CP 10
Body, Building, Berlin
Complex Project

DE-AGING EDEN

ELDERLY SCHOOL

Design Brief in P2
Junran Zhao_5745675

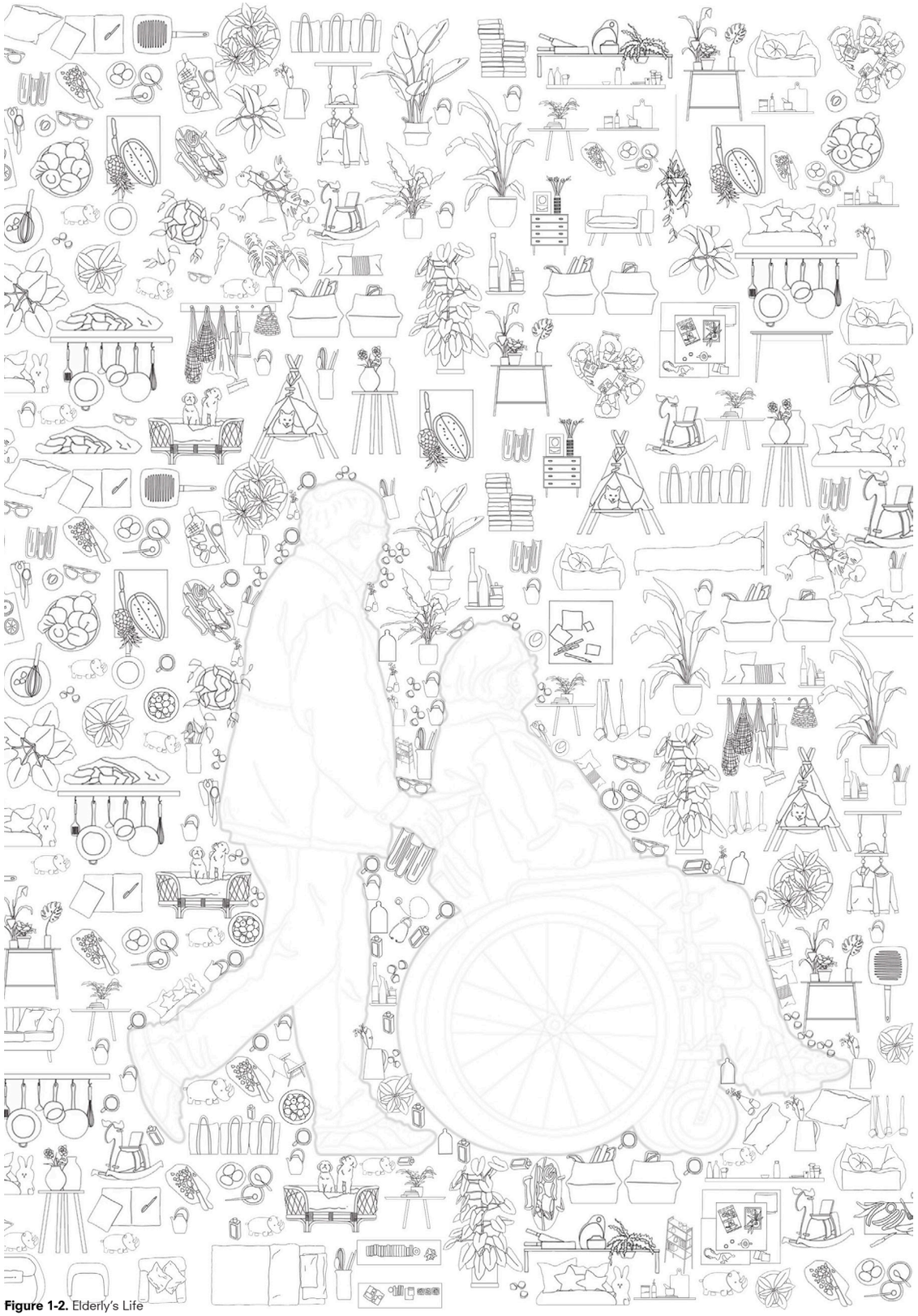


Figure 1-2. Elderly's Life

INDEX

01 INTRO 010

Thesis Topic
Problem Statement
Research Question

02 RESEARCH FRAMEWORK 016

Theoretical Framework
Relevance

03 RESEARCH METHODS 020

Client
Program
Site

04 DESIGN BRIEF 026

Client
Program
Site

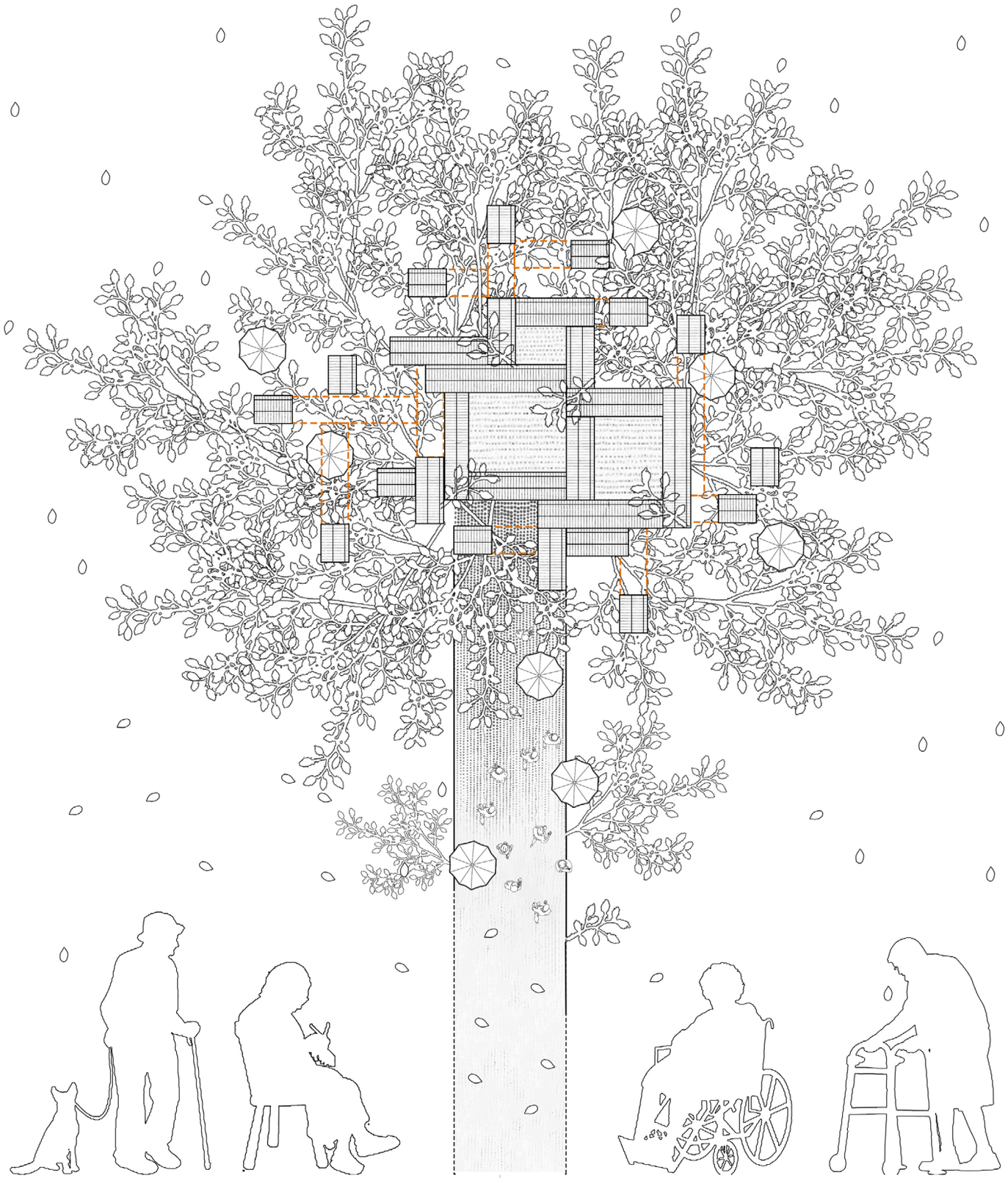


Figure 3. What elderly school could do

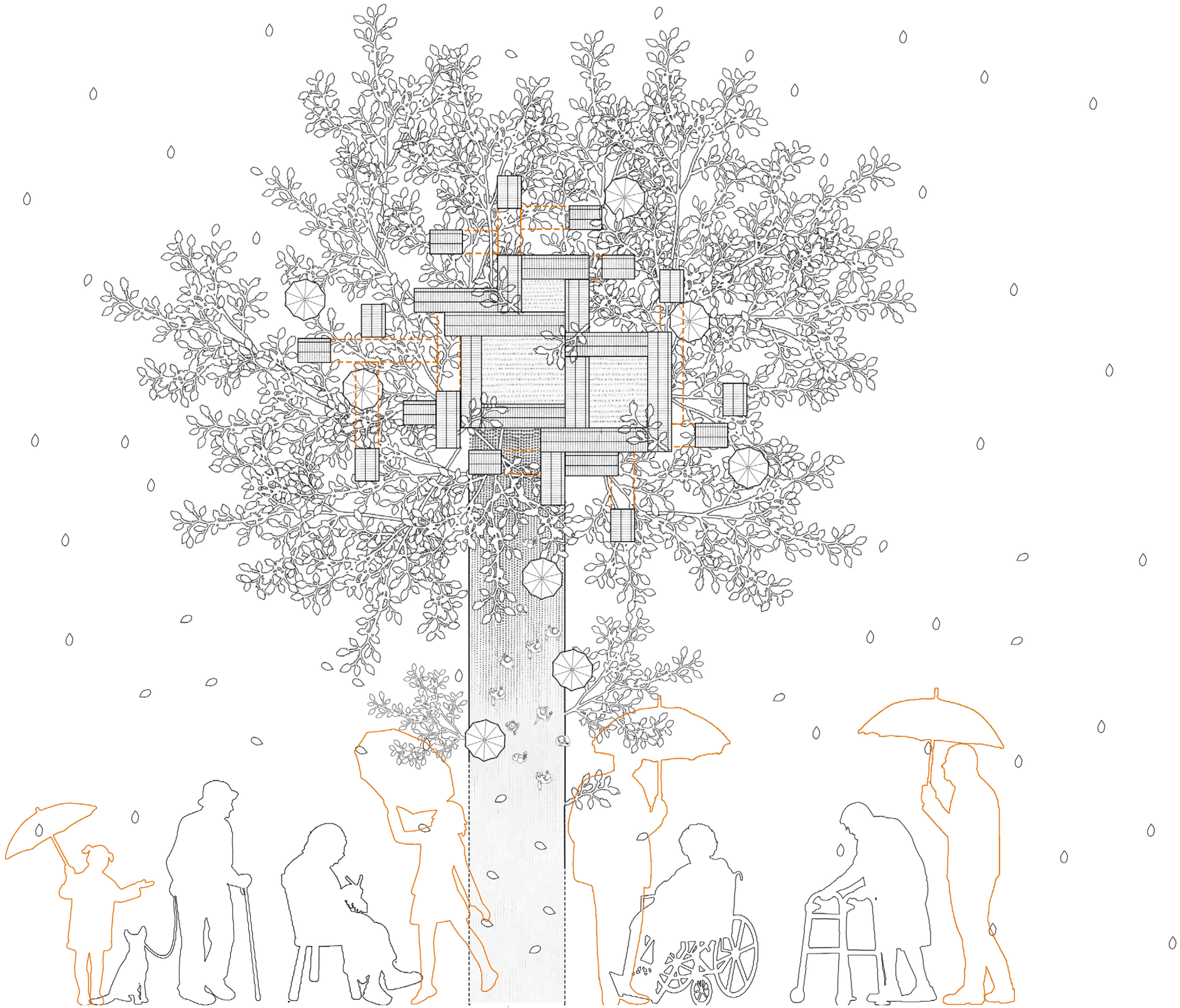


Figure 4. What elderly school could do

INTRODUCTION

01

1.1 Thesis Topic

Buildings used for educational purposes occupy an important place in contemporary society. The Oxford Dictionary's first definition of the word "school" is "an institution for educating children" (School_1 Noun - Definition, pictures, pronunciation and usage notes | Oxford Advanced Learner's Dictionary at OxfordLearnersDictionaries.com, z.d.), which is strongly age-specific. When people talk about the building type of school, it is the school for children and young people that occupies the center of attention. Schools for other age groups, especially the elderly, receive less attention overall.

Currently, existing schools for the elderly are places where the elderly can dissipate their loneliness through interest classes. The elderly gather together to participate in various activities and physical exercises, fostering and promoting social-interest interaction among the elderly community.

This type, which is currently not in the limelight, is becoming particularly important in the context of the aging trend because of its special type. Berlin is currently facing a serious aging problem, and there will be more and more elderly people in the future (Schwär, 2019). Focusing on the care needed by the elderly has become an important topic. In the McKinsey survey on factors influencing life expectancy, "having purposes in life" is at the top of the list (Ahlawat, H., Darcovich, A., Dewhurst, M., Feehan, E., Hediger, V., & Maud, M., 2023). Meanwhile, the emerging model of "older and younger people living together" is becoming more and more popular as an elderly healthcare option in Germany (遇见老年人, z.d.). Cross-age communication allows the elderly to regain the "feeling of being needed" when they were young and to realize a sense of self-actualization.

The philosopher Mencius wrote in *Liang Hui Wang I*, "Honor old people as we do our own aged parents, and care for other's children as our own" (Shun, 1997). This research and design is not only a new space for the elderly but also a discussion on how to provide them with a more desirable and comfortable elderly life.

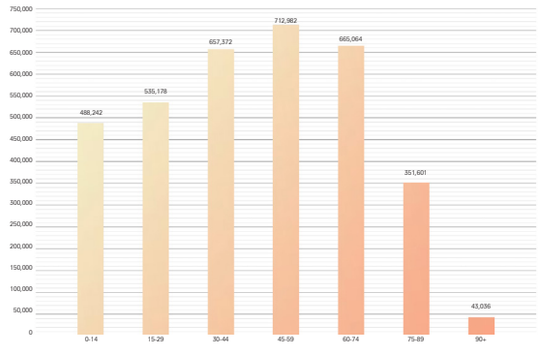


Figure 5. Berlin Population Data, 2023

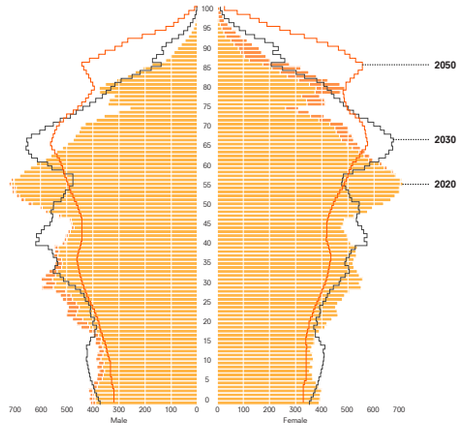


Figure 6. German population development, 2020, 2030 and 2050

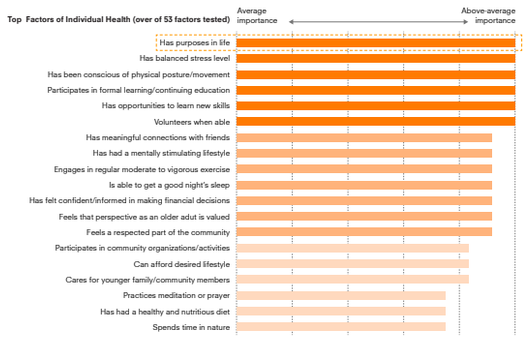


Figure 7. Top Factors of Individual Health

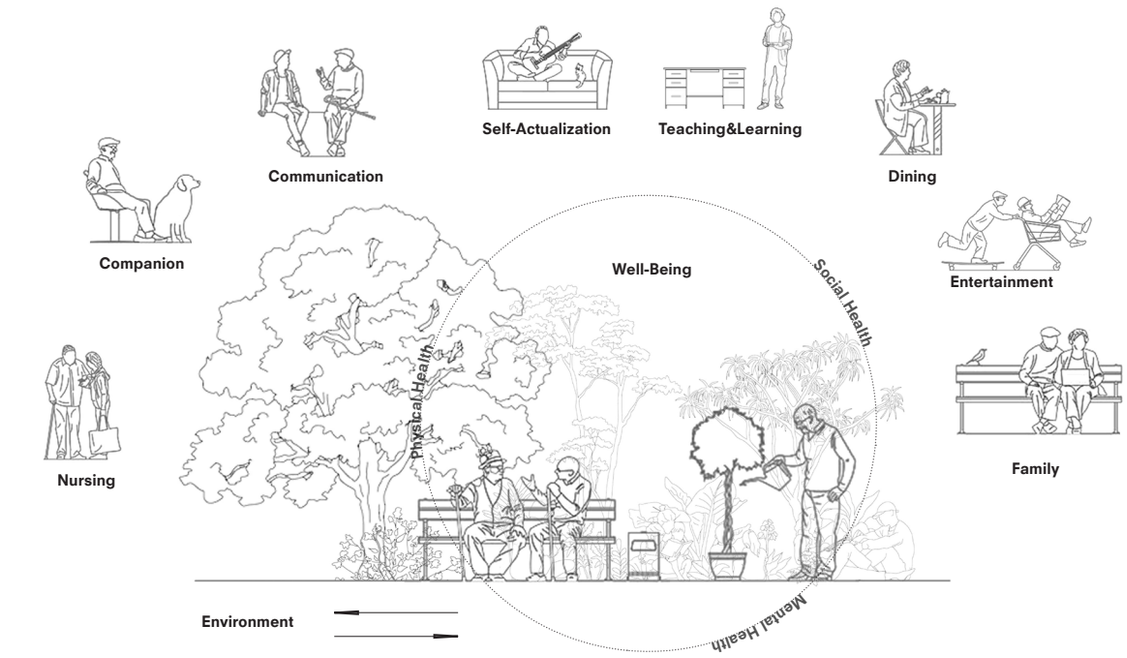


Figure 8. Ideal Elderly School

1.2 Problem Statement

In the present era of information advancement, education and learning extend beyond the process of transitioning from primary school to university (Ahmed, 2014). It demands that every qualified citizen engages in continuous learning to stay abreast of the times. Therefore, elderly education is an essential component of societal adaptation for the elderly. For example, new media unfamiliar to the elderly is often one aspect through which they gradually become disconnected from the world, something that is familiar to younger generations. For young people, life skills and societal norms are lessons they must learn to integrate into society, which are also the result of the life experiences gained by the elderly over many years of work and life. Intergenerational knowledge exchange can help people of different ages acquire the knowledge they need, allowing older people to better integrate into their social environment in this process of helping each other.

In Germany, approximately 5.9 million people aged 65 or older live alone, accounting for one-third (34%) of the population in this age group (Nearly 6 million older people live alone, z.d.). Loneliness is considered one of the culprits of elderly depression. Self-actualization contributes to stable mental health in the elderly, effectively reducing the probability of depression. In Maslow's *A Theory of Human Motivation*, self-actualization is situated at the highest level, representing the realization of one's potential and self-fulfillment (Maslow, 1943). During the process of intergenerational knowledge exchange, the elderly can experience two types of self-actualization: first, the satisfaction of imparting their life experiences and expertise to others, and second, the affirmation of themselves by learning new things and thereby improving their quality of life.

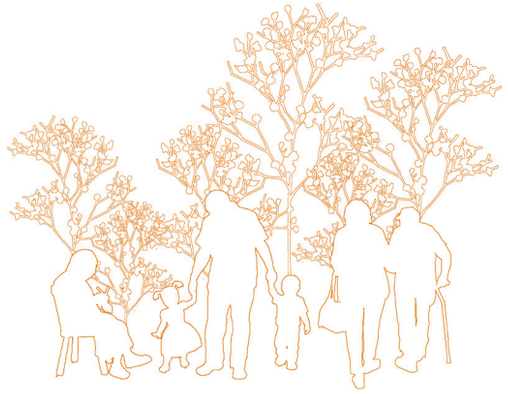


Figure 9. Intergenerational Communication

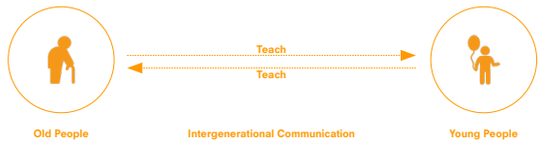


Figure 10. Intergenerational Knowledge Sharing

Figure 11. Maslow's hierarchy of needs

1.3 Research Question

This study serves the design of an elderly school located in Berlin, and its distinctive feature lies in exploring the connection between the process of intergenerational knowledge exchange and self-actualization in the elderly. Whether this connection can be directly condensed into a specific architectural space is the most intriguing aspect of the research. Therefore, this research needs to answer the question:

Can intergenerational knowledge-sharing space help the elderly achieve self-actualization?

Given the current situation, intergenerational knowledge exchange in a non-fixed state has already proven effective, fulfilling the psychological aspect of self-actualization for the elderly. For them, communication can occur anywhere without the need for a specific space.

Of course, the ambition as designers also hopes for an idealistic possibility — that is, an unprecedented space specifically designed for intergenerational exchange. Such a space would significantly enhance the efficiency and intensity of self-actualization for the elderly through these activities, becoming a incubator for the future happiness of the elderly.

Figure 12. Collage for Research Question

RESEARCH FRAMEWORK

02

2.1 Theoretical Framework

In this study, the methodologies of design psychology, multisensory interaction, and participatory design progress layer by layer, forming a theoretical framework that encompasses spatial foundations, spatial endowments, and spatial behaviors.

Design Psychology

As the effectiveness of design lies in its impact on people, attention to user reactions and experiences is crucial in the design process, leading to a demand for design psychology. All design is intricately tied to emotional origins, with the user's emotions and feelings closely linked to the visual and perceptual aspects of design. Specifically, fundamental factors such as the scale, shape, material, brightness, and color of a space need to be considered for the roles they play in user experience. Don Norman, in *The Design of Everyday Things*, points out that design should be guided by the principle of ease of use, and that design with emotional care will increase user satisfaction (Norman, 1988). Naoto Fukasawa, in his book *Naoto Fukasawa*, responds to this by refining the concept of "affordance," studying user behavior and invoking users' memories and emotions (深澤, 2018). Behind every unconscious behavior is the resonance of emotions between designers and users.

Participatory Design

Participatory design originated in Scandinavia in the 1960s, initially aiming to include the public's voice in making decisions about policies (û Ï ĵ ơ û ơ - -, z.d.). Through the practice of applied anthropologists and practitioners in the field of user experience, this methodology has been extended to the design field, including software development, architectural design, urban planning, and so on. Participatory design strengthens the integration of design and experience, with users immersively engaging in space design and continuously contributing to the space. This process facilitates the ongoing self-upgrading and iteration of the space. It reinforces the importance and initiative of the user, upgrading "user-centered design" to "user-participatory design".

Multisensory Interaction

Pallasmaa, in the book *The Eyes of the Skin*, mentions that vision is not the sole sensory mode for human perception of the world (Pallasmaa, 1996). Hearing, touch, smell, taste, and other senses also play crucial roles in people's attempts to comprehend the world. Multisensory interaction creates immersive experiences, and with each added layer of sensory input, the stimulation of human cognition and memory becomes more vivid and profound. When an environment simultaneously engages multiple sensory modalities at the same time, people's experiences and impressions of things and surroundings become more intense. A space that can activate a variety of senses as much as possible is better suited to meet the requirements of future living environments for a fulfilling life.

2.2 Relevance

The goal of this research and design is to apply the theoretical framework of the three aspects mentioned above in the intergenerational knowledge exchange space of the elderly school. Firstly, at the foundational level of spatial design, it aims to meet the psychological and habitual needs of the elderly and other age groups, maintaining a soft character of the space, and fostering a desire for communication between different age groups and the elderly. Simultaneously, it seeks to evoke multiple sensory experiences for the elderly within the space, organizing different types of activities to create complex layered experiences, such as combining music education with gardening spaces, and cooking classes with psychological counseling.

Elderly participation in space is divided into two tendencies: one is the traditional additive space, where the achievements of the elderly in teaching and labor serve as decorations and spatial elements, reflecting a tangible and visual sense of accomplishment. The other is the postmodern participatory space, emphasizing the interaction between architectural technology media and the elderly, enhancing the joy and satisfaction of the elderly in enjoying new technologies after acquiring them. Such attempts will inspire the exploration of new forms and models for educational spaces, including intergenerational knowledge exchange spaces.

Figure 13. Without-Thought Design, B&B Italia by Naoto Fukasawa

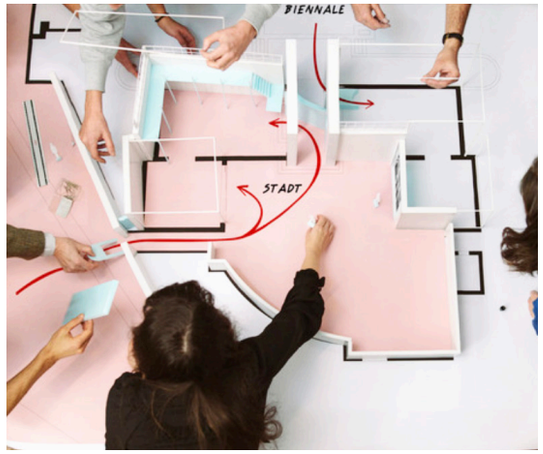


Figure 14. Participatory Design, Austria Pavilion at Venice Biennale 2023

Figure 15. Multi-sensory Installation by Fabrica

RESEARCH METHODS

03

3.1 Client

The main target demographic of the intergenerational knowledge sharing space is the elderly population living in Berlin. Therefore, understanding relevant information about the elderly in Berlin is a necessary step in researching this demographic. Browsing healthcare-related websites and literature, using data-driven approaches to understand the age distribution, issues, and future trends of aging in Berlin, as well as the health conditions and disease distribution proportions among the elderly. Additionally, through researching and comparing different elderly care models in Berlin, summarizing standards for evaluating care models and the developmental trends of age-appropriate functionalities in the future. The aim is to explore current issues and shortcomings in the elderly care system and identify the genuine needs of the elderly. At the micro level of individual difference, this stage also involves investigating the interests and learning needs of the elderly, allowing for a better understanding of how to leverage their strengths in the elderly school and facilitate intergenerational knowledge exchange with a sense of self-actualization.

3.2 Program

The functional ratios and spatial structures of existing buildings of school can be obtained by using the method of case studies. As a forward-looking elderly school with intergenerational communication at its core, it is essential to analyze the functional composition and spatial proportions of existing elderly schools, elderly daycare centers, and schools for different age groups. This analysis helps to better understand age-appropriate architectural spaces and the spatial needs of different age groups. Additionally, the development trends and core spatial proportions of intergenerational communication senior school projects can be grasped through the comparison of various case studies.

Furthermore, understanding spatial arrangements can be deduced from observing crowd behavior. By extensively reading school case studies, analyzing the spatial needs of different age groups, and summarizing the spatial highlights of excellent cases, possibilities for promoting intergenerational communication spaces can be discovered, and a comprehensive spatial structure for the senior school can be organized.

Field investigations and interviews with outstanding real-life elderly care projects, enabling face-to-face communication with the elderly and service people, contribute to on-site understanding of the interests, lifestyle patterns, and needs of the elderly.

3.3 Site

During the initial site selection process, the method of mapping was employed based on factors such as the concentration of elderly and young populations, natural environmental resources, community safety conditions, urban soundscapes, etc. This approach helped filter out age-mixed areas that are conducive to living. Subsequently, a quantitative comparison was made regarding the socio-economic conditions, healthcare facilities, social development, and other aspects of the candidate sites to determine the final selection.

Following the site selection, literature research was conducted to understand the historical context and future plans for the chosen site. In the final stage, an in-depth field investigation was carried out, combining sensory awareness with multidimensional scientific recording to comprehend the actual state of the site's spatial characteristics. Detailed data collection involved studying the activities of the people on the site, the distribution of different types of spaces, the functioning of social activities, and other potential on-site design resources.

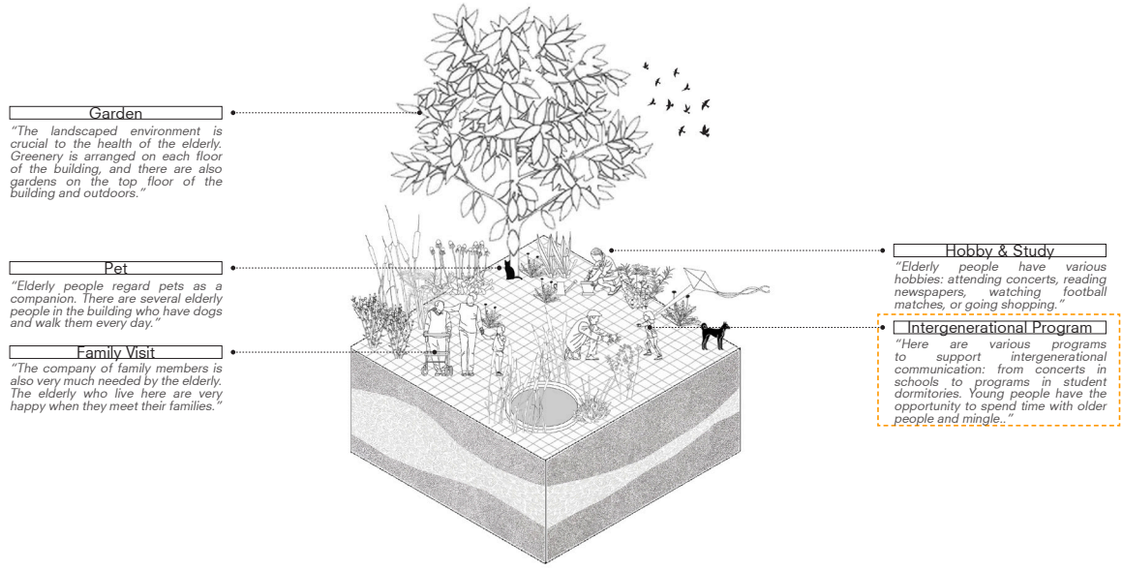


Figure 16. Interview of Field Trip in Tertianum Residenz, Berlin

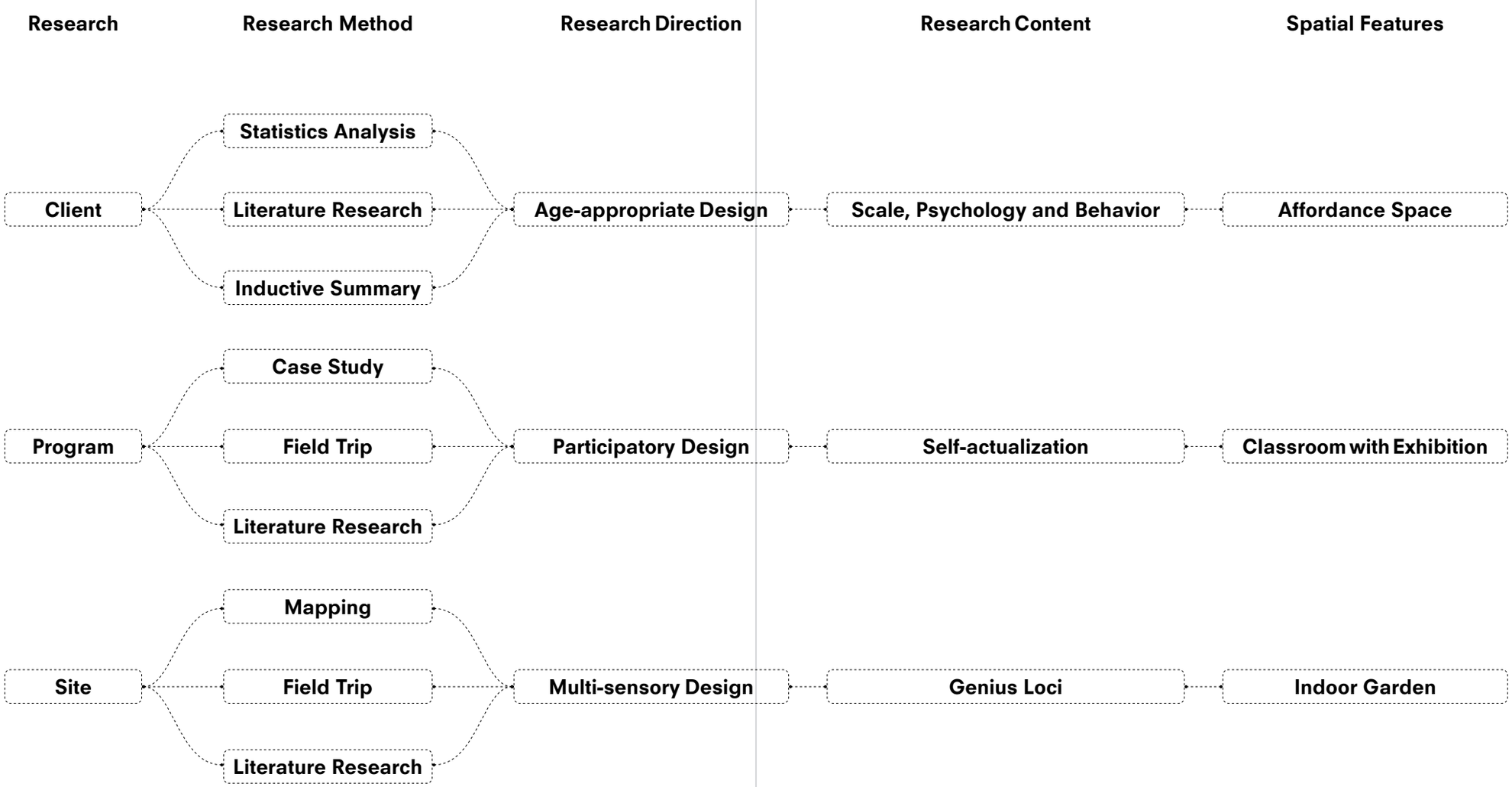


Figure 17. Research Process

DESIGN BRIEF

04

4.1 Client

Project clients are departments and agencies dedicated to providing better social services to the elderly, including federal departments and pension insurance and medical institutions. According to the design purpose, unquestionably, the primary user is the elderly population in the targeted design area. Through data surveys, it has been revealed that Berlin is currently facing a severe aging issue, with over half of the population expected to be elderly by 2030 (Schwär, 2019). There are currently four types of elderly care models in Berlin: home care for the elderly, residential care for the elderly, institutionalized care for the elderly, and elderly living with younger people. Presently, approximately 66.7% of the elderly opt for home care, allowing them to reside in familiar surroundings and choose to participate in activities at daycare centers during the day (遇见老年人, z.d.).

However, emerging age-mixed living models are increasingly gaining popularity among the elderly. This is because older individuals can acquire new information through interactions with younger people and leverage their life experiences to assist the younger generation in addressing work and life challenges. Among various elderly care keywords, intergenerational communication is what brings the most self-fulfillment and joy to the elderly. The various hobbies and needs of the elderly can be transformed into different courses, serving as a medium for intergenerational knowledge exchange. Consequently, the building will also simultaneously meet the usage needs of the non-elderly population participating in intergenerational communication, as they are also users of this building.

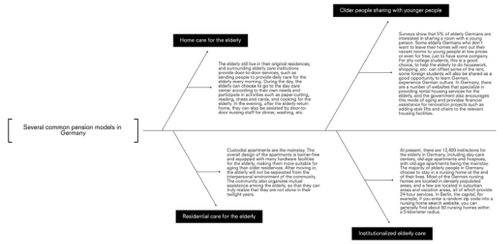


Figure 18. The German Model of Elderly Care

HEALTHCARE MODEL FOR THE ELDERLY	Home Care for the Elderly	Residential Care for the Elderly	Elderly Co-Living with Younger People	Institutionalized Elder Care
Living in a Familiar Environment	+++	-	++	-
Living with Friends	+++	+++	+	-
Hobby	++	++	+	+
Learning New Things	+	+	+++	+
Mixed-Age	-	-	+++	-
Elderly-Friendly Environment	-	+++	-	+++
Nursing	+++	++	+	+++
Professional Medical Treatment	+	+	-	+++
Money-Consuming	+	++	-	+++
Intelligent Healthcare	-	-	-	-
Sense of Self-Actualization	+	+	++	-

Figure 19. Comparison between Elderly Care

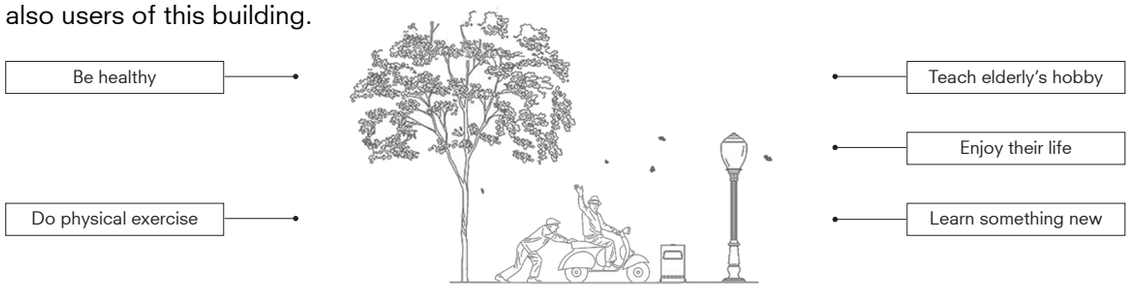


Figure 20. What Elderly Can Do in This School

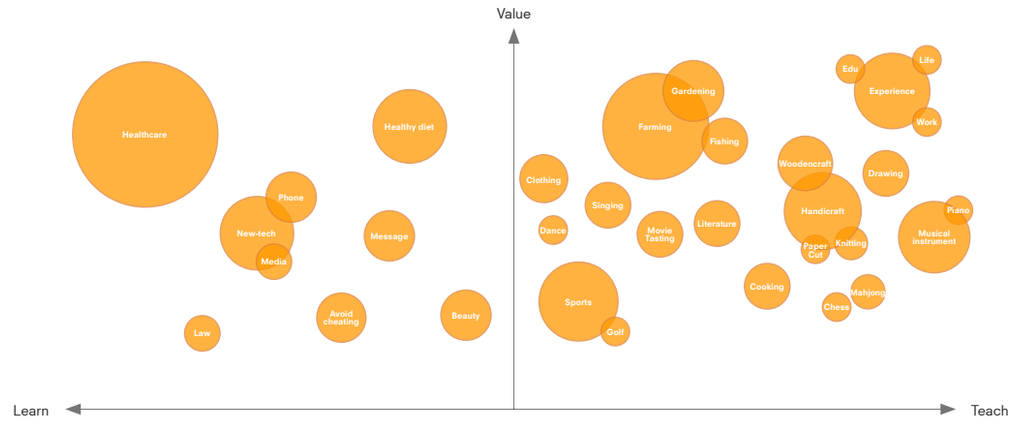


Figure 21. Elderly Interests and what they need to learn

Space	Function	Class	Old People		Young People		Value
			T	S	T	S	"Have purpose in life"
Outdoor Area	Sensory Garden	Gardening Class	●	●	○	●	Prevent cognitive impairment
		Music/Dance Class	●	●	●	●	Interact with mixed-age people
		Fishing Class	●	●	○	●	Balance stress level
	Healthcare Farm	Farming Class	●	○	○	●	Provide physical exercise
Indoor Area	Workshop	Handicraft Class	●	●	●	●	Share hobbies
		Woodencraft Class	●	○	○	●	Interact with mixed-age people
		Knitting Class	●	○	○	●	Prevent cognitive impairment
	Gym	Sports Class	●	●	●	●	Provide physical exercise
		Yoga Class	●	●	●	○	Meditate
	Dining Hall	Cooking Class	●	○	○	●	Interact with mixed-age people
		Healthy-diet Class	○	●	●	●	Have health quality of diet
	Classroom	Drawing Class	●	○	○	●	Balance stress level
		Literature Class	●	○	○	●	Share knowledge
		Health Knowledge Class	○	●	●	●	Gain knowledge of healthcare
		New-media Class	○	●	●	○	Learn something new
		Parenting Class	●	○	○	●	Share educating experience
	Café	Life-experience Sharing	●	○	○	●	Share living experience
	Healthcare Center	Physical examination	○	○	○	○	Ensure a healthy body

Figure 22. Planned Schedule of Elderly School Based on the Interests

Figure 23. Age-appropriate Design

4.2 Program

The study incorporates an analysis of various facilities in Berlin, including an advanced elderly care institution (Tertianum Residenz Berlin) with progressive aging concepts and architectural environments, two existing elderly school cases (Fengxian Senior-Citizen University, Guangxi Senior School), three community-based elderly daycare centers (Engawa Senior Daycare Center, de Julio Senior Day Center, La Vorada Center for Seniors), and establishments catering to different age groups such as kindergartens (Jacques Chirac School), middle schools (Anne Frank Middle School), and an art university (Kuwasawa Design School). The analysis aims to draw conclusions regarding the distribution of functions:

1. Intergenerational classrooms, landscape and sports hall are three important spatial elements in the design of an elderly school.
2. Improving the landscape capacity in the elderly school is necessary.
3. Elderly school should have a higher proportion of athletic space than schools serving other age groups.
4. Elderly people have limited mobility, so buildings suitable for the elderly should have as few floors as possible. If the building has more floor amount, a higher proportion of traffic space is required.

The ambition of the elderly school project is to better serve the elderly and enhance their life experiences. Accordingly, the strategy for adjusting project types and areas includes the following:
1. Circulation: Increase the width of walkways and the area of staircases and elevators.
2. Canteen: As a space for communication among the elderly and other age groups, expand the area for public services.
3. Teaching Content: Increase course arrangements for intergenerational knowledge exchange.
4. Sports: Arrange more soothing exercises to reduce the possibility of injuries caused by strenuous exercise to the elderly.
5. Landscape: Provide an indoor garden where the elderly can walk, engage in conversations, and socialize throughout all four seasons.

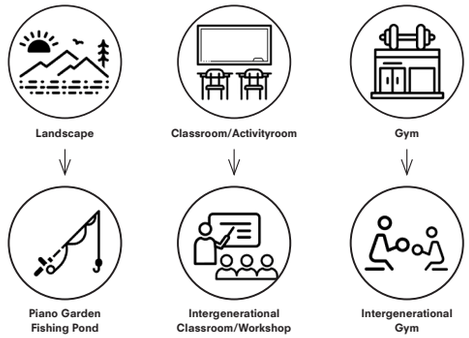


Figure 24.1 Conclusion Diagram 1

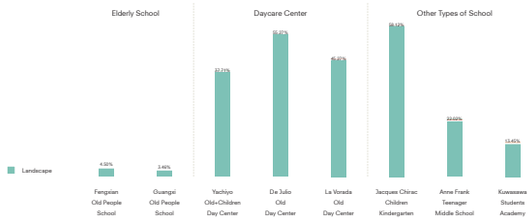


Figure 24.2 Conclusion Diagram 2

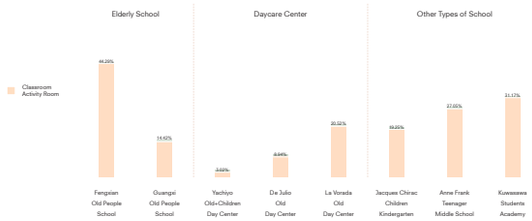


Figure 24.3 Conclusion Diagram 3

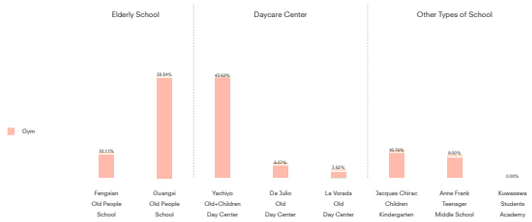


Figure 24.4 Conclusion Diagram 4

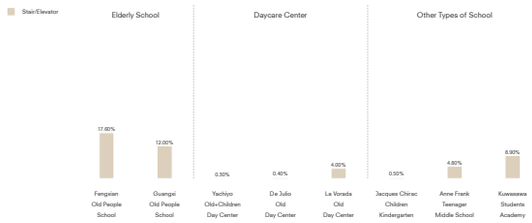


Figure 24.5 Conclusion Diagram 5

6. Medical care: Increase medical facilities to prevent sudden illnesses among the elderly.

According to the functional composition and intergenerational knowledge exchange space in the above case, the functional space distribution and area proportions of the senior school are as follows: activity area (2160 m², 5.22%), service area (3240 m², 7.83%), circulation area (6260 m², 15.14%), canteen area (3900 m², 9.43%), education area (9000 m², 21.76%), sports area (3300 m², 7.98%), indoor landscape area (12000 m², 29.01%), medical area (1500 m², 3.63%). Additionally, based on the spatial requirements and circulation arrangements for different functions, a preliminary functional zoning for the senior school has been established. Among these, the portion dedicated to intergenerational knowledge exchange holds a central position in the space. In a classroom space, whether the tables and chairs are arranged in an orderly manner or loosely, exhibition racks are essential. Placing the educational achievements of the elderly in the classroom space can enhance their sense of accomplishment.

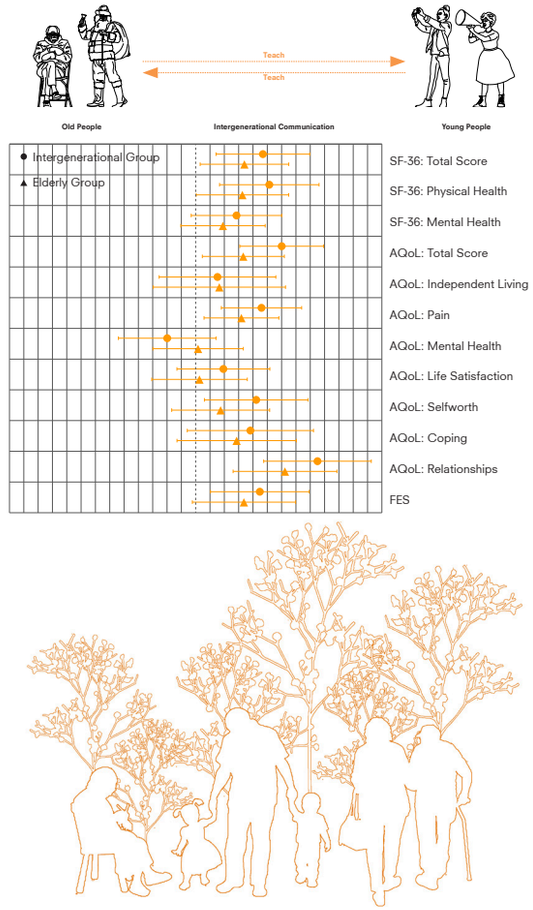


Figure 25. Intergenerational Program

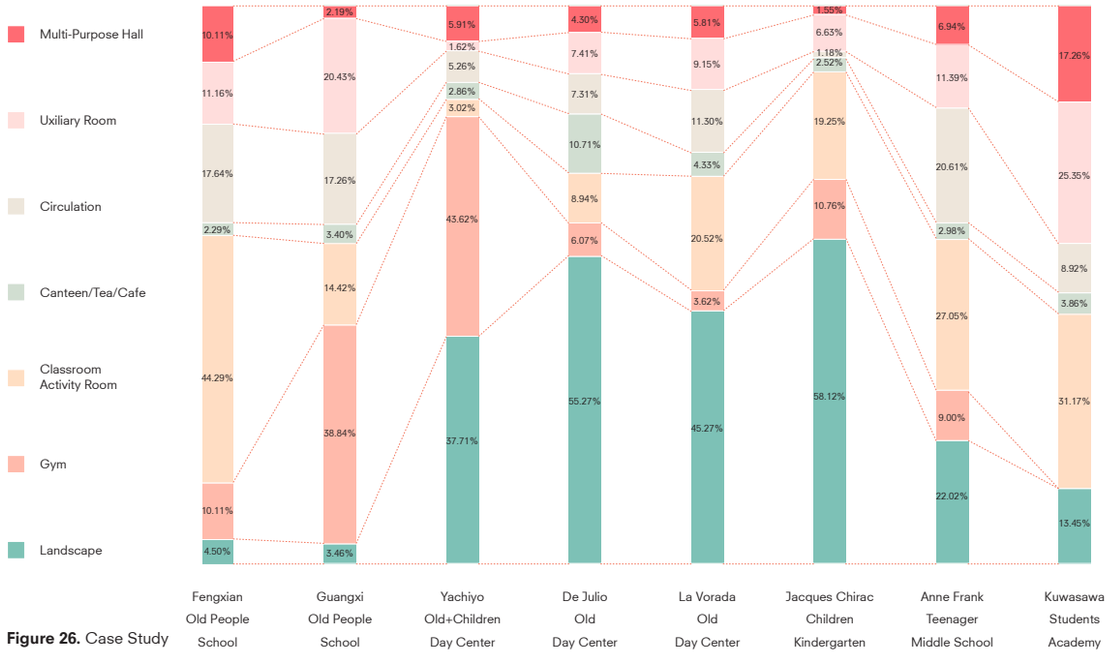


Figure 26. Case Study

Circulation / Canteen / Classroom / Gym / Landscape / Clinic

- **Increase elevators and aisle width for the elderly.**

Circulation / **Canteen** / Classroom / Gym / Landscape / Clinic

- **Increase space for the elderly to communicate with the public.**

Circulation / Canteen / **Classroom** / Gym / Landscape / Clinic

- **Increase diversity in cross-age curriculum.**

Circulation / Canteen / Classroom / **Gym** / Landscape / Clinic

- **Reduce strenuous exercise and increase more gentle physical education classes and contact with nature.**

Circulation / Canteen / Classroom / Gym / **Landscape** / Clinic

- **Increase elderly's contact with nature, such as taking a walk in an indoor garden.**

Circulation / Canteen / Classroom / Gym / Landscape / **Clinic**

- **Increase medical services.**

Figure 27. Program Ambition

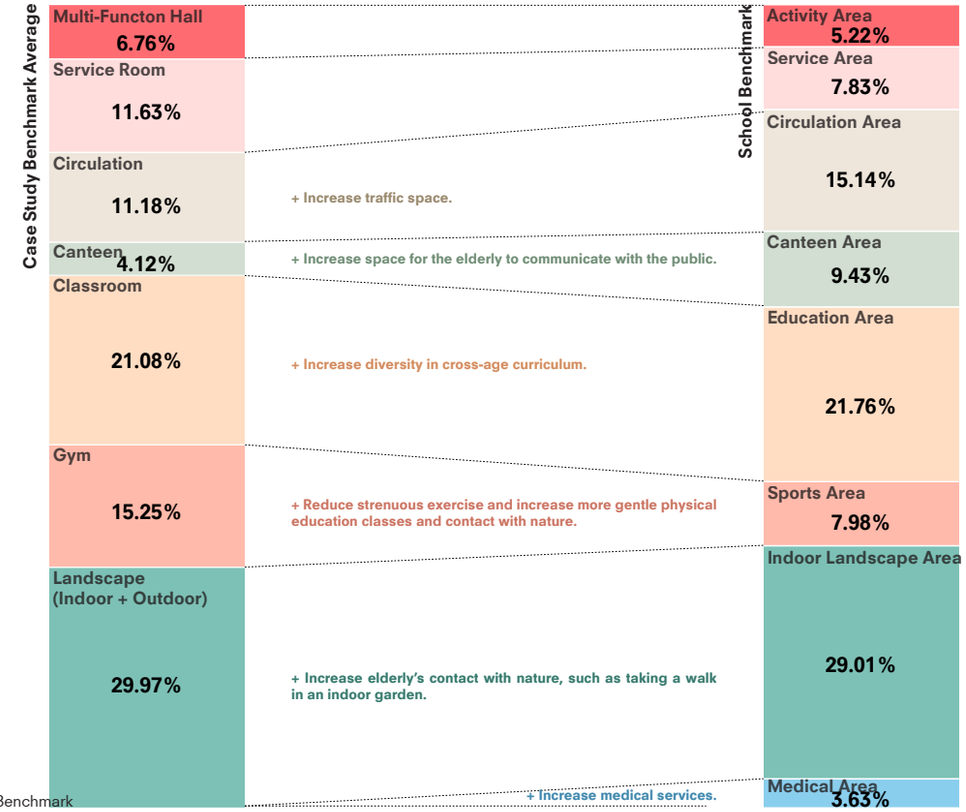
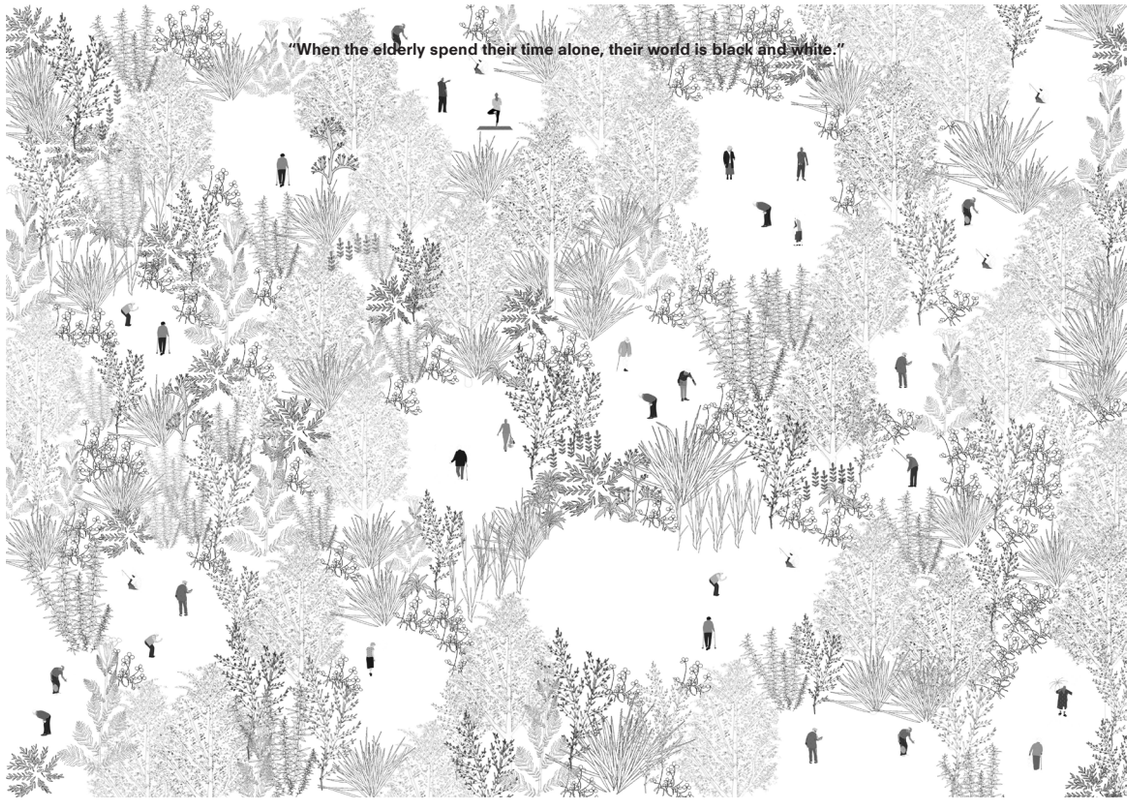


Figure 28. Redifining Benchmark



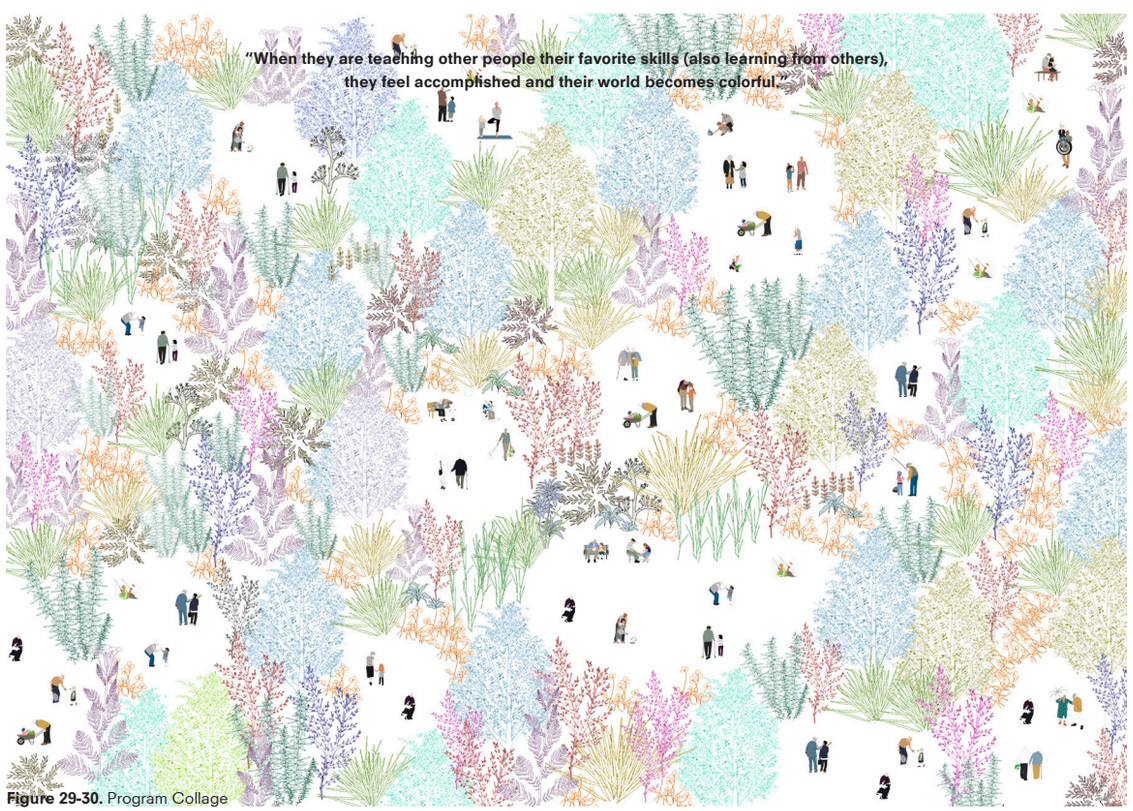


Figure 29-30. Program Collage

Figure 31. Program Benchmark

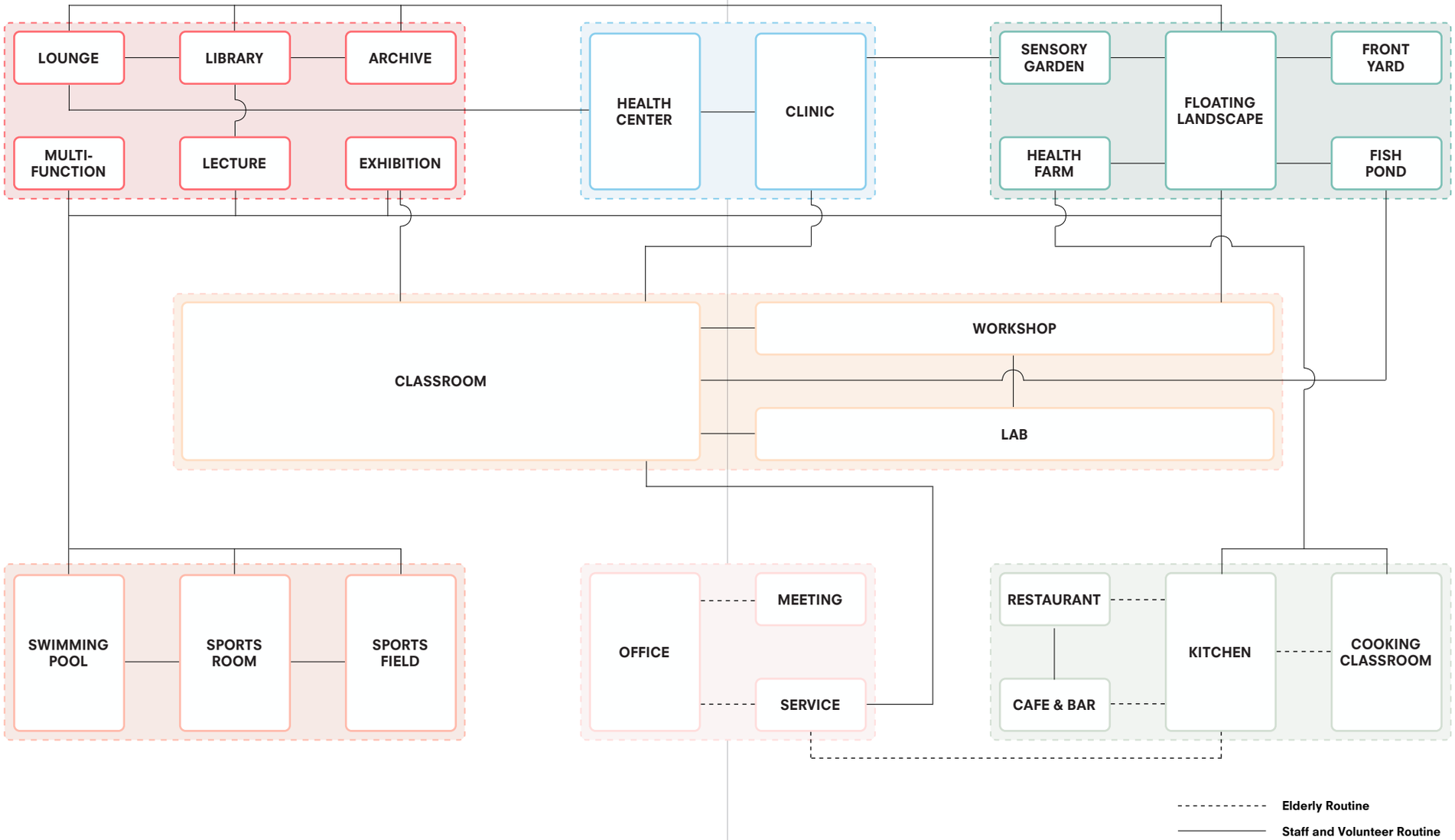


Figure 32. Program Relation Scheme

Drawing Classroom 1

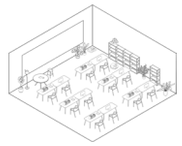
Drawing Classroom 2

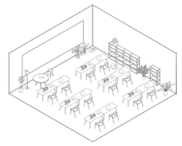
Chess Classroom 1

Chess Classroom 2

Majhong Classroom 1

Majhong Classroom 2


Card-Game Classroom 1


Card-Game Classroom 2

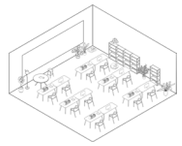
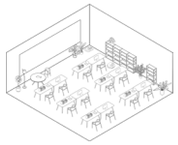
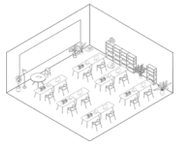
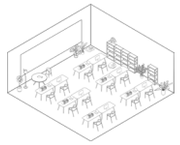


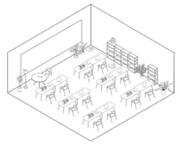
Table-Game Classroom 1

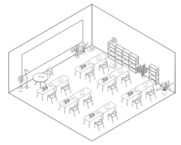
Table-Game Classroom 2

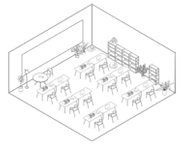

New-Media Classroom 1


New-Media Classroom 2


Music Classroom 1


Music Classroom 2


Pet Classroom 1


Pet Classroom 2

Urban-History Classroom 1

Urban-History Classroom 2

Literature Classroom 1

Literature Classroom 2

Calligraphy Classroom 1

Calligraphy Classroom 2

Piano Classroom 1

Piano Classroom 2

Opera Classroom 1

Opera Classroom 2

Farming Classroom 1

Farming Classroom 2

Photography Classroom 1

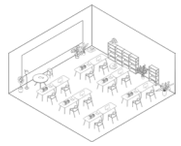
Photography Classroom 2

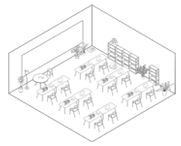
Parenting Classroom 1

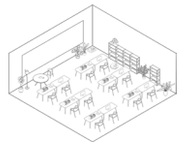
Parenting Classroom 2

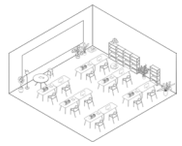
Fashion-Management Classroom 1

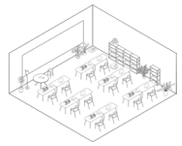
Fashion-Management Classroom 1


Health-Care Classroom 1


Health-Care Classroom 2


Social-Knowledge Classroom 1


Social-Knowledge Classroom 2


Fishing Classroom 1

Fishing Classroom 2

Cooking Classroom 1

Cooking Classroom 2

Cooking Classroom 3

Cooking Classroom 4

Cooking Classroom 5

Yoga Classroom 1

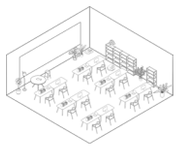
Yoga Classroom 2

Dancing Classroom 1

Dancing Classroom 2

Fitness Classroom 1

Fitness Classroom 2


Therapy Classroom 1

Therapy Classroom 2

Meditation Classroom 1

Meditation Classroom 2

Papercut Workshop 1

Papercut Workshop 2

Papercut Workshop 3

Knitting Workshop 1

Knitting Workshop 2

Knitting Workshop 3

Handicraft Workshop 1

Handicraft Workshop 2

Handicraft Workshop 3

Woodencraft Workshop 1

Woodencraft Workshop 2

Woodencraft Workshop 3

Origami Workshop 1

Origami Workshop 2

Origami Workshop 3

Lab 1

Lab 2

Lab 3

Lab 4

Lab 5

Figure 33. Intergenerational Classrooms

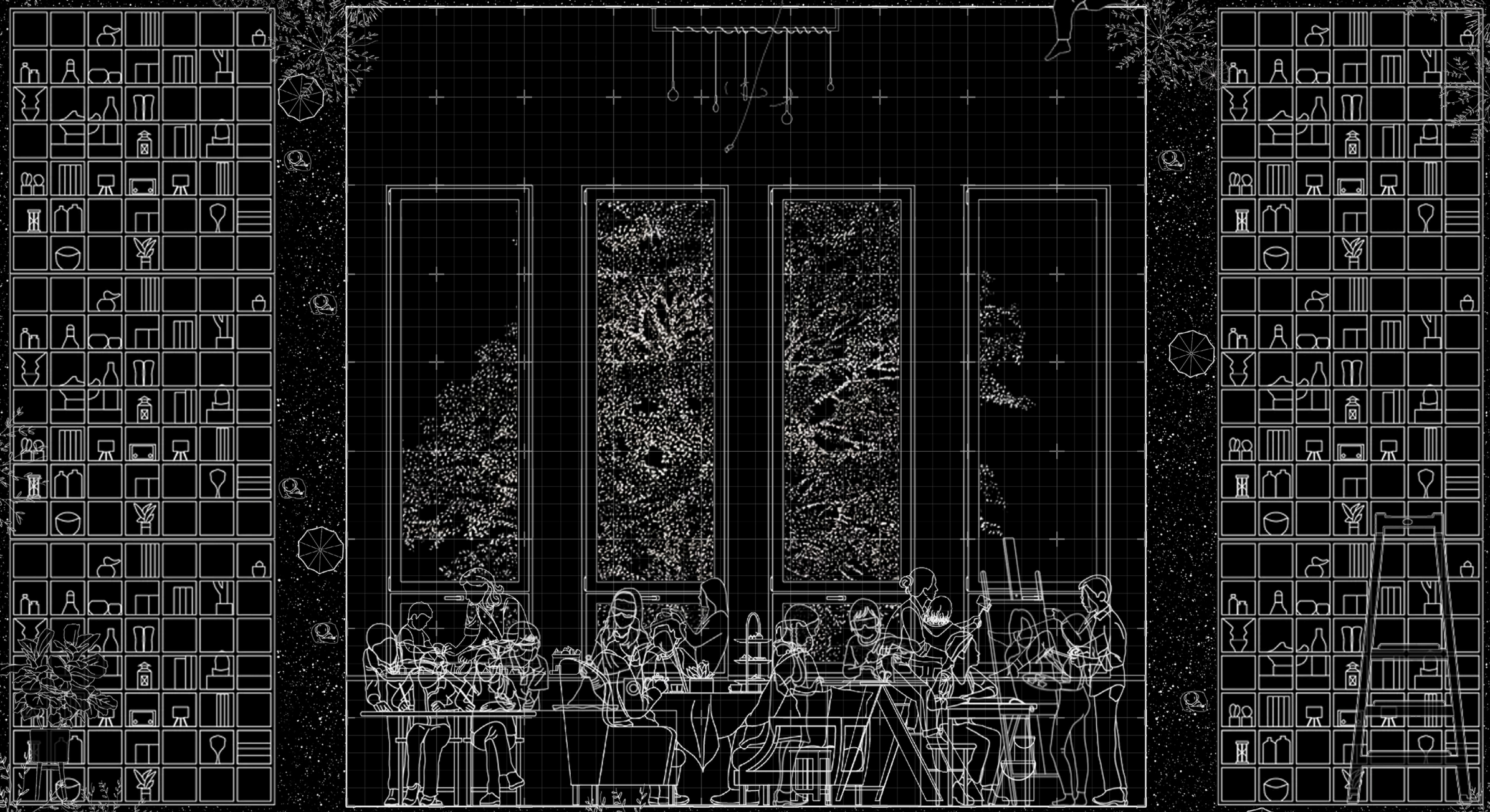


Figure 34: Participatory Design

4.3 Site

According to the three aspects of elderly health (physical health, mental health and social health), the project's site ambition and site criteria are divided into six corresponding points.

Site ambition includes:
1. Provide a comfortable indoor and outdoor environment for the elderly.
2. Help the elderly have a sense of self-achievement.
3. Provide aging-appropriate transportation.
4. Promote intergenerational knowledge exchanges.
5. Create a better community environment.
6. Create facilities suitable for the elderly.

Site criteria corresponds to:
1. The site should be connected to urban greening.
2. The venue should be located in a place where the mental health of the elderly is not high.
3. The venue should be in a place with convenient transportation.
4. The venue should be close to mixed-age communities.
5. The site should be close to the community that needs to be improved.
6. The site should be in a place where elderly-friendly facilities are needed.
Based on the above criteria and after mapping comparison, it was determined that the final site was an open space in Fennpfuhl, Lichtenberg.

The residential area near Fennpfuhl is one of the oldest and largest prefabricated housing estates in East Berlin, housing a significant number of both elderly and young residents. Fennpfuhl Lake is situated at the heart of the green park, with several residential blocks on the opposite bank occupied by some elderly individuals and families with young children. On the eastern side of the lake, close to a sports center, is a popular sports center for the younger residents. There are also school clusters near the area, including kindergartens, primary schools, and a music academy. In the future, the elderly school, in connection with the surrounding schools and sports centers, will be able to provide more comprehensive service facilities for the community. This will make it a place that the local elderly population will enjoy frequenting.

Looking back at the history of the Fennpfuhl area, since the last century, there have been some park service facilities along the lake that were once established but eventually discontinued due to operational costs and other issues. This resulted in a limited range of services in the park. At the same time, the elderly in the area lacked an indoor public space for socializing. During the cold winters or hot summers, they couldn't spend extended periods walking in the park and often had to stay alone at home.

The placement of the new elderly school on the site will enhance the area's overall living amenities. It will provide an indoor garden for the elderly to engage in intergenerational knowledge exchange. Various school activities will enrich their daily lives, elevating the overall quality of life and happiness for residents of all ages. The indoor and outdoor landscapes of the school offer diverse sensory environments to improve cognitive functions in aging individuals and promote intergenerational communication.

Through a comparison of possible volumes within the site, a volume suitable for the site's traffic network and the shape of the lake was finally selected. The volume is divided into two parts through the facade material. The facade material near the lake fishing area is made of transparent glass curtain wall, which is convenient for enjoying the lake view. The facade material of the other part is digital glazed glass, which can soften the sunlight and prevent glare, and produce unique light and shadow effects. Translucent materials are used on the exterior facades to allow natural light to enter the interior. The indoor display rack becomes an important spatial element, displaying the handicrafts of the elderly. There are landscapes and seats both indoors and outdoors, creating a suitable communication space for the elderly.

Figure 35. Site Photos

Figure 36. Site Photos

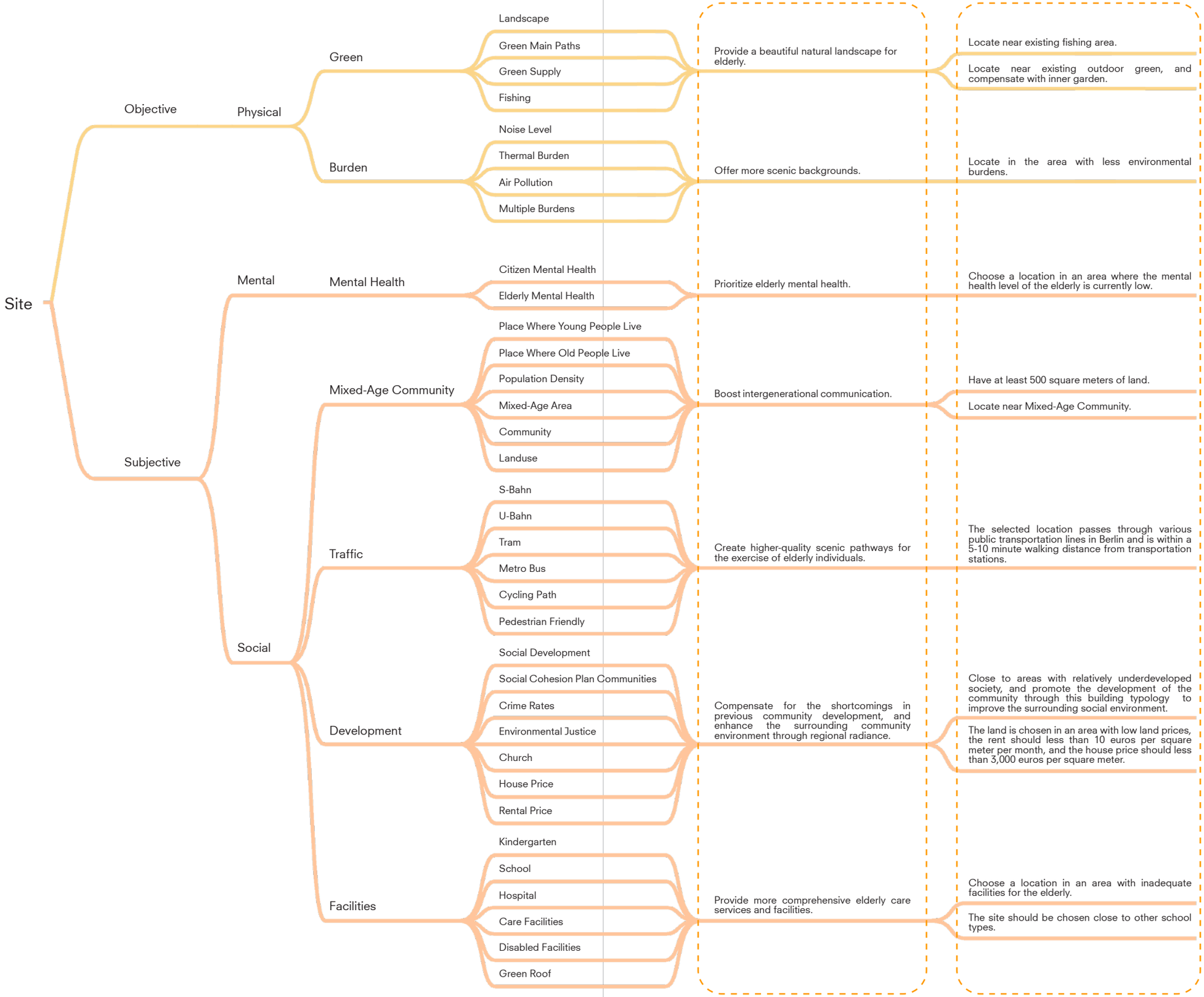
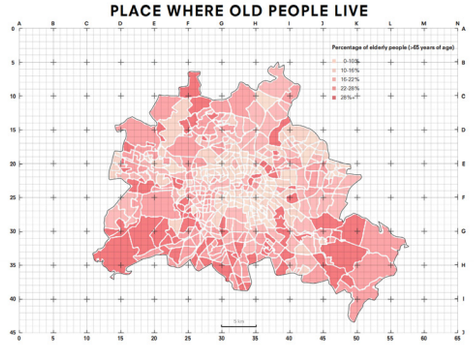
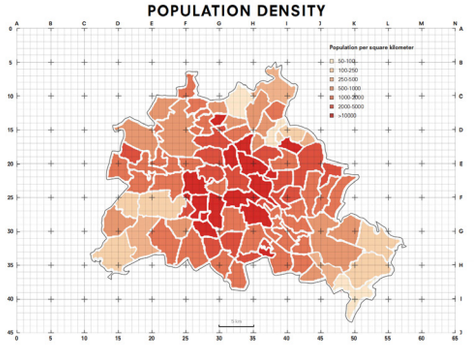


Figure 37. Site Evaluation System

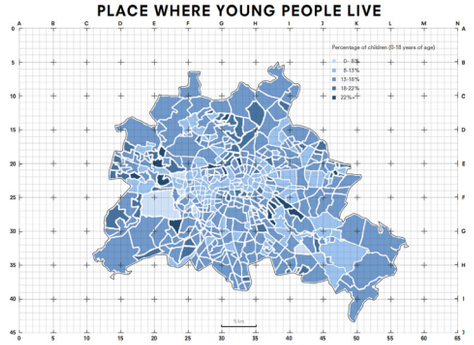
School
PLACE WHERE OLD PEOPLE LIVE



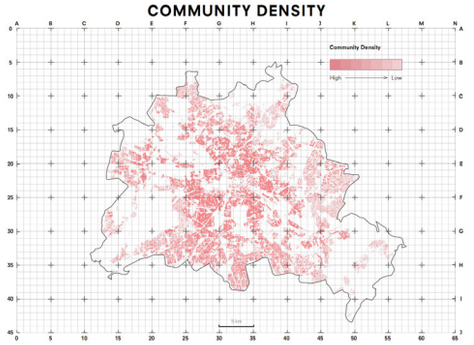
School
POPULATION DENSITY



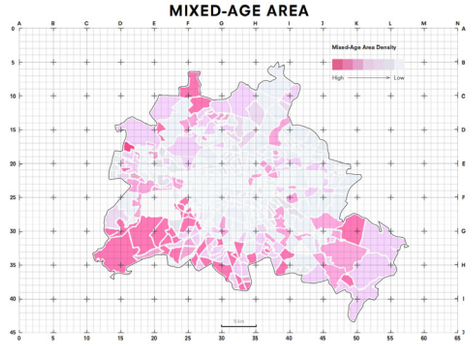
School
PLACE WHERE YOUNG PEOPLE LIVE



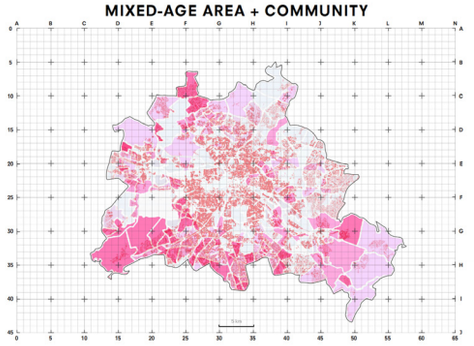
School
COMMUNITY DENSITY



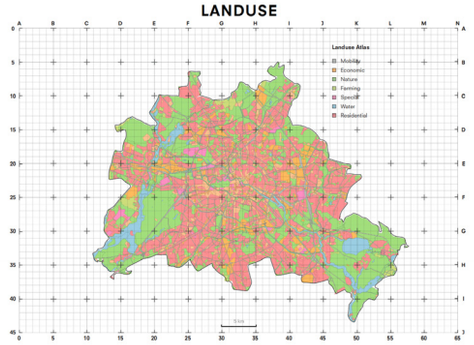
School
MIXED-AGE AREA



School
MIXED-AGE AREA + COMMUNITY



School
LANDUSE



School
MIXED-AGE COMMUNITY

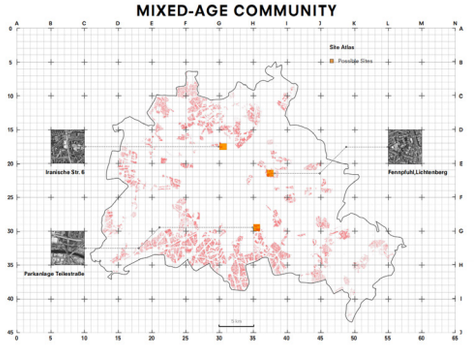
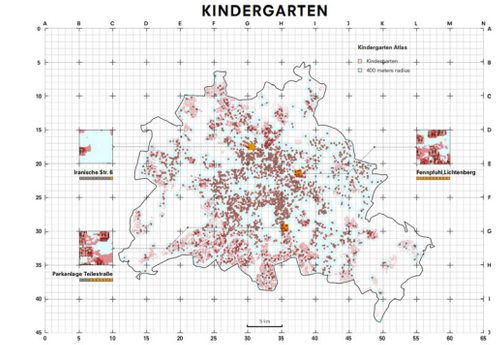
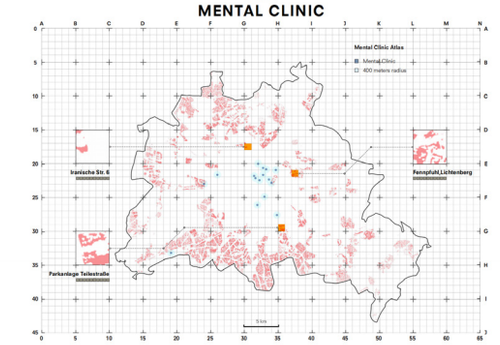


Figure 38-53. Urban Scale Site Analysis

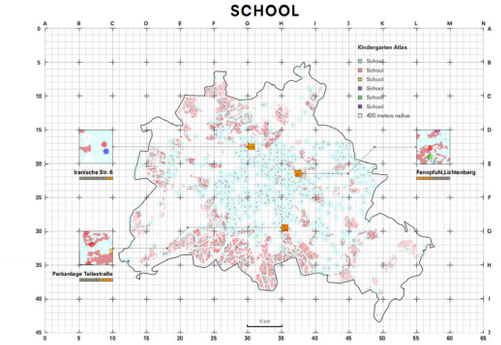
School
KINDERGARTEN



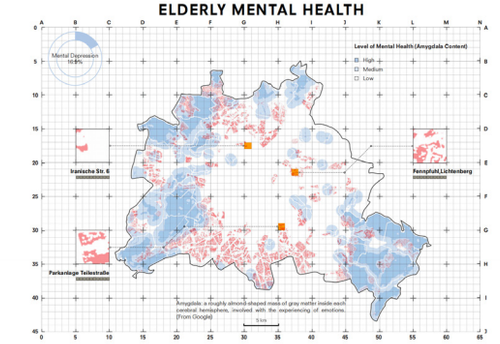
School
MENTAL CLINIC



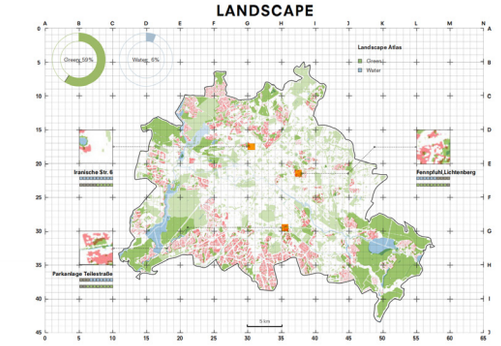
School
SCHOOL



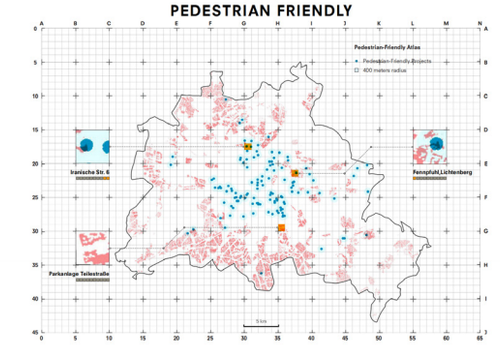
School
ELDERLY MENTAL HEALTH



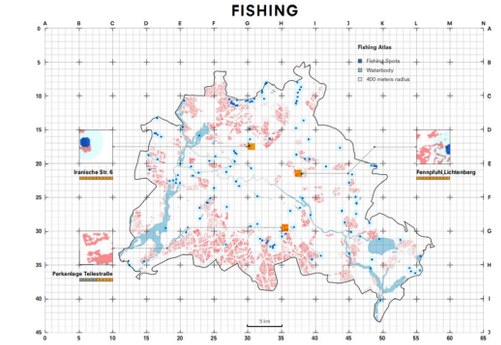
School
LANDSCAPE



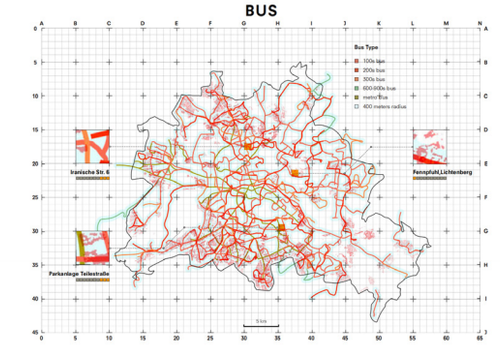
School
PEDESTRIAN FRIENDLY



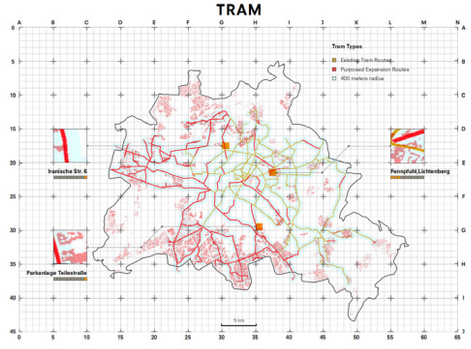
School
FISHING



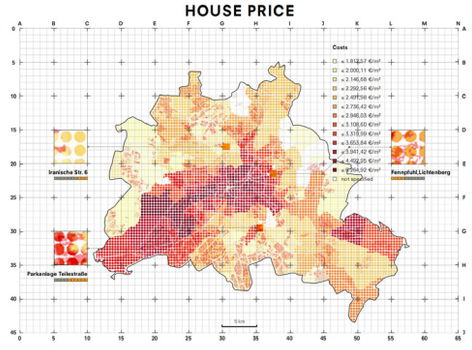
School
BUS



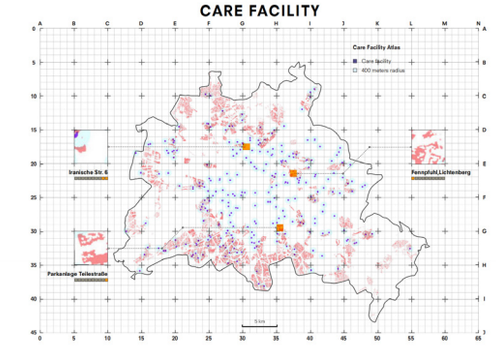
School
TRAM



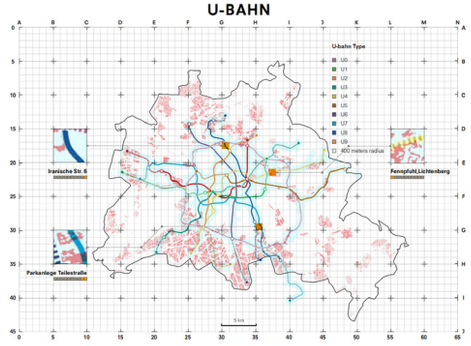
School
HOUSE PRICE



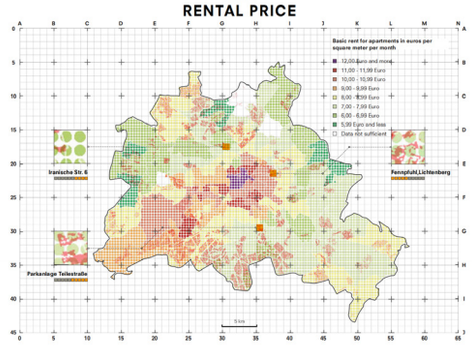
School
CARE FACILITY



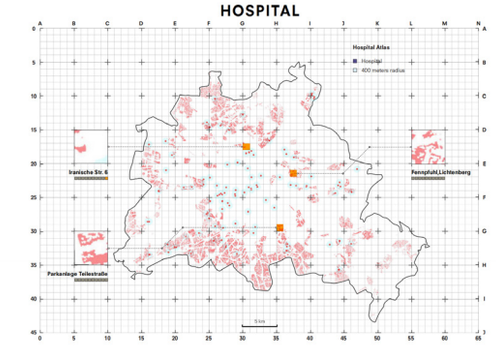
School
U-BAHN



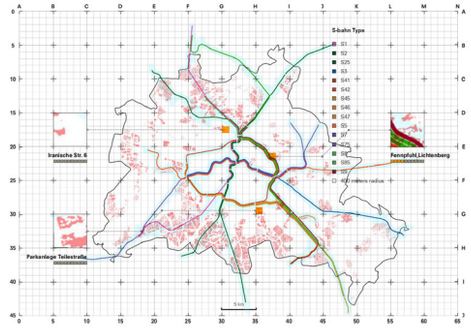
School
RENTAL PRICE



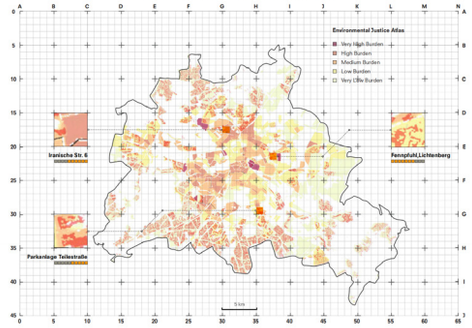
School
HOSPITAL



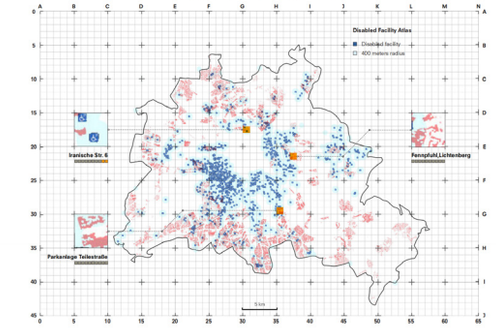
School
S-BAHN



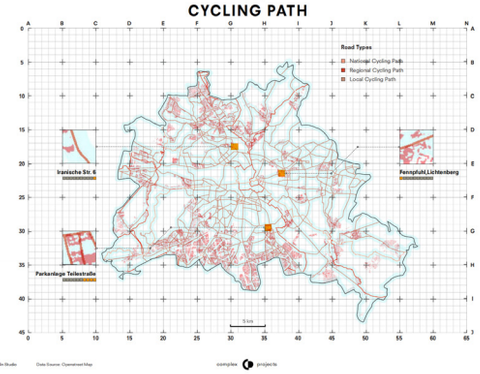
School
ENVIRONMENTAL JUSTICE



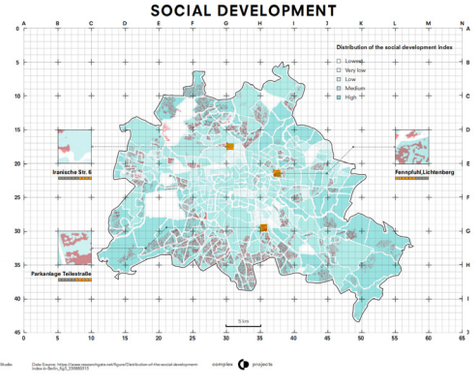
School
DISABLED FACILITY



School
CYCLING PATH



School
SOCIAL DEVELOPMENT



School
SITE

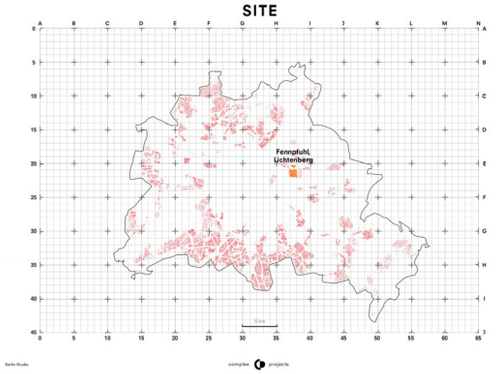
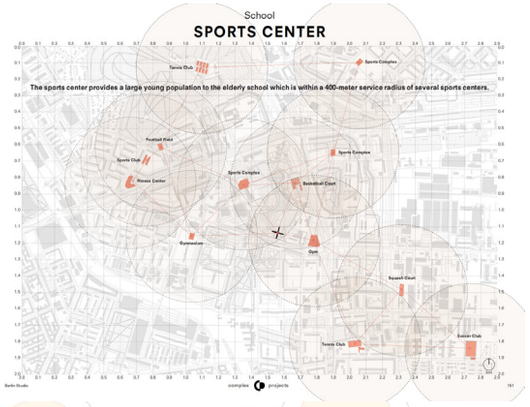


Figure 54-65. Urban Scale Site Analysis

School
LICHTENBERG

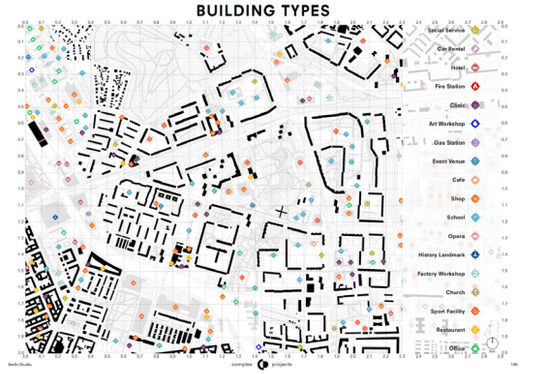
School
SPORTS CENTER



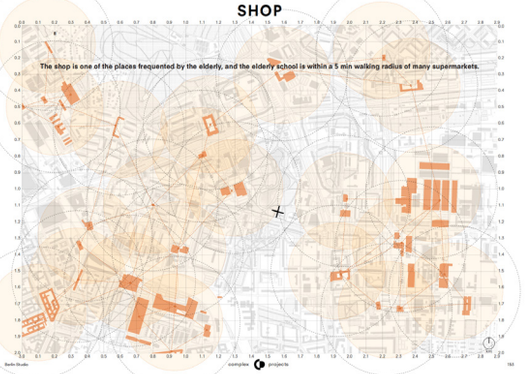
School
RESIDENTIAL AREA

School
SOCIAL SERVICE ORGANIZATION

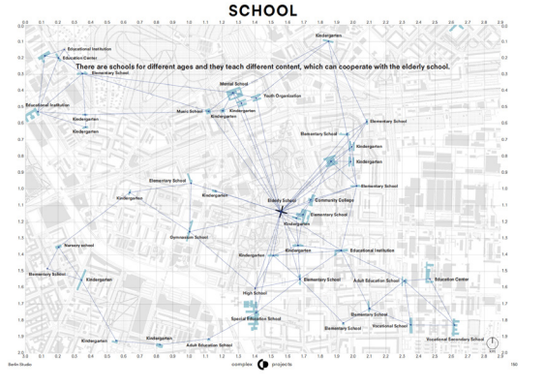
School
BUILDING TYPES



School
SHOP



School
SCHOOL



School
RESTAURANT + CAFÉ

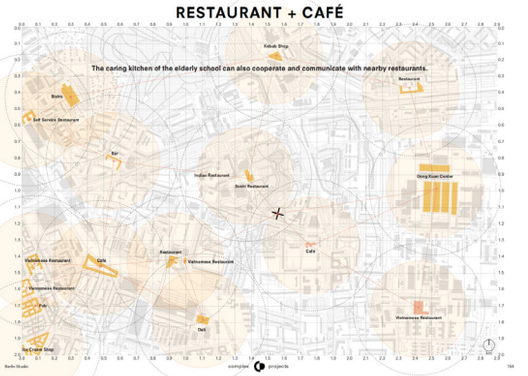
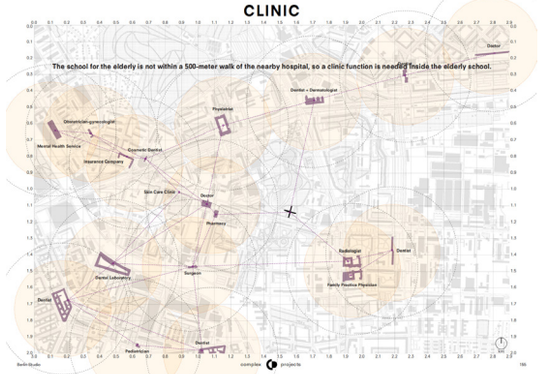
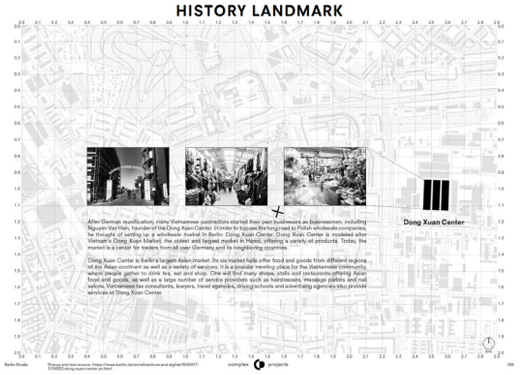


Figure 66-81. Block Scale Site Analysis

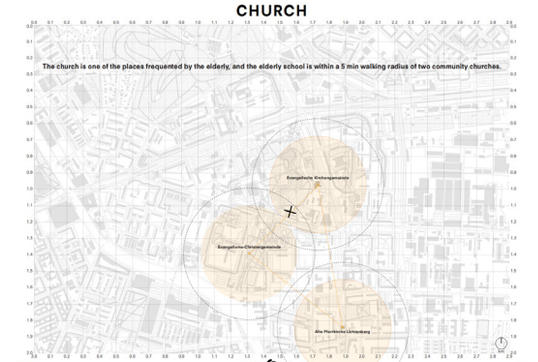
School
CLINIC



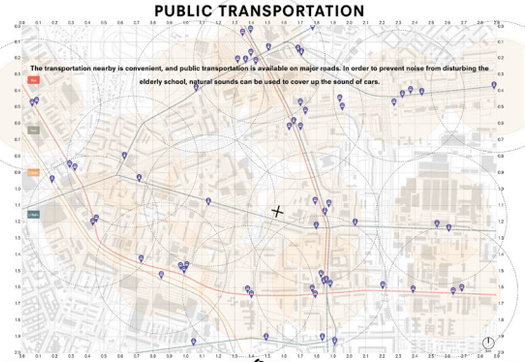
School
HISTORY LANDMARK



School
CHURCH

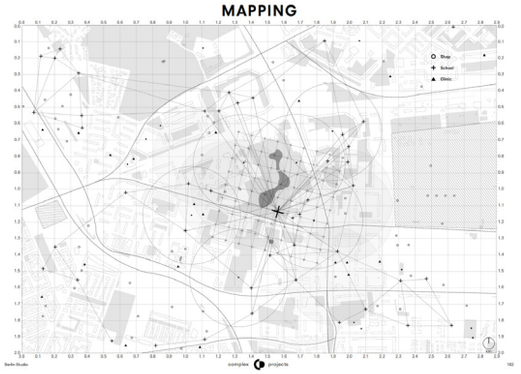


School
PUBLIC TRANSPORTATION

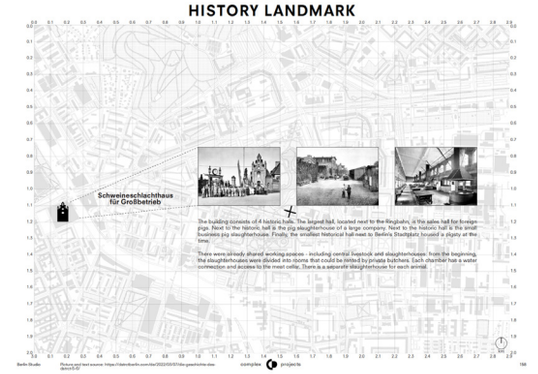


School
LANDSCAPE

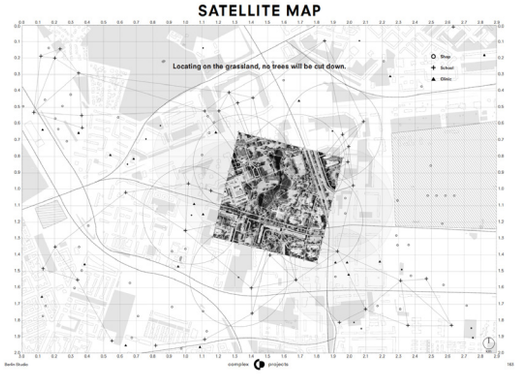
School
MAPPING



School
HISTORY LANDMARK



School
SATELLITE MAP



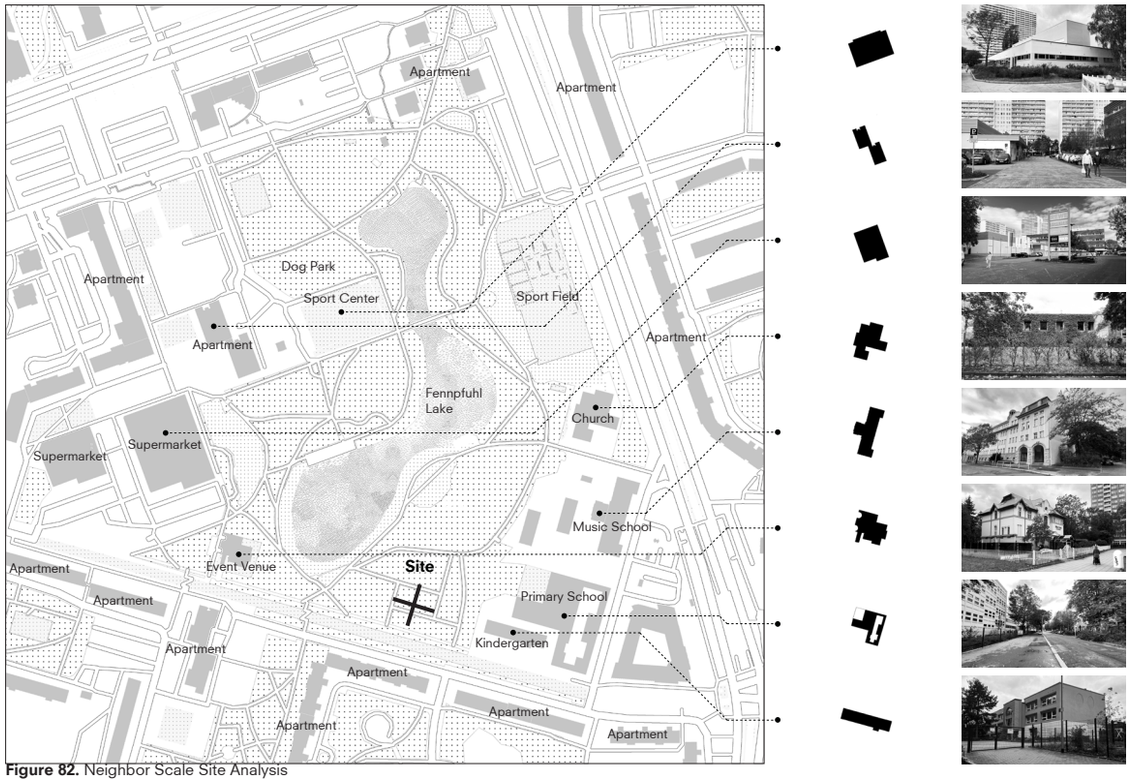


Figure 82. Neighbor Scale Site Analysis

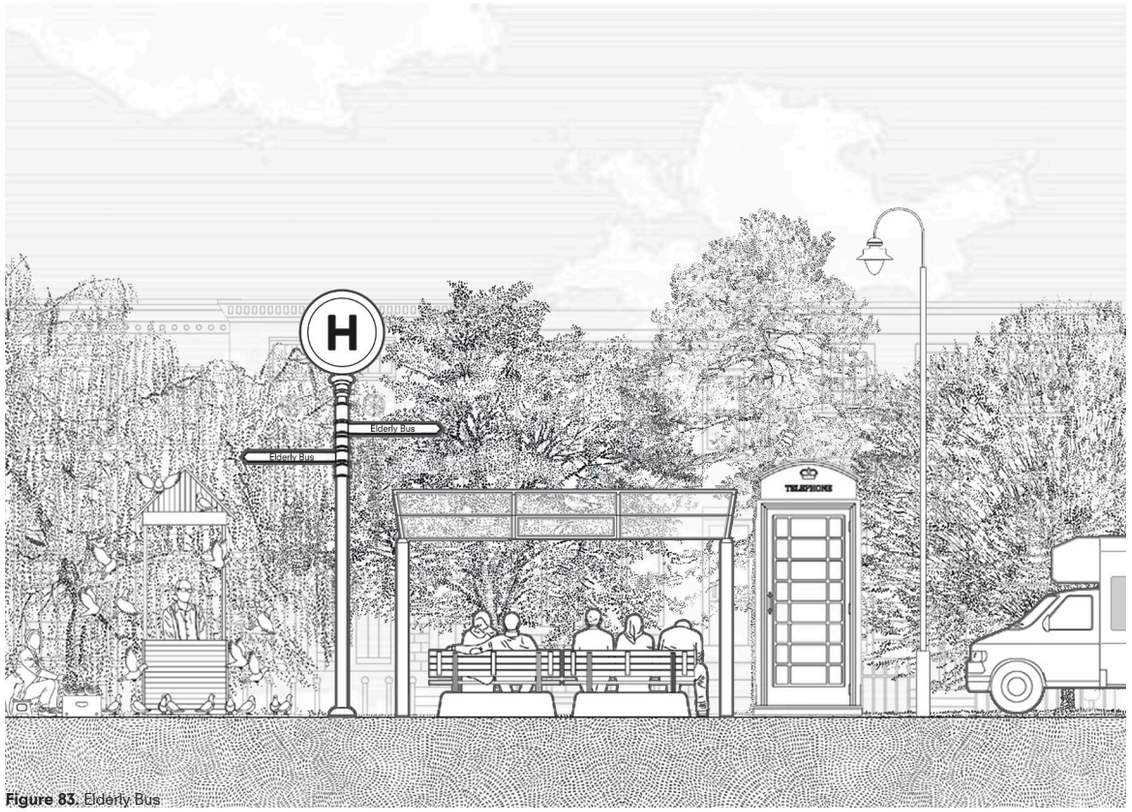


Figure 83. Elderly Bus

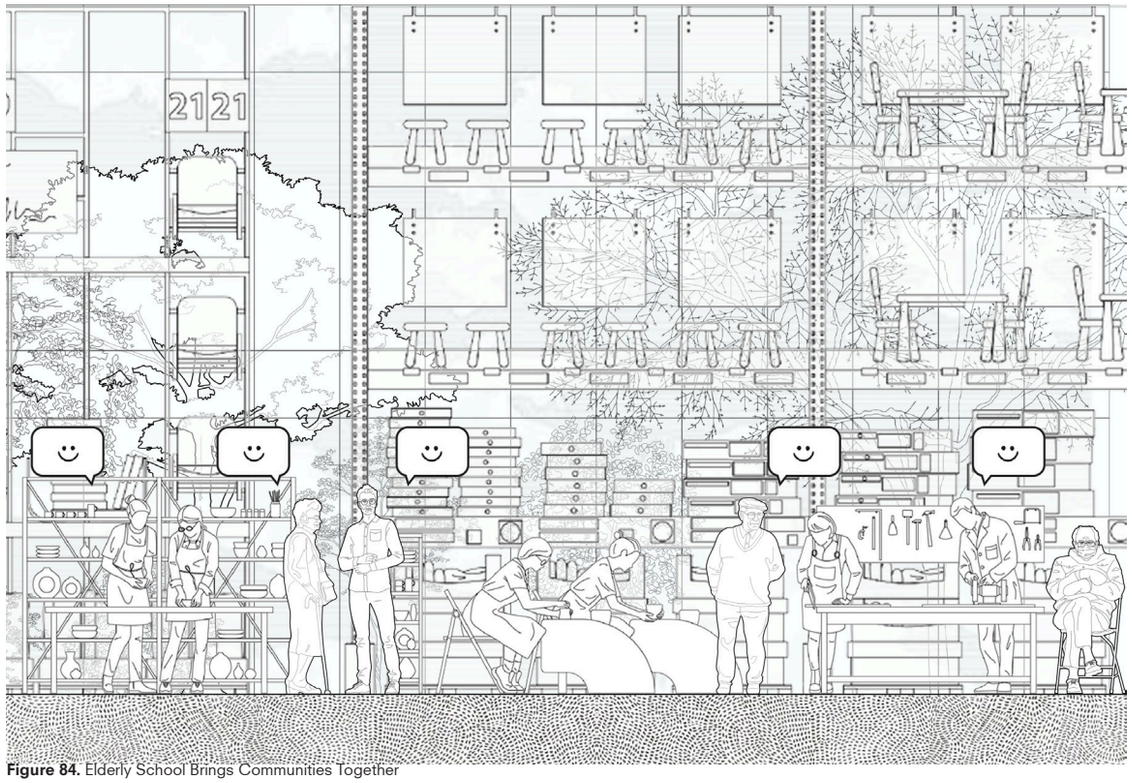


Figure 84. Elderly School Brings Communities Together

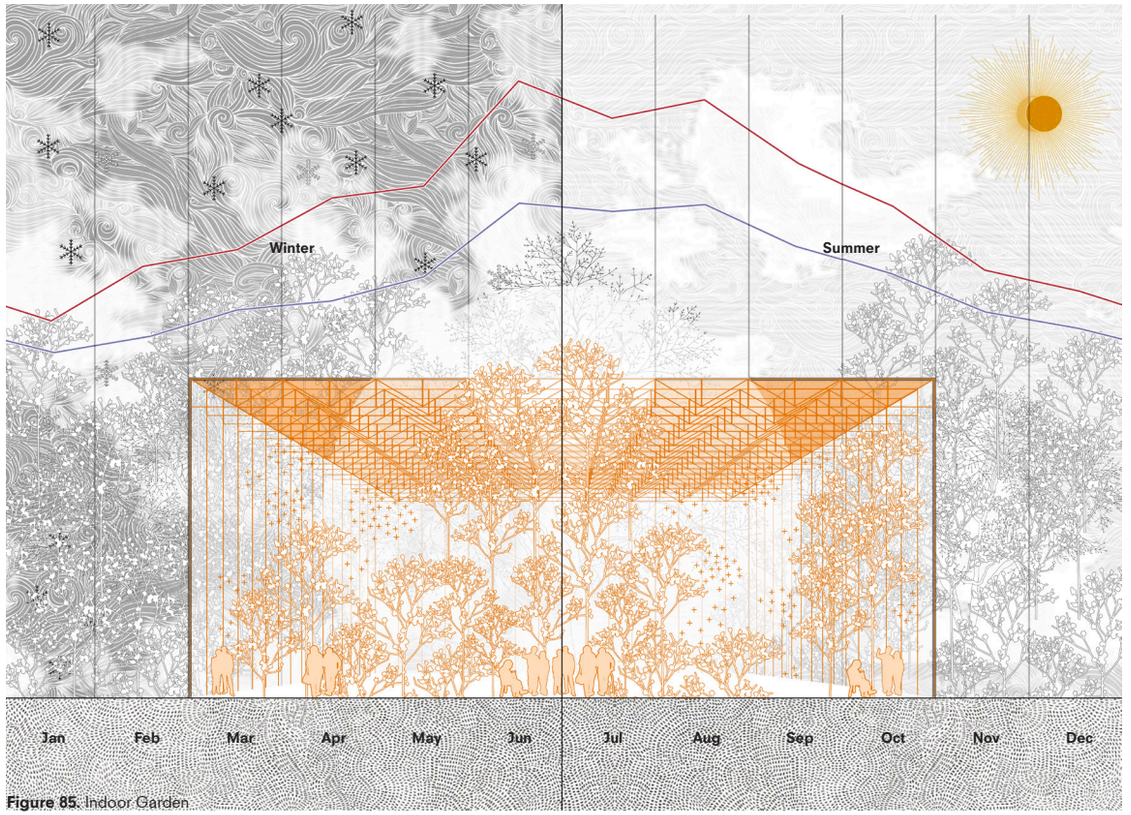


Figure 85. Indoor Garden

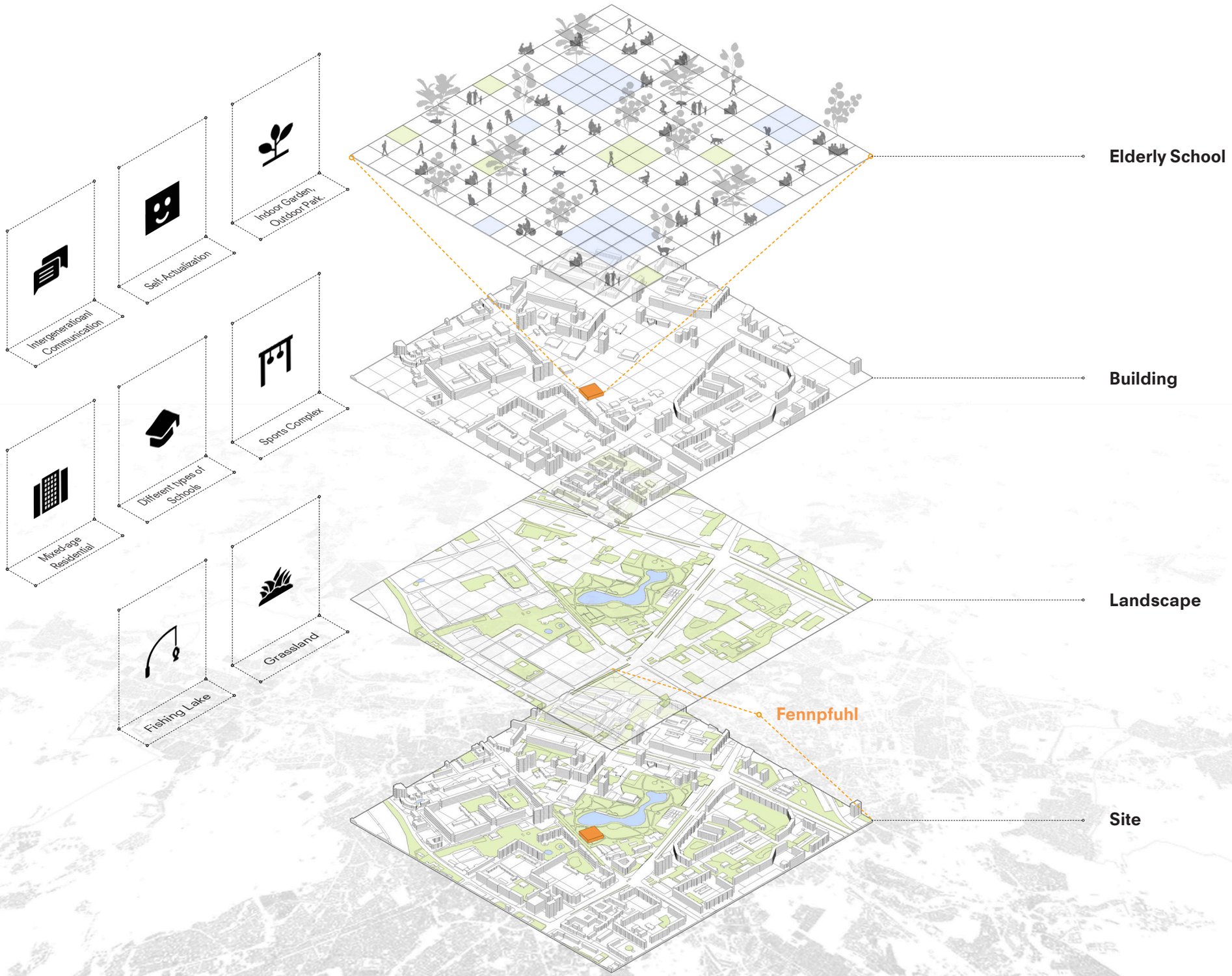


Figure 86. Layers of Site Analysis

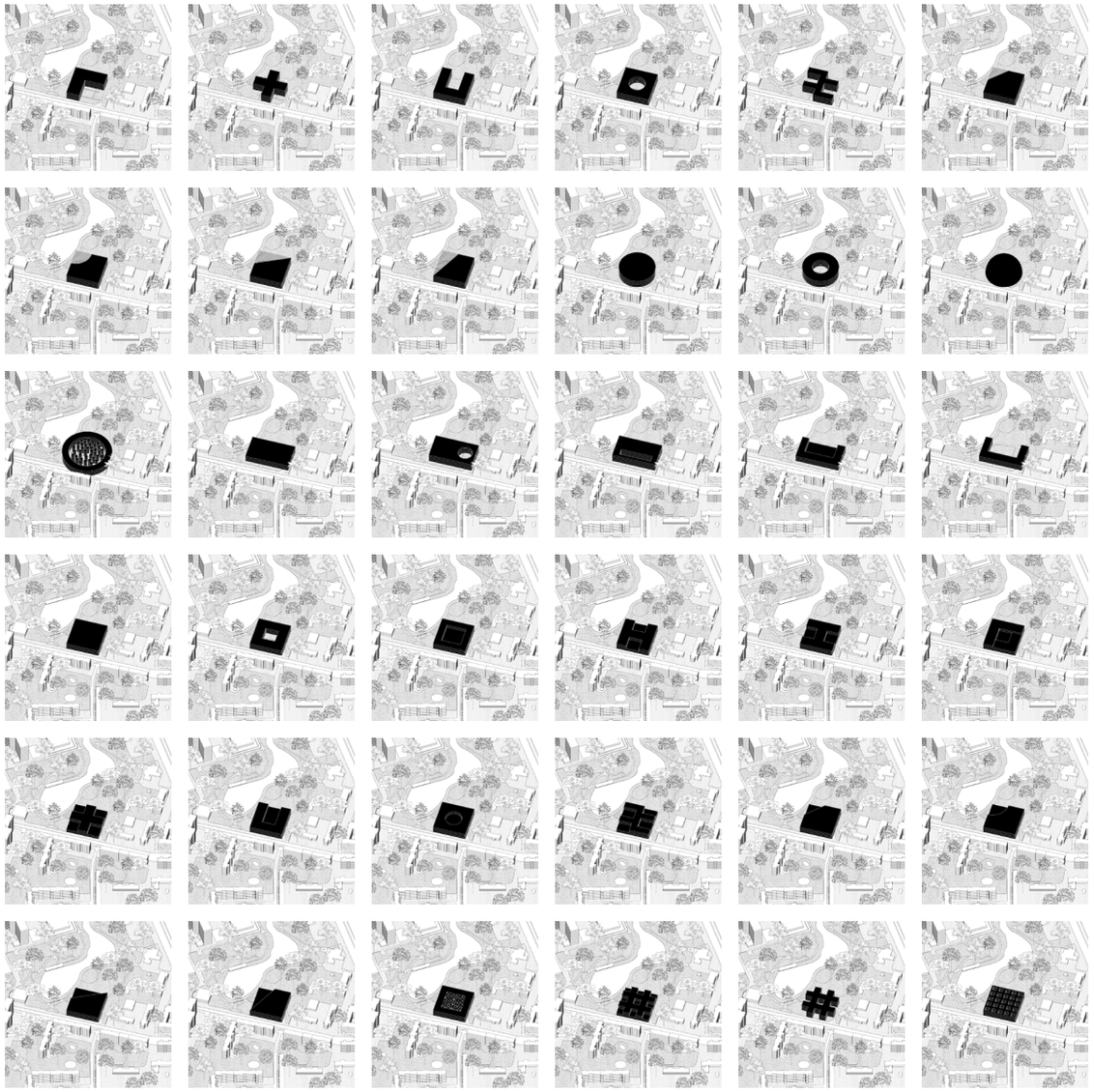


Figure 87. Massing Comparison

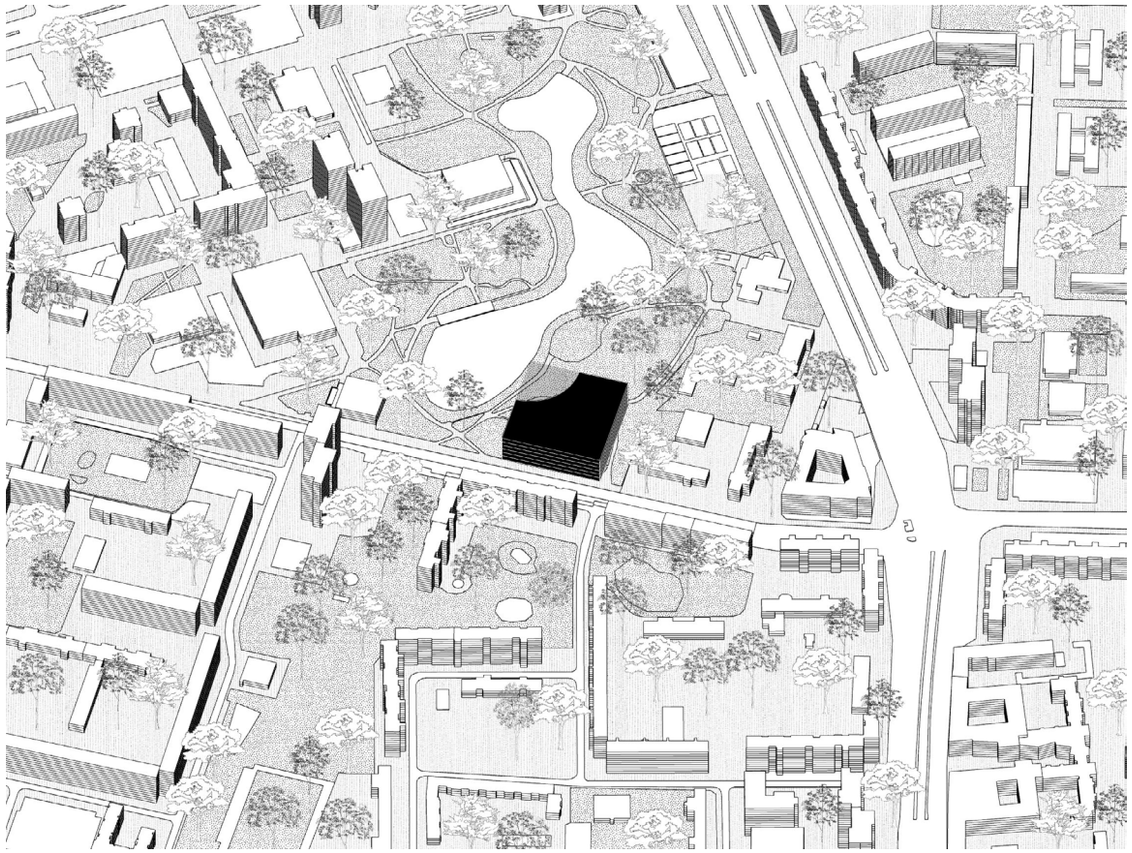


Figure 88. Selected Massing

Figure 89. Multi-Sensory Design

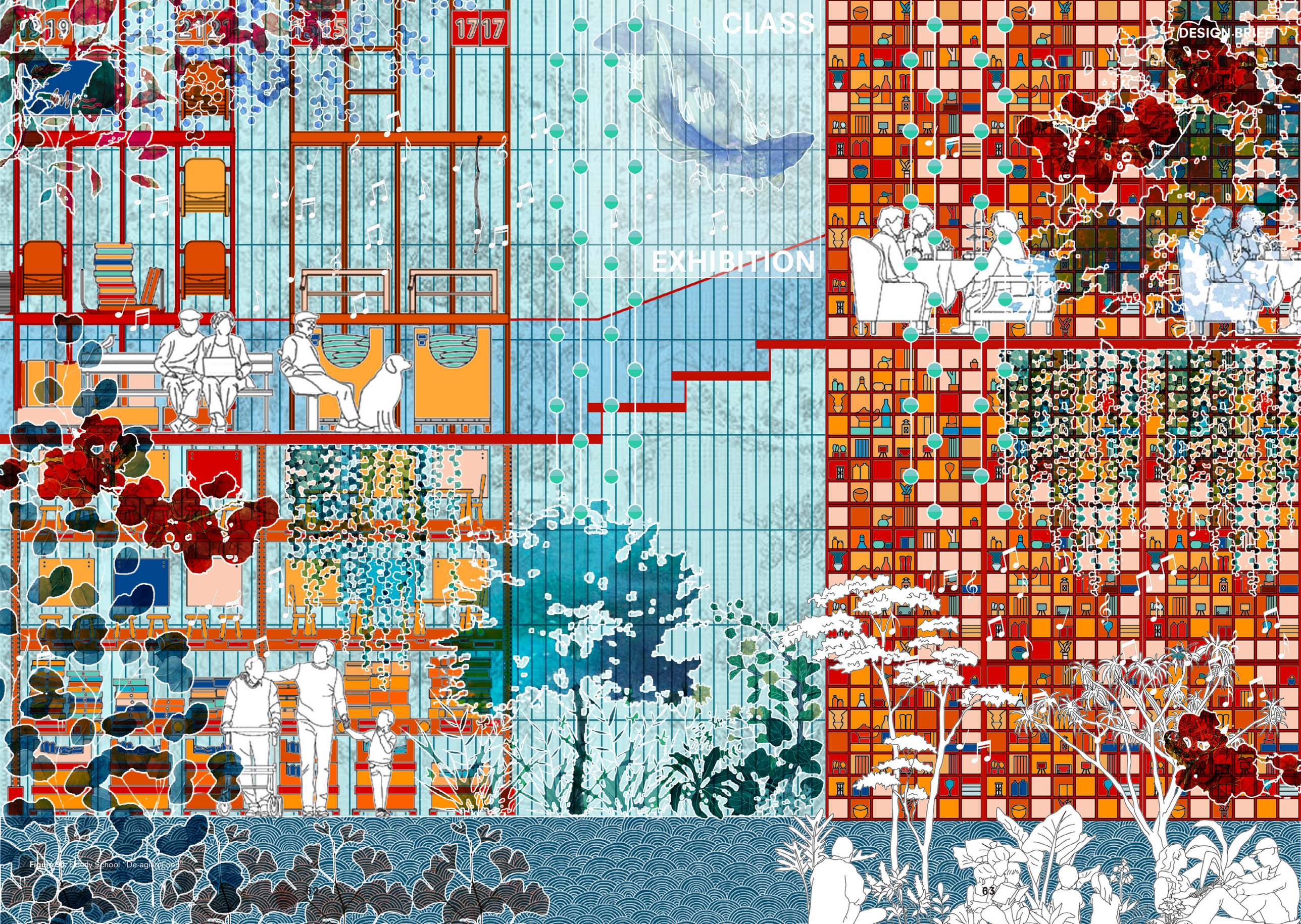


Figure 30: Elderly School "De-aging Eden"

BIBLIOGRAPHY

05

Bibliography

1 School_1 Noun - Definition, pictures, pronunciation and usage notes | Oxford Advanced Learner's Dictionary at OxfordLearnersDictionaries.com. (z.d.). https://www.oxfordlearnersdictionaries.com/definition/english/school_1#:~:text=%5Bcountable%5D%20a%20place%20where%20children%20go%20to%20be%20educated

2 Schwär, H. (2019, 23 december). Arbeit, Wohnen, Verkehr: Wie Deutschland 2030 aussieht. Business Insider. https://www.businessinsider.de/wirtschaft/forscher-zeigen-an-7-beispielen-wie-radikal-sich-deutschland-in-den-naechsten-10-jahren-veraendern-wird/

3 Ahlawat, H., Darcovich, A., Dewhurst, M., Feehan, E., Hediger, V., & Maud, M. (2023, 22 mei). Age is just a number: How older adults view healthy aging. McKinsey & Company. https://www.mckinsey.com/mhi/our-insights/age-is-just-a-number-how-older-adults-view-healthy-aging

4 遇见老年人. (z.d.). 被称为“养老天堂”的德国,有哪些养老模式? 知乎专栏. https://zhuanlan.zhihu.com/p/436582901

5 Shun, K. (1997). Mencius and early Chinese thought. In Stanford University Press eBooks. https://doi.org/10.1515/9781503616264

6 Ahmed, M. (2014). 6 Lifelong learning in a learning society: Are community learning centres the vehicle? In Brill | Nijhoff eBooks (pp. 102–125). https://doi.org/10.1163/9789004281158_007

7 Nearly 6 million older people live alone. (z.d.). Federal Statistical Office. https://www.destatis.de/EN/Press/2021/09/PE21_N057_12411.html

8 Maslow, A. H. (1943). A theory of human motivation. Psychological Review, 50(4), 370–396. https://doi.org/10.1037/h0054346

9 Norman, D. A. (1988). The design of everyday things. http://documents.irevues.inist.fr/bitstream/2042/30193/1/XX_CNE-Prospective_000738.pdf

10 深澤直. (2018b). Naoto Fukasawa : Embodiment. In Phaidon eBooks. https://ci.nii.ac.jp/ncid/BB26601404

11 ûïĵσû σ--. (z.d.). http://www.uml.org.cn/jmshj/201308303.asp

12 Pallasmaa, J. (1996). The eyes of the skin: architecture and the senses. https://ixtheo.de/Record/1651593418

13 遇见老年人. (z.d.). 被称为“养老天堂”的德国,有哪些养老模式? 知乎专栏. https://zhuanlan.zhihu.com/p/436582901

14 Schwär, H. (2019, 23 december). Arbeit, Wohnen, Verkehr: Wie Deutschland 2030 aussieht. Business Insider. https://www.businessinsider.de/wirtschaft/forscher-zeigen-an-7-beispielen-wie-radikal-sich-deutschland-in-den-naechsten-10-jahren-veraendern-wird/

FIGURES

06

Figures

Figure 5 zh.zhujiworld.com. (z.d.). 柏林, 德国 — 2023年统计. Copyright, zh.zhujiworld.com. All rights reserved. https://zh.zhujiworld.com/de/1580917-berlin/

Figure 6 Schwär, H. (2019, 23 december). Arbeit, Wohnen, Verkehr: Wie Deutschland 2030 aussieht. Business Insider. https://www.businessinsider.de/wirtschaft/forscher-zeigen-an-7-beispielen-wie-radikal-sich-deutschland-in-den-naechsten-10-jahren-veraendern-wird/
Newsham, N., & Rowe, F. (2019). Projecting the demographic impact of Syrian migration in a rapidly ageing society, Germany. Journal of Geographical Systems, 23(2), 231–261. https://doi.org/10.1007/s10109-018-00290-y

Figure 7 Ahlawat, H., Darcovich, A., Dewhurst, M., Feehan, E., Hediger, V., & Maud, M. (2023, 22 mei). Age is just a number: How older adults view healthy aging. McKinsey & Company. https://www.mckinsey.com/mhi/our-insights/age-is-just-a-number-how-older-adults-view-healthy-aging

Figure 11 Psychologist, J. S. B. (2023, 26 april). What is Self-Actualization? Meaning, Theory + examples. PositivePsychology.com. https://positivepsychology.com/self-actualization/

Figure 13 深泽直人:无意识设计,为B&B Italia品牌带来极简禅意之美. (z.d.). https://news.tom.com/201811/4653910490.html

Figure 14 多感官艺术装置,意大利 / Fabrica. (z.d.). gooood. https://www.gooood.cn/hot-cold-by-fabrica.htm

Figure 15 Florian, M. (2023, 19 september). The Expert Citizen: A Change of Perspectives in Participatory Design. ArchDaily. https://www.archdaily.com/983107/the-expert-citizen-a-change-of-perspectives-in-participatory-design

Figure 18 遇见老年人. (z.d.). 被称为“养老天堂”的德国,有哪些养老模式？知乎专栏. https://zhuanlan.zhihu.com/p/436582901

Figure 25 Minghetti, A., Donath, L., Zahner, L., Hanssen, H., & Faude, O. (2021). Beneficial effects of an intergenerational exercise intervention on health-related physical and psychosocial outcomes in Swiss preschool children and residential seniors: a clinical trial. PeerJ, 9, e11292. https://doi.org/10.7717/peerj.11292

Figure 39
Figure 40 Kabisch, N., & Van Den Bosch, M. (2017). Urban green spaces and the potential for health improvement and environmental justice in a changing climate. In Theory and practice of urban sustainability transitions (pp. 207–220). https://doi.org/10.1007/978-3-319-56091-5_12

Figure 41 Sebastian-Meier. (z.d.). ThirtyDayMapChallenge2020/Maps/18 at main · Sebastian-meier/ThirtyDayMapChallenge2020. GitHub. https://github.com/sebastian-meier/ThirtyDayMapChallenge2020/tree/main/maps/18

Figure 42 Wikipedia contributors. (2024, 5 januari). Demographics of Berlin. Wikipedia. https://en.wikipedia.org/wiki/Demographics_of_Berlin#/media/File:Metropolregion_Berlin-Brandenburg_Einwohnerdichte.svg

Figure 43 Sebastian-Meier. (z.d.-b). ThirtyDayMapChallenge2020/Maps/20 at main · Sebastian-meier/ThirtyDayMapChallenge2020. GitHub. https://github.com/sebastian-meier/ThirtyDayMapChallenge2020/tree/main/maps/20

Figure 46 FIS-Broker. (z.d.). FIS-Broker. https://fbinter.stadt-berlin.de/fb/index.jsp

Figure 47 FIS-Broker. (z.d.-b). FIS-Broker. https://fbinter.stadt-berlin.de/fb/index.jsp

Figure 49 FIS-Broker. (z.d.-c). FIS-Broker. https://fbinter.stadt-berlin.de/fb/index.jsp

Figure 51 Why living near forests can benefit your mental health. (2020, 7 februari). World Economic Forum. https://www.weforum.org/agenda/2017/10/living-near-forests-is-good-for-your-brain/

Figure 52 Future, A. O. P.-. P. P. A. (2022, 1 april). IS BERLIN a WALKABLE CITY? ArcGIS StoryMaps. https://storymaps.arcgis.com/stories/b7437b11e42d44b5a3bf3b5d9d8211b1

Figure 53 Berlin’s bus lines at a glance | BVG. (z.d.). https://www.bvg.de/en/connections/network-maps-and-routes/bus

Figure 54 TransitDiagrams R. (2022, 12 october). Map of the planned extensions of the Berlin tram system. Reddit. https://www.reddit.com/r/transit/comments/y21u81/map_of_the_planned_extensions_of_the_berlin_tram/

Figure 55 Levy, A. (2023, 27 maart). Berlin’s U-Bahn expansion Plan. Pedestrian Observations. https://pedestrianobservations.com/2023/03/26/berlins-u-bahn-expansion-plan/

Figure 56 Wikipedia contributors. (z.d.). File:Topographischer Netzplan der S-Bahn Berlin.png - Wikipedia. https://en.wikipedia.org/wiki/File:Topographischer_Netzplan_der_S-Bahn_Berlin.png

Figure 58 Hein, S. (2023, 9 januari). Price maps for Germany. Value AG the valuation group. https://www.value-marktdaten.de/2016/03/14/price-maps-for-germany/

Figure 59 Rental prices in Berlin - Vivid maps. (2015, 27 november). Vivid Maps. https://vividmaps.com/rental-prices-in-berlin/

Figure 60 Future, A. O. P.-. P. P. A. (2022b, april 1). IS BERLIN a WALKABLE CITY? ArcGIS StoryMaps. https://storymaps.arcgis.com/stories/b7437b11e42d44b5a3bf3b5d9d8211b1

Figure 61 Figure 3. Distribution of the Social Development Index in Berlin. (z.d.). ResearchGate. https://www.researchgate.net/figure/Distribution-of-the-social-development-index-in-Berlin_fig3_236889313

Figure 62 FIS-Broker. (z.d.-d). FIS-Broker. https://fbinter.stadt-berlin.de/fb/index.jsp

Figure 63 FIS-Broker. (z.d.-e). FIS-Broker. https://fbinter.stadt-berlin.de/fb/index.jsp

Figure 64 FIS-Broker. (z.d.-f). FIS-Broker. https://fbinter.stadt-berlin.de/fb/index.jsp