22 van der Straaten, Europe's Evolution of Atrium Houses, 11.

23 Sanjune and Guneratne, 'Morphology of the evolving courtyard', 106.

24 van der Straaten, Europe's Evolution of Atrium Houses, 11.

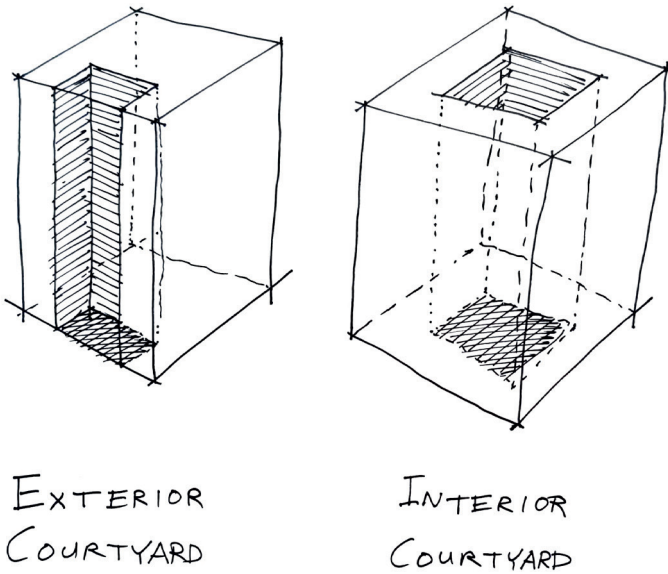
25 Sanjune and Guneratne, 'Morphology of the evolving courtyard', 106.

26 Ching, Architecture Form, Space, and Order, 380.

27 Zhang, Donia, 'Courtyard Housing and Cultural Sustainability Theory, Practice, and Product', 6.

28 Abass et al., "A review of courtyard house", 2557.

29 Petherbridge, G, The house and society. The Architecture of the Islamic World.



EXTERIOR  
COURTYARD

INTERIOR  
COURTYARD

Figure 5: The exterior courtyard compared to the interior courtyard. Image by author.

courtyard has a courtyard surrounded by dwellings. An exterior courtyard has a courtyard that is not enclosed by the house(s), but offers a protective area in front. These theories frame the definition and categories of courtyards.

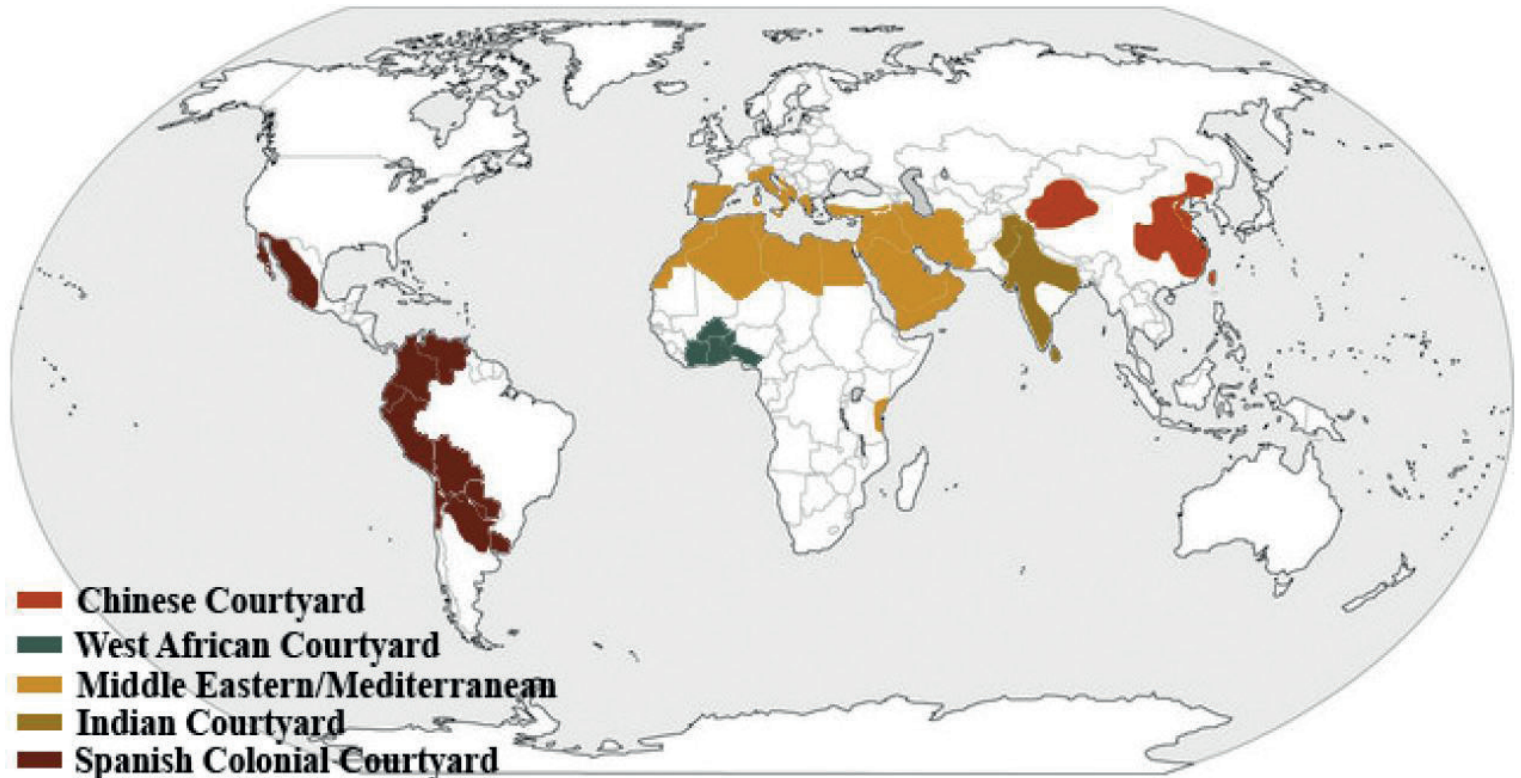
Courtyards are used for over five millennia and across the world. Taleghani et al.

have mapped the spread of courtyards over the world. Courtyards are located in different human civilisations, cultures and climates.

The location of courtyards over the world is concentrated around the equator. The reason for this is the climate benefits that courtyards bring, such as shading, more comfortable temperatures, due to the microclimate it creates, and protection against wind.

This map implies the dominance of Mediterranean courtyards in Europe. This is the profound location where courtyards are present in Europe, but courtyards are also present in other parts. This research will focus on the comparative analysis of courtyards in West and East Europe.

Figure 4: Mapping of courtyard spread over the world. Taleghani, Tenpierik and van den Dobbelsteen, Environmental impact of courtyards, 118.



- Chinese Courtyard
- West African Courtyard
- Middle Eastern/Mediterranean
- Indian Courtyard
- Spanish Colonial Courtyard

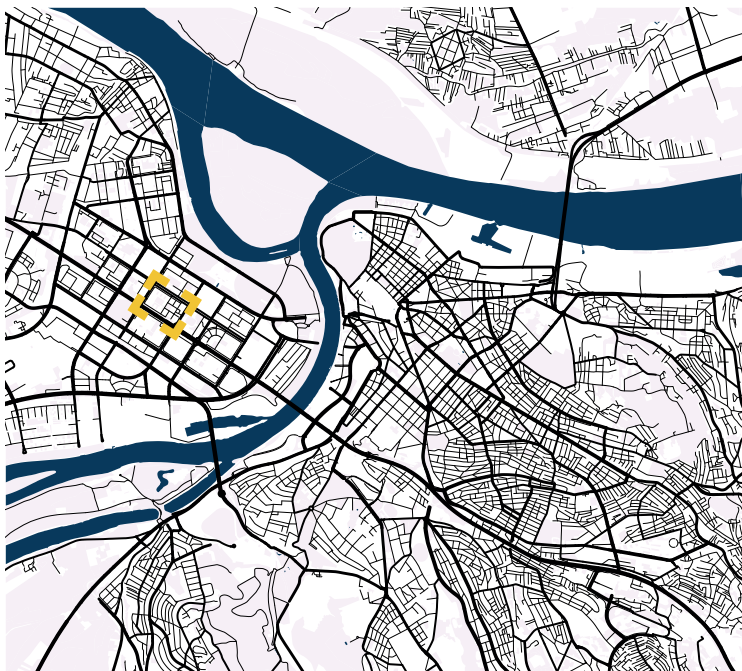
## 2.2. Methods and methodology

The comparative analysis of courtyards in West and East Europe will be conducted by using the methodology of typology/morphology. To limit the research, the capital city of the Netherlands for West Europe and the capital city of Serbia for East Europe will be taken.

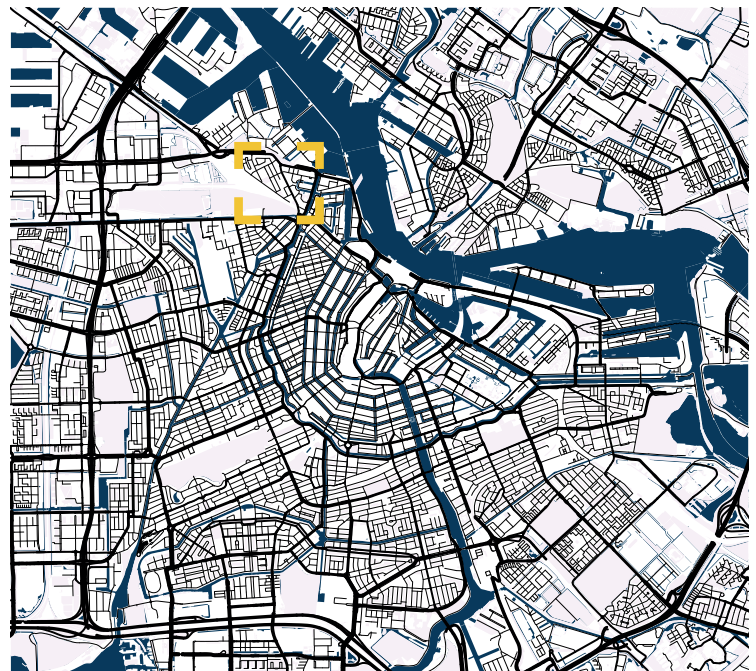
The first subquestion of this research wants to know what types of courtyards are present in the capital cities of the Netherlands and Serbia, and what characteristics they have. To answer this, the methods of using maps, google maps and satellite images will be applied to gather the data of the current courtyards in 2021. A map of each city will be made with an

overview of the courtyards. In addition to this grant overview map, the data of the present courtyards will be displayed in the scale of each district of the city to better show the positions of the courtyards within the urban structure. To provide an impression of the different courtyards in the two cities, an excursion to Amsterdam and Belgrade was made to photograph several courtyards. The photographs of the courtyards will be numbered in the overview maps to see the relation with the position within the cities. A beginning of this has been made, which is visible in figures 8 and 9. This gives an overview of all the courtyards and types in Amsterdam and Belgrade.

**Figure 6:** Map of Belgrade, Serbia. 1:200000. Yellow indication for the map of figure 8. Image by the author.



**Figure 7:** Map of Amsterdam, the Netherlands. 1:200000. Yellow indication for the map of figure 9. Image by the author.



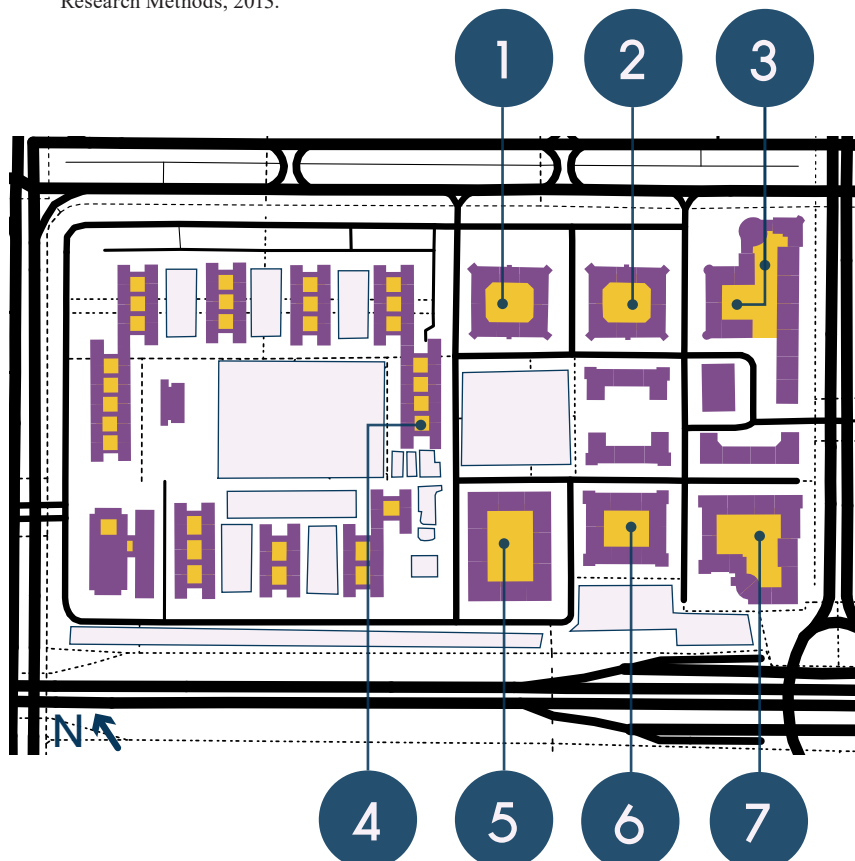
The second subquestion goes into the spatial and social qualities of courtyards. After the overview of the courtyards in Amsterdam and Belgrade of the first part, the courtyards will be categorised. Out of all the courtyards, four examples will be picked to be studied. Two examples out of Amsterdam and two examples of Belgrade. The architectural methods are backed by the research methods of Linda Groat and David Wang<sup>30</sup>: qualitative research and case studies. The four case studies will be analysed, compared and visualised by plan analysis. For this the architectural drawing methods of isometries, sections and

floor plans will be applied. The four courtyards will be set side by side to their geographical location, situation, building data and configuration.

Thirdly, the last subquestion focuses on the translation of the conclusions and patterns of the case studies to concrete design principles. The formulated design principles could offer a possible solution to the housing problems in Belgrade. The research diagram embodies the research steps.

The research objective is to get insight into the hidden qualities of the courtyard typology in West and East Europe and make them tangible.

30 Groat and Wang, *Architectural Research Methods*, 2013.



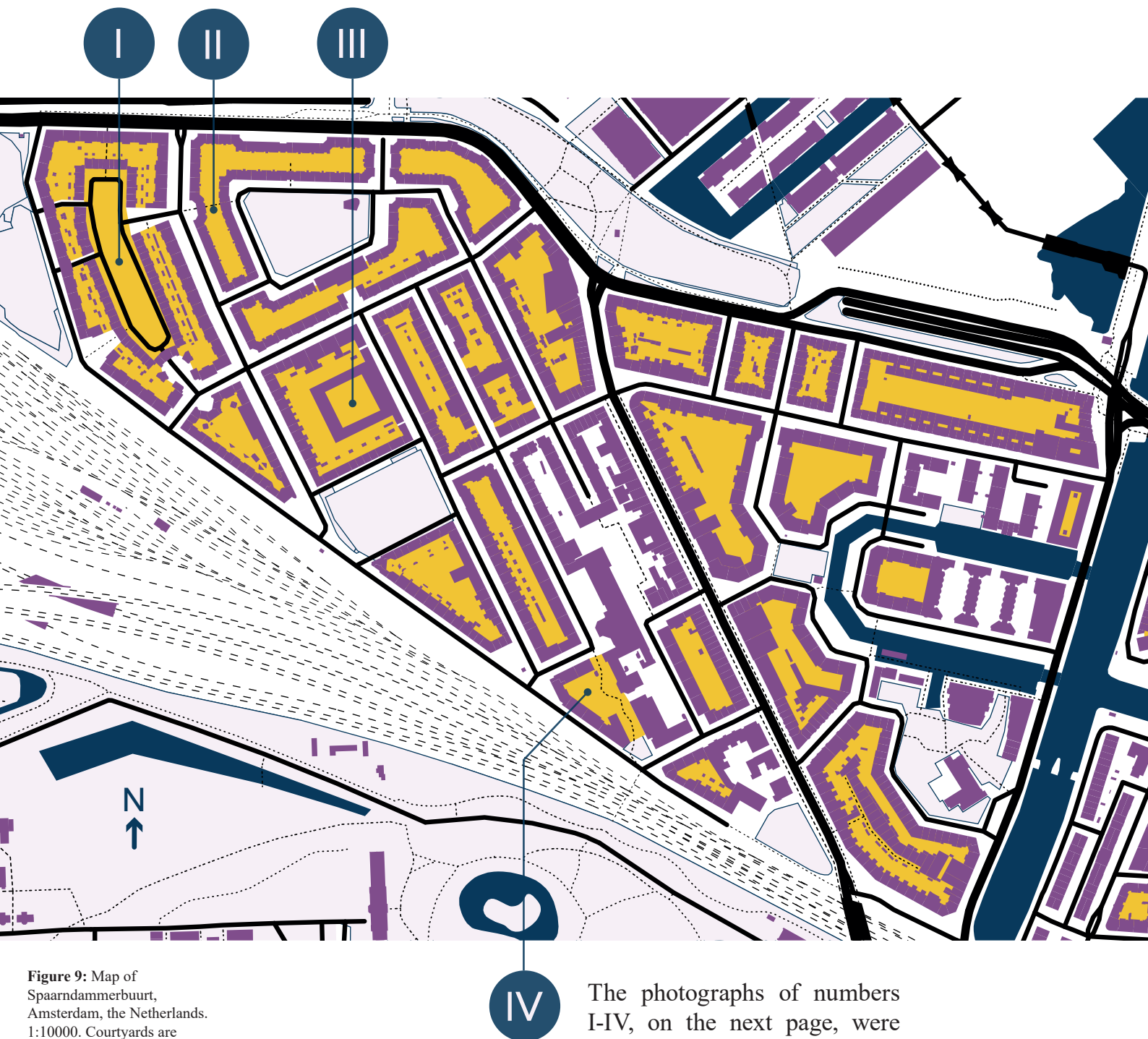
**Figure 8:** Map of block 29, New Belgrade, Serbia. 1:10000. Courtyards are highlighted in yellow. Image by the author.







The photographs of numbers 1-7 were taken on 23-10-2021 in Belgrade, Serbia.



**Figure 9:** Map of Spaarndammerbuurt, Amsterdam, the Netherlands. 1:10000. Courtyards are highlighted in yellow. Image by the author.

The photographs of numbers I-IV, on the next page, were taken on 28-10-2021 in Amsterdam, the Netherlands.



# Preliminary conclusions, choices and design strategies

The preliminary conclusion of this research about courtyards is that the courtyard typology is present in West and East Europe, besides the Mediterranean area. There must be noted that different courtyard types are found in different locations. For example, the hofje type in the Netherlands and the double-tract unit in Serbia. Both evolved in diverse contexts and probably have different qualities. What the qualities of the various courtyard types in the Netherlands and Serbia are, will be the final conclusion of this research.

From the 21st of November to the 25th in 2021, the Methods and Analysis group and I went to visit Belgrade. For my personal research about the courtyards, I was happily surprised to see that there were more courtyards present than I initially anticipated. This laid

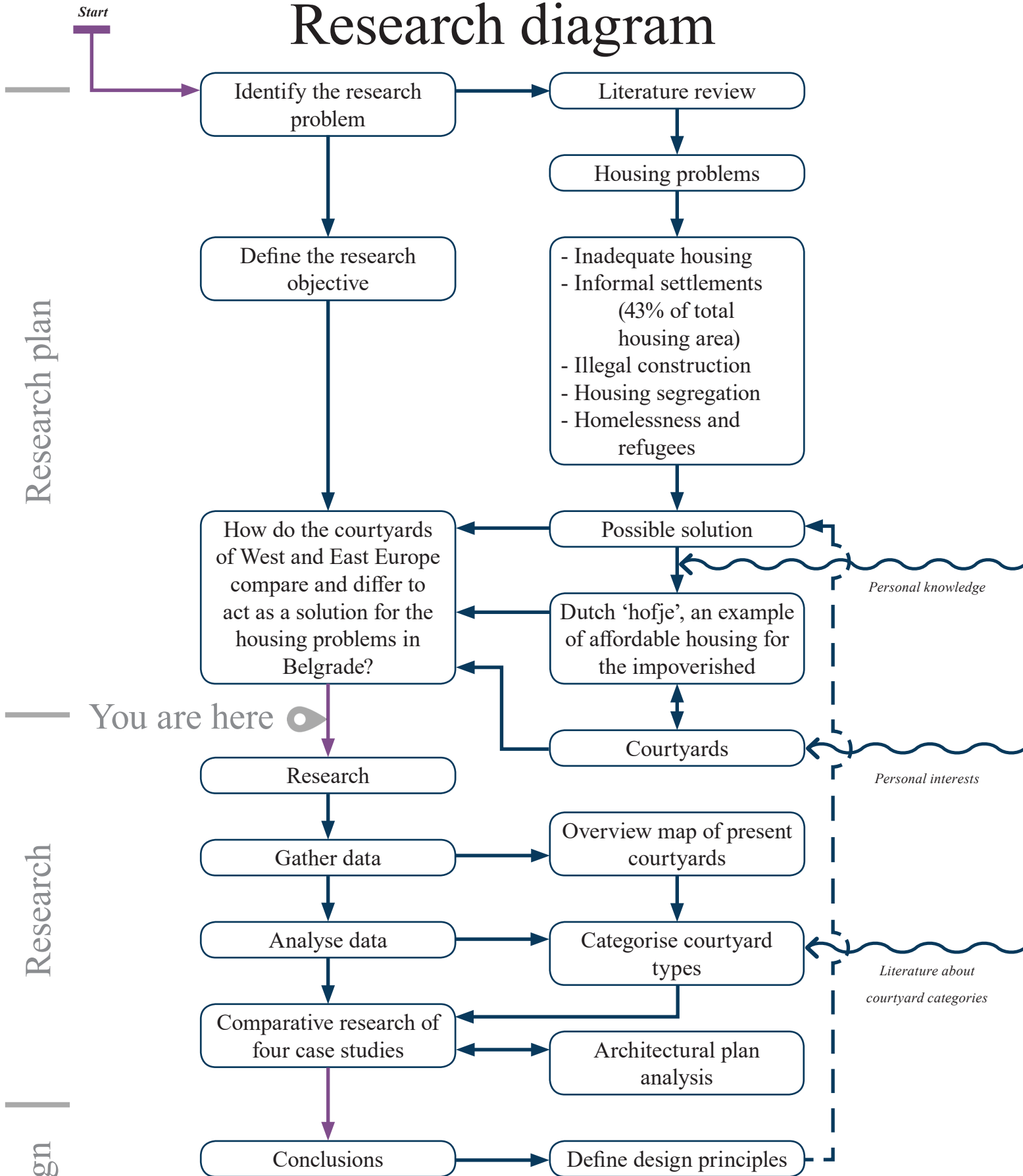
a firmer foundation for the comparative research about courtyards.

Within the first part of the methods and analysis studio, a group member and I conducted research on streets. In particular how streets are an extension of the home; 'The Street as a Public Home'. A couple of insightful lessons arose from this investigation. Streets are public, can be appropriated by their users and be utilised as an extension of home or business. As for the morphological lessons, street type, street function, commercial spaces accessible from the street and street facades influence if and how the street is appropriated. Especially the last two of these lessons, I want to incorporate into my design.

My design proposal will be a housing complex inside Belgrade. In the plinth commercial spaces. In combination with this an open facade, at least on eye level of the pedestrians.

The size of the building will be on the scale of a building block to learn how to connect the building to four, most likely different, adjacent streets and be able to make a difference in the type of housing that will be offered. Lastly, in my opinion, it is important to mix users, providing high-end and low-end living spaces, to unify and have mutual understanding instead of creating separation. The courtyard typology facilitates the conditions to achieve these ambitions. To put this into design and research questions: How to design a building the size of a building block/city block? How to connect a building to four different adjacent streets? And, how to design mixed functions in one building? Thus, designing mixed housing with business opportunity spaces in the plinth inside a whole building block to connect to the people, the four adjacent streets and the city.

# Research diagram



Research diagram

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