

AR3A010 - Research Plan - 04-11-2021  
AR3AD100 - Advanced Housing Design - Ecology of Inclusion  
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# HOUSING INTERSPECIES IN THE CYBORG CITY

*Research Plan*

An architectural research into the aspect of cohesion between different species in a cooperative housing project.

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## Background information:

This research is being done to assist the graduation studio of Advanced Housing Design, to develop an urban housing laboratory that is socially inclusive and ecologically sustainable and economically viable under the premise of long-term non-speculation<sup>1</sup>. The project site is Blijdorp, Rotterdam, and contains different structures, functions and residents. A new master plan has been drawn up in a group (ecology group), which is used as the main scene for this research. Whereafter two topics from a given list (one for ecology and one for inclusion) have been chosen to continue working with and do research in. For me the topics are:

- Ecology: Cohabitation with other species.
- Inclusion: Creating diversity by including different and changing household types.



*Masterplan of the site by the Species group. Indicated is my individual plot.  
Made by: species group*

<sup>1</sup> Course Guide, Kockelkorn, A. Klijn, O. (2021) *Advanced Housing Design, Ecologies of Inclusion*

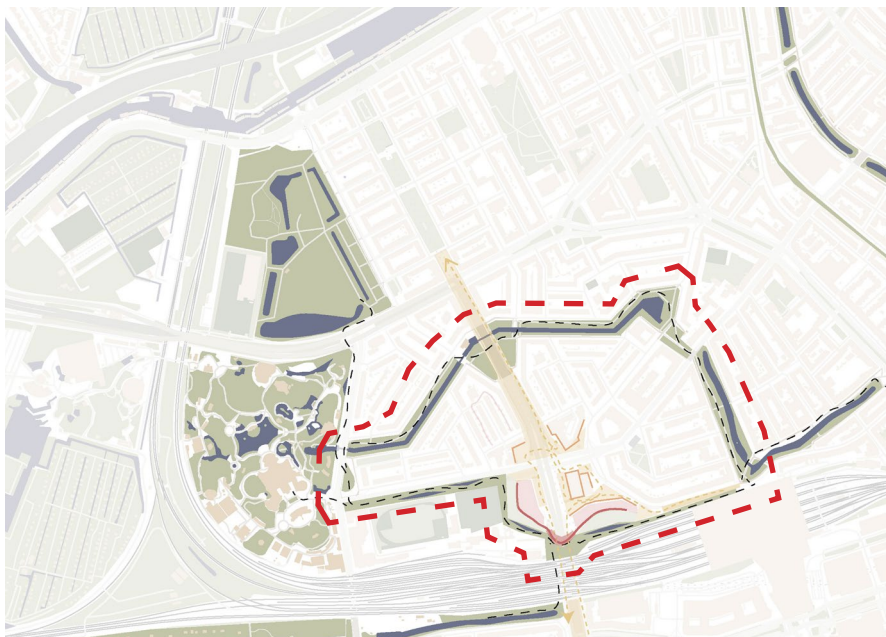
# 1. INTRODUCTION

## Urban Metabolism

Recently climate change has been hyped more than ever. In recent years "nature" is again an important part of the social agenda, due to global urbanisation. However, we can no longer assume that nature is a force that will selflessly and without human help propel history. Nor can we trust that keeping the planet's ecosystems in order - the core idea of metabolism - will propel history in obvious and effective ways<sup>1</sup>. In his research on *Metabolic urbanization: the making of cyborg cities*, Erik Swyngedouw writes i.a. about how nature becomes urbanized through proliferating socio-metabolic processes. A socio-metabolic process is a set of flows of materials and energy that occur between nature and society<sup>2</sup>. Erik Swyngedouw concludes his research with the following:

*"The socio-naturally "networked" city can be understood as a giant socio-environmental process, perpetually transforming the socio-physical metabolism of nature. Nature and society are in this way combined to form an urban political-ecology, a hybrid, an urban cyborg that combines the powers of nature with those of class, gender, and ethnic relations. ... The recognition of this political meaning of nature is essential if sustainability is to be combined with a just and empowering urban development; an urban development that returns the city and the city's environment to its citizens."<sup>3</sup>*

For the urban development strategy, our species group introduced a notion of circulation by connecting the urban greeneries surrounding the neighbourhood of Blijdorp, Rotterdam. Not only a green connection for the human residents of the city, but also for all other species that inhabit Rotterdam. A hybrid space for humans and nature on a bigger scale, prompting this urban cyborg. But what interests me more is what happens on the smaller scale of this urban strategy, the place of architecture, where we have to design the new housing units for humans. A place where I think that not only the flow of humans but also other species can and will finally reside.



*Notion of circulation, connecting the urban greeneries surrounding the neighbourhood of Blijdorp.  
Made by: species group*

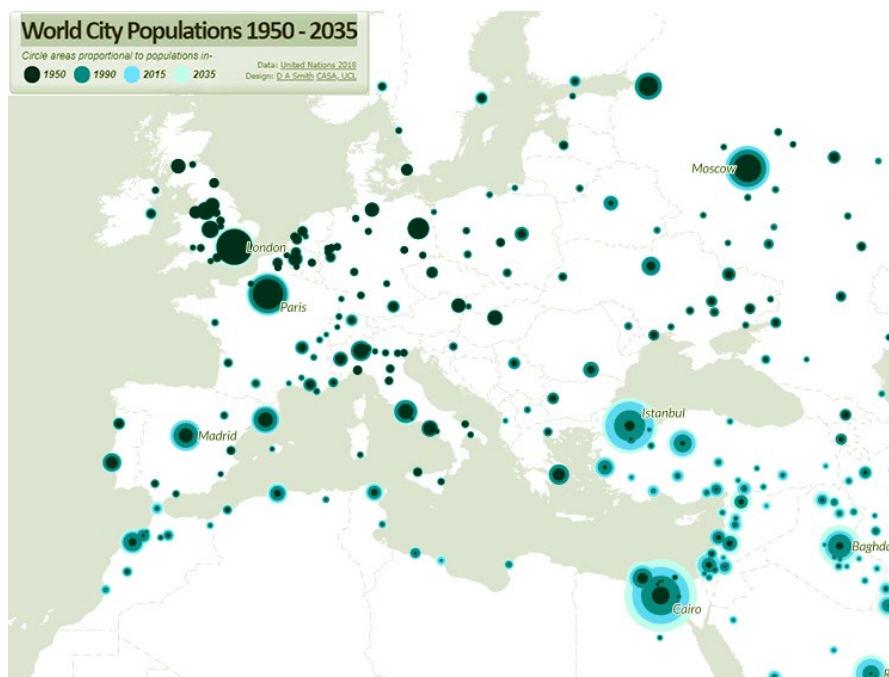
1 Peleman, D., Dehaene, M., & Notteboom, B. (2019). *OASE 104: The Urban Household of Metabolism* (01 ed., Vol. 2019). nai010 Publishers.  
2 Manuel, Toledo, Victor M. (2014). *The Social Metabolism: A Socio-Ecological Theory of Historical Change*. Springer. ISBN 978-3-319-06357-7.  
3 Swyngedouw, E. (2006). *Circulations and metabolisms: (Hybrid) Natures and (Cyborg) cities*. *Science as Culture*, 15(2), 105-121. <https://doi.org/10.1080/09505430600707970>

## Species in the built environment

I'm quite fascinated by the fact that other species inhabit our urban cities and even adapt to it.<sup>1</sup> But one could ask the question if the urban context is a healthy space for them. Less than two km away from Blijdrop, Rotterdam, one can spot foxes in the streets. Due to this the artist Florentijn Hofman made a 5 meter high fox statue in the city of Rotterdam. But there is also a second meaning to it, for the fox is holding a plastic bag in its mouth (talking about a wrong way of adaptation)<sup>2</sup>. The more the cities grow and expand, the less nature we leave. Concerning this the WFUF (World Forum on Urban Forests) made a "call for action" and brought to attention the following:

"For the first time in history, over half of the world's population lives in towns and cities, a proportion projected to reach 68 per cent by 2050. For urban dwellers, our wellbeing and often, our livelihoods, depend on the many services provided by healthy, natural ecosystems in and around our towns and cities. However, as urban areas rapidly expand, land use planning is too often inadequate, failing to take full account of nature's benefits."<sup>3</sup>

This is also important for a country like the Netherlands where there is not so much untouched nature left. Counting to only 26% of the country's surface, that including the inland waterways<sup>4</sup>. This ecology research is not a call to create a green urban utopia, but I believe that we as (future) architects should at least take other species into consideration while designing our urban contexts. Especially when designing housing, because 86% of the registered addresses in Rotterdam have a residential function<sup>5</sup>.



World city populations 1950-2035. Proportional population of cities since 1950.  
Source: <https://luminocity3d.org/WorldCity/#4/46.83/13.45> (data by United Nations 2018)

1 Dell'Amore, C. (2016, 18 april). How Wild Animals Are Hacking Life in the City. *Animals*. <https://www.nationalgeographic.com/animals/article/160418-animals-urban-cities-wildlife-science-coyotes>

2 Klapmuts, A. (2020, 11 juli). *Mysterie opgelost: dit doet de vos met zijn plastic tas op de Schiedamseweg*. *indebuurt Rotterdam*. <https://indebuurt.nl/rotterdam/genieten-van/mysteries/mysterie-opgelost-dit-doet-de-vos-met-zijn-plastic-tas-op-de-schiedamseweg%7E137105/>

3 World Forum on Urban Forests. (2018). *WFUF, greener, healthier, and happier cities for all: A call for action*. <https://www.wfuf2018.com/>

4 Aandeel beschermde natuurgebieden in Nederland | Compendium voor de Leefomgeving. (2010). *Rijksoverheid*. <https://www.clo.nl/indicatoren/nl1425-begrenzing-van-het-natuurnetwerk-en-natura-2000-gebieden>

5 BAG - Kadaster.nl zakelijk. (2021). *Kadaster*. <https://www.kadaster.nl/zakelijk/registraties/basisregistraties/bag>

## Cooperative housing in favour of diversity

Even Though the housing percentages show a high number that doesn't mean there is enough housing for the people of Rotterdam and the Netherlands. In the last few weeks we discovered much about the housing state in the Netherlands during our studio discussions and presentations<sup>1</sup>. Especially the fact that more different household types struggle with finding a home for a reasonable price. Also soon my fellow students and myself will experience this housing market. Due to this I want to broaden my knowledge and find possible solutions for this matter.

To facilitate the hybrid, this urban cyborg, of people and nature, there is a need for a housing system that allows such assimilation. Nowadays there is a housing shortage and the available housing being far too high priced, the chance for housing corporations to even consider financing and incorporating species into the building can be seen as slim. And this is where Cooperative housing comes into play. The more I learn about cooperative housing, the more I see its potential. Cooperative housing organizations think carefully about what they want for their future living environment and aren't reluctant for unconventional architecture<sup>2</sup>. So if the cooperative housing group has an interest in other species it can be possible to incorporate them into the housing design. Another important aspect of cooperative housing is the importance of shared spaces. The rising land prices makes shared spaces more attractive, considering that the financial burden is then shared between the entire housing group. So if there is a possibility for a bigger collective outdoor space, that same space could also be used to house other species.

In their book about the potential of collective housing, *Collective Housing - a new habitat for living in Brussels*(2021), Joren Sansen and Michael Ryckewaert write in the introduction the following<sup>3</sup>:

"This book supports the idea that dense, urban habitats should rely on housing that is truly 'collective'. Or in other words, housing construction should transition from simply producing 'multi-family housing' to 'collective housing'."

After which they later on conclude:

"... In order to answer adequately to the observed diversity in housing needs and preferences, housing production needs to adapt, increasing in its quality and liveability, diversify and democratise towards housing developments that are more demand-centred."

Hence researching the possibility of different and changing household types creating diversity, not only between species but also between the residents. While additionally adding the possibility of reasonably priced houses for a broader demand with possible changing households in the future.

<sup>1</sup> *Group Work of the Urban analysis. (2021) AR3AD100 Advanced Housing. Ecology of inclusion. chapter: Political economy*

<sup>2</sup> *Kockelkorn, A., & Schindler, S. (2020). Cooperative conditions. A primer on Architecture, Finance and Regulation in Zurich.*

<sup>3</sup> *Sansen, J., & Ryckewaert, M. (2021). Collective Housing. A New Habitat for Living in Brussels. VUBPRESS. introduction p. 9 & Conclusions on collective housing projects p. 115*

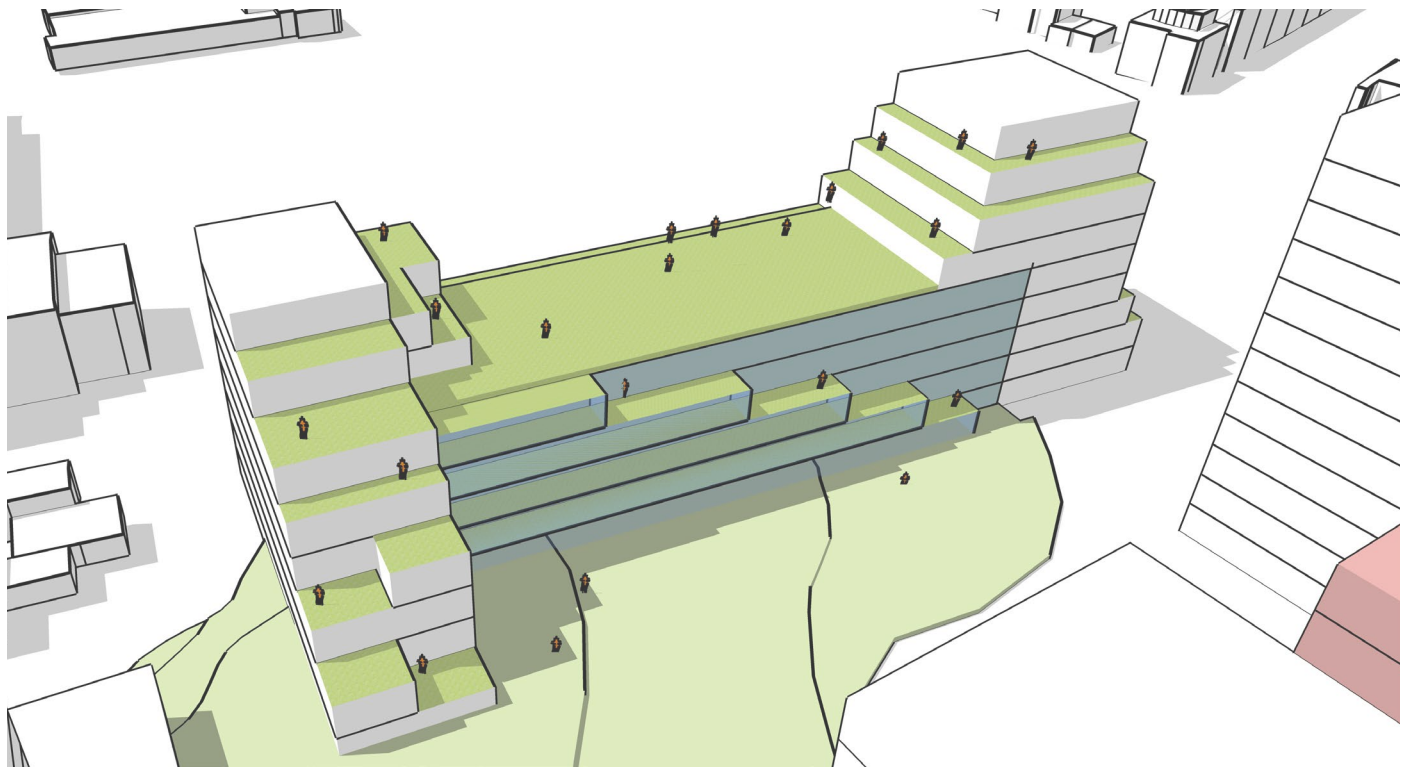
## The problem statement of interspecies housing

When combining the different household types with the different species one might think of all of the positive aspects it could add to housing units. But then again, every positive value has its price in negative terms, is a saying I always keep in mind. The same goes for interspecies housing. I also think about the problems that could unravel. Wanting to prevent possible friction and conflicts and wanting to know when to connect or disconnect these different households and species. So due to this the next research question will be the leading theme in this research:

**What is the fine line of cohesion between different species and different people in a cooperative housing project (in Rotterdam, Blijdorp), to keep it functional/livable and physically appealing through architectural interventions?**

sub-questions:

- What possible needs and desires are there for the users on a private and communal level?
- What are the possible places where the different users could run into each other?
- What architectural interventions can be used to organize and influence the way of cohesion between the users?



*artist impression of the individual plot choice*

Source: own work

## Hypothesis

With the ever-expanding urban fabric of our cities, leaving less and less untouched nature, makes the incorporation of nature an important aspect. Arguing the importance of an Urban Cyborg, created through urban development and in this case the new built environment on the given sites in Blijdorp. To realise this model I want to argue the importance of cohesion between the species on the building scale, while also understanding and knowing how to implement this particular fine line. In such a way that this cohesion won't have a negative effect, on either the households as the species themselves.

It is not only important to distinguish the different needs and desires of the users but the key factor is how to implement it through the use of architecture. Knowing at which places in or around the building these users could possibly reside. Due to this my main field of analysis will be the threshold between the outdoor and indoor spaces. In other words, the vicinity of the front, back, side and roof facades.

The incorporation of a cooperative housing system with diverging households, shared spaces and a place for nature is a step into returning the city and its environment to it's citizens. Even if it is still a small step, on the used scale of one building unit.



# 2. RESEARCH FRAMEWORK

## User groups

### The human group:

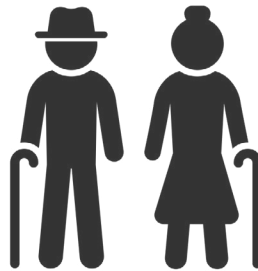
In order to be able to carry out the urban plan and guarantee its qualities, it was decided to demolish a large part of the existing buildings. As a result, the existing residents of the area have to abandon their homes. A great number of these existing household types are elderly people from the elderly home and students from the student housing. I believe it's only fair to try to incorporate as many of them as possible into the new housing design, while also making sure the new dwellings are at least as good as the existing.

To enhance diversity of households but moreover bolster the housing market, a third household type will be added. This household type will be the family household. This results into three contrasting types of households not only because of the sizes of the dwellings and users, but also due to the differing time of occupancy. The different students can change yearly, the families would occupy the dwellings for a longer period, while for the elderly it is tough to say.



**Students:**

For this research the student households will consist of smaller private dwellings with a shared living area.



**Elderly:**

The elderly can consist of one or two person households and have bigger dwellings than students but smaller than the family household.



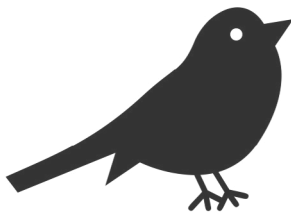
**Families:**

The added family household types will have the biggest dwelling units and consist of two parents and one or two children.

## The species group:

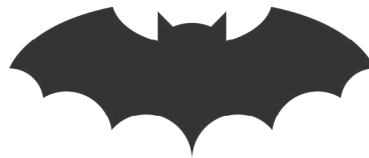
As architects we can hardly control users to utilize architecture precisely the same way as the architect has intended to. This will probably be even more the case when trying to design for and incorporate species. Nonetheless a selection of species has been made based on their presence in the city of Rotterdam, important role in nature and/or a need to help them thrive in the Urban Cyborg.

The chosen species are the small Coal tit bird, the Pipistrelle bat and the honey bee. These tree species can have a positive effect, a symbiosis, with the green corridor of the urban Masterplan. The Bees ensure the pollination of the different fauna in the area, while the bats and coal tits can feed off the insects living there.



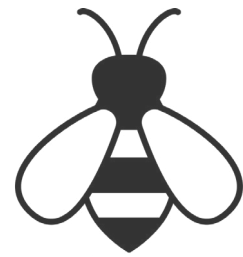
**Coal tit:**

Different Belgian institutions (KU Leuven, UCL, UGent, UA, KBIN) conclude that the Coal tits are able to adapt to the urban city, but their chances of reproduction is still lower than in a natural environment. A few problems are the lack of nutritions and the urban city being too noisy<sup>1</sup>.



**Pipistrelle bat:**

Bats are a common animal species in the Dutch urban environment. For example, they hide in attics, sheds and behind facades. Although these spots are gradually disappearing due to the construction of new buildings<sup>1</sup>.



**Honey bee:**

The developments in Dutch agriculture have had an effect on the supply of wild plants in the Netherlands and neighboring countries. As a result, the honey bees do better in the city than in the countryside. And on top of that they have a positive effect on biodiversity<sup>1</sup>.

<sup>1</sup> SiteWise Webmedia B.V. Nijmegen. (2018). *Koolmezen in de stad passen zich aan, maar doen het minder goed*. NWST., from: <https://www.stad-en-groen.nl/article/27282/koolmezen-in-de-stad-passen-zich-aan-maar-doen-het-minder-goed>

<sup>1</sup> Ongedierte, M. (2019). *Vleermuizen - Meldpunt Ongedierte*. <https://www.meldpuntongedierte.nl/plaagdierengids/vleermuizen>

<sup>1</sup> Molenaar, J. (2021). *Bijen in de stad*. Bijenstichting. <https://bijenstichting.nl/bijen-in-de-stad/>

## Methodology and Methods

Sub question 1:

### **Understanding the users**

Before diving into the architectural aspects of this research, I argue that a general understanding of the needs and desires of the user groups is required when it comes to the thresholds between the outdoor and indoor spaces. Especially the needs and desires of the species group, for I have no professional knowledge for that aspect. To narrow my field of research I use the lessons of Patrick Geddes (1854-1932). Even a century after his publications can be of use for he emphasized the relevance of a man-nature relationship for the survival of the species<sup>1</sup>.

Epistemes: Praxeology & Zoology and Ecology:

Sub question 2:

### **Mapping the users**

When a basic understanding of the user groups is formed, a spatial elaboration can be set up. To know when and where possible interactions could arise at the different thresholds. Combining this knowledge and the analyses of the different case studies should aid in finding the optimum spatial division in the design. Casually transitioning from the theoretical aspects into the architectural practices.

Epistemes: Praxeology, Mapping spatial interspecies practises

Sub question 3:

### **Architectural interventions**

Now that the theory and, in general, the practical application has become clear, it is possible to move on to the possible technical aspects and elaborations. Also hereby adding the information from the case studies to have the possibility to draw conclusions and answer the research question. So that this newly acquired knowledge can be incorporated into the graduation design.

Epistemes: Morphological and Material culture

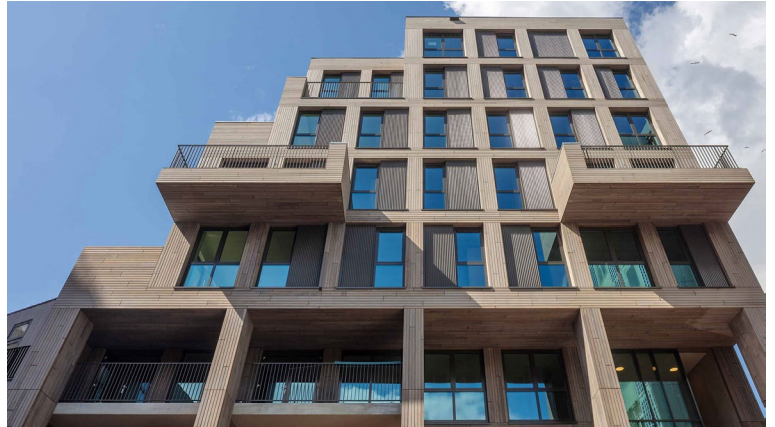
<sup>1</sup> Hebbert, M. (1990). Meller, Helen, Patrick Geddes: Social Evolutionist and City Planner (Book Review). *Town Planning Review*, 61(3), 368. <https://doi.org/10.3828/tpr.61.3.x101678530565285>

## Case studies

The chosen case studies should already be built or almost finished. I don't want to use conceptual/future projects, so that the research can be more demonstrable. The case studies are continually an integral part of the research after most of sub-question 1 has been set up. The analyzed architectural elements and solutions should enhance interspecies cohesion.

### Hooghout CPO

Architects: ANA Architects  
Location: Amsterdam, Netherlands  
Year planned: 2016  
Year built: 2021  
Program: 20 dwellings  
Building typology: Stepped blocks  
Client: Bouwgroep Het Hooghout



Reasons to research:

- Different households with different wishes for their dwellings.
- Built sustainably.
- Possibility to contact/interview different parties involved in the project.
- Collective housing project.

source information and picture: <https://www.ana.nl/portfolio-item/het-hooghout/>

### Thalmatt 1

Architects: Atelier 5  
Location: Herrenschwanden, Switzerland  
Year planned: 1967  
Year built: 1974  
Program: 18 dwellings  
Building typology: Stepped blocks/groundscraper  
Client: Private Cooperative



Reasons to research:

- Build into a slope.
- Despite the structure, the houses are very diverse and spatially designed.
- Surrounded by greenery and added greenery on the terraces.
- Collective housing project.

source information and picture: DASH: Building Together: The Architecture of Collective Private Commissions (2013-12-31). (2021). nai010 publishers.

## Cite du Grand Parc

Architects: Christophe Hutin architecture,  
Frederic Druot, Lacaton & Vassal  
Location: Bordeaux, France  
Year built: 1960's  
Year restoration: 2016  
program: 530 dwellings  
Building typology: Slab building  
Client: Housing corporation



Reasons to research:

- Social housing, same as the used building on my plot.
- Renovation proved more cost efficient. Potential to infest in species housing.
- Enlargement of existing spaces.
- Possible species incorporation with the new double facade.

source information and picture: <https://www.archdaily.com/915431/transformation-of-530-dwellings-lacaton-and-vassal-plus-frederic-druot-plus-christophe-hutin-architecture>

## Jeanne Hachette

Architect: Jean Renaudie  
Location: Ivry-Sur-Seine, France  
Year planned: 1969  
Year built: 1975  
program: large commercial center, 40 apartments  
Building typology: Stepped blocks  
Client: Housing corporation



Reasons to research:

- Terraces filled with sloping greenery.
- Different types of apartments.
- Public connection between public street and upper levels.

source information and picture: <https://biennalewiki.org/?p=864>

Extra:

- Trudo Vertical Forest, Eindhoven. Design: Stefano Boeri Architects
- Superlofts, Amsterdam. Design: Marc Koehler
- Windsong Cohousing, Langley Canada. Design DWS architecture

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# Research diagram



Start here

## Familiarizing with the concept of Cooperative Housing

- Lectures
- Preliminary readings
- Obtained books about Co-op housing

Personal interests

## Choosing topics

Ecology topic: **Cohabitation**  
 Inclusion topic: **Diversity**

### Conceptual notions

- Urban Metabolism
- Urban Cyborg
- Hybrid Space

## Problem statement

User group

## Research question

sub question 1

sub question 2

sub question 3



checkpoint P1

## Needs and Desires

sub-question 1  
 acquire knowledge

### Needed literature

Species	Household	Co-op housing	
~~~~~	~~~~~	~~~~~	1st Draft
~~~~~	~~~~~	~~~~~	2nd Draft
~~~~~	~~~~~	~~~~~	P1
~~~~~	~~~~~	~~~~~	P2 - adding missing info if needed

acquire knowhow

Case studies are continually a integral part of the research

### Case studies

Hooghout CPO Amsterdam

Thalmatt 1 Herrenschwanden

Cite du Grand Parc Bordeaux

Jeanne Hachette Ivry-Sur-Seine

Architectural elements and solutions to enhance interspecies cohesion

## sub-question 2 Mapping

acquire knowhow

check check double check

acquire knowhow

## sub-question 3 Possible Architectural Interventions

But not done yet

Ability to detect the fine line in a cohesive housing design for different species

Finish here

# DESIGN PROPOSAL

# CONCLUSION

## Graphic novel storyboard

For the graphic novel I want to illustrate the usage of interspecies collective housing throughout the day. Where one can see the clear separation of each user's "household". A continued usage of the building at day and night, due to the species' different agendas. While every species keeps its own place inside/around the building, their spot should be available for change and renovation. The novel should illustrate how the species population grows over time, while the household types could change.

### Alive building in the Cyborg city

