VISUALISING OUR FUTURE PUBLIC REALM

Development - art and mobility design

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1. INTRODUCTION

In the definition phase, we supported partner workshops and meetings in Helsinki, the early development of a street visualisation tool with Smart Viz and ran a project-based development workshop in London, where we tested a range of potential tools and approaches to neighbourhood green transitions. These included ways of visualising and negotiating shared values, methods for visualising future experiences, tools for creating a library of sustainable patterns as well as the conceptualisation of playbooks to develop and support sustainable communities. These tools were set around an evolving multi-criteria and multi-actor decision support systems that could be used to support decision making in architectural and urban design.
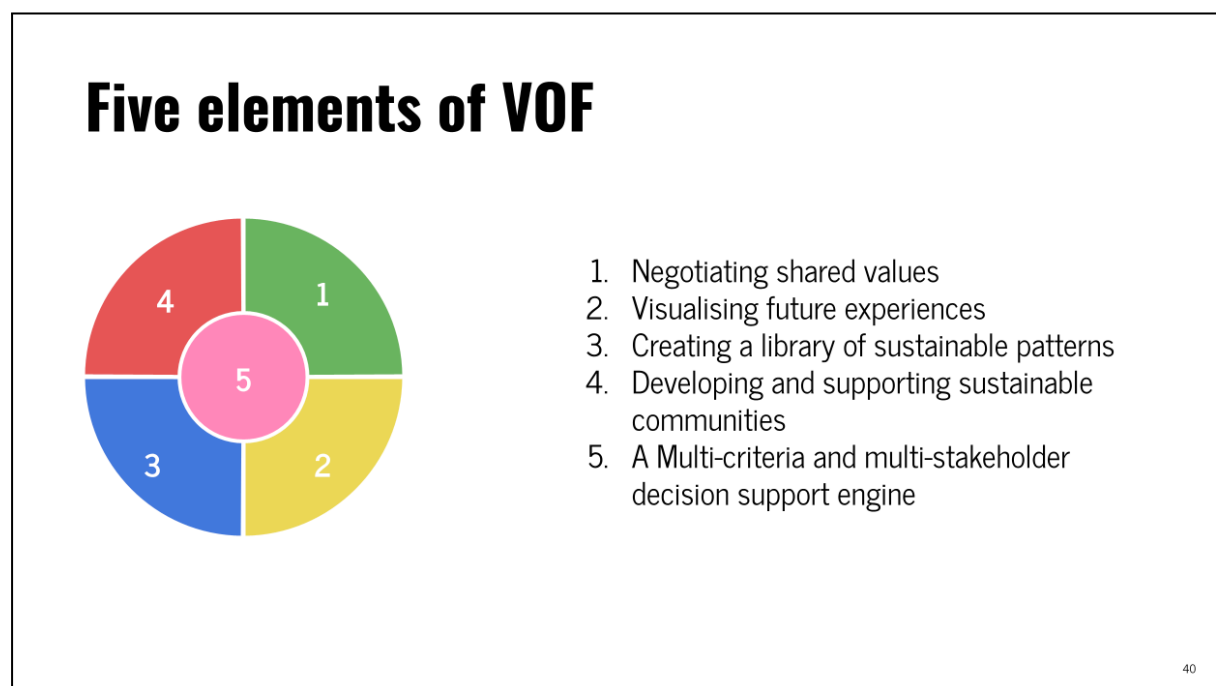

Fig 1: Five elements of a toolkit to help architects and designers visualise and develop our future public realm

Fig 2: Definition workshop with Aalto researchers and Sitowise, Espoo, June 2023

Fig 3: Development workshop with Aalto students and researchers, RCA., London, Sept 2023

This report reflects on the outcomes of the development workshop, considers how our research colleagues in Aalto and Tampere have built on these tools and provides a series of refined design approaches that focus on mobility, urban spatial and service transitions, with a focus on negotiating better values through design, moving VOF to its meta-level and managing the co-creation process with the use of conversational computing and AI systems. These approaches will be tested and developed with Finnish research colleagues in a workshop in March 2024.

2. RCA WORKSHOP OUTCOMES AND INSIGHTS

The RCA workshop asked students of architecture and urban design from Aalto University to develop design responses to the neighbourhood around the RCA's Battersea campus which centres on Ethelburga Estate, a 1960's development that includes 578 dwellings on a 14 acre site.

Fig 4: Site for the RCA workshop held in September 2023

Seven students completed the project and submitted a range of presentations and movies as part of their formal Master's programme. Five came from architectural backgrounds and two from Urban design and planning. During the workshop they were given the opportunity to visit the site, interview stakeholders (including local residents, politicians and the RCA's sustainability manager) and respond to the following activities which they could build on once they returned to Finland:

1. Use the smartviz interface to understand what is possible using a combination of google maps and generative AI.
2. Use the smart viz tool, sketches or other visualisation techniques to develop value-based mood boards that enable a deeper conversation about values and design futures.
3. Use the smart viz tool, sketches or other visualisation techniques to develop knowledge based story boards that enable a deeper conversation about future experiences and how these may deliver or alter the missions that are driving the project.
4. Use the smart viz tool, sketches or other visualisation techniques to develop patterns that can be integrated into the VOF platform to prime the service.

5. Consider how values, stories and patterns can be brought together and how they can support and influence sustainable community development through better use, restoration, maintenance and upgrade of the project site including activities inside and outside the buildings.
6. Consider the decision criteria and weighting that you used to make decisions during the workshop. Discuss how these decisions influenced your design outputs and consider how the decision support engine could be developed to support the quality of architectural solutions.

Visualising our future public realm workshop agenda

	Day 1 - 26/09	Day 2 - 27/09	Day 3 - 28/09	Day 4 - 29/09
AM (10 to 12)	VOF overview (AA, DP) and Smart Viz demonstration + activity 1 (SS)	Designing with stories + activity 3	Designing with patterns + activity 4	Designing with playbooks + activity 5
LUNCH (12 to 2)	Site visit and conversations - values, philosophies and feelings Visit to Ethelburga Tower Resident Association (12:30 to 1:30pm) - Keith Garner - Andrew Thornhill	Site visit and conversations - knowledge & experience Susan Ekins - Ethelburga Residents Association Megan Jones - RCA sustainability manager, (12 to 12:50 pm at IMDC)	Site visit and conversations - imagination and future patterns Tony Belton - Wandsworth Councillor, Planning (12 to 12:50 pm at IMDC)	Site visit and conversations - supporting sustainable change and making decisions together
PM (2 to 4)	Designing with values + activity 2	Designing with stories + activity 3 cont.	Designing with patterns + activity 4 cont.	Designing with decision making + activity 6
PM (4 to 5)	Review and crit	Review and crit	Review and crit	Next steps

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Fig 5: RCA workshop agenda (September 2023)

Following on from the initial workshop, students continued to develop their proposals, using the concept of qualitative evolutionary design (MyCourses, 2023) as a process for 'addressing the increasing complexity of architectural contexts through simple, flexible and self-organising [evolutionary] design and planning solutions'. These qualitative approaches 'aim to improve rather than replace existing infrastructure and provide components that can be freely substituted to improve the design'. Ultimately evolutionary design approaches aim to build on principles of 'adaptive reuse' and oppose 'planned design'.

This approach to design is reminiscent of Alexander's pattern language and suggests that design arises through a network of interdependent modules and relationships.
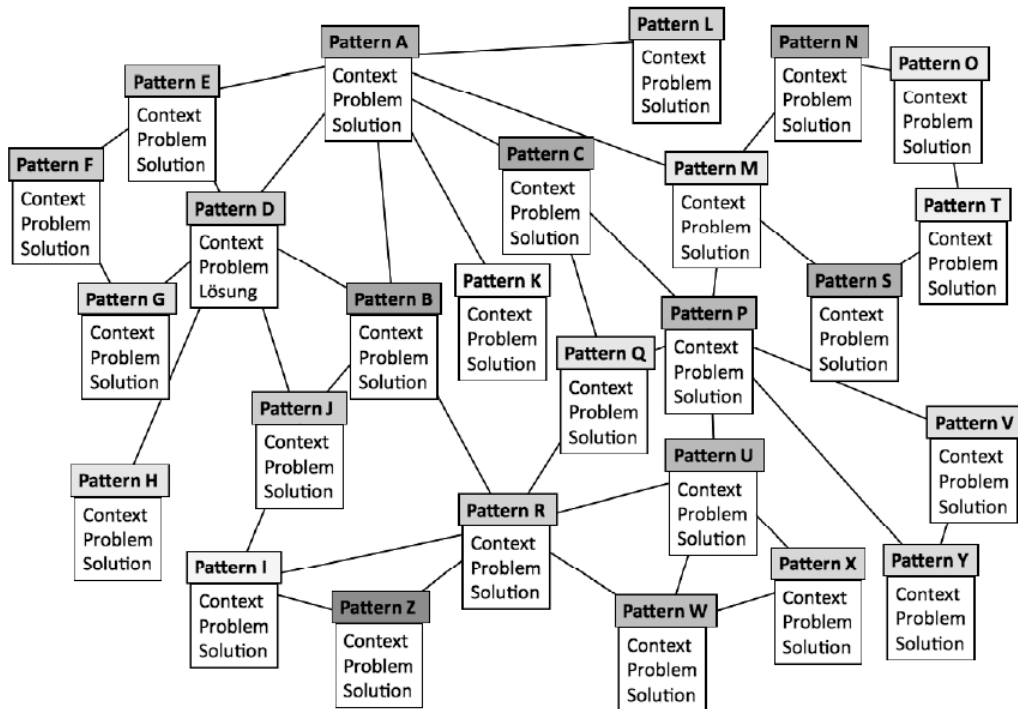
Fig 6: Patterns as a network of design responses to context, problems and interconnected solutions P2P Foundation. (n.d.)

The challenge of developing and evolving architectural patterns in a new cultural context - the anthropocene (Nikoleris et al., 2019) - is that successful patterns from our tribal and industrial pasts may no longer be appropriate, but our communal and social values, emotions, knowledge, experiences, productive and inhabited environments may still be constrained by anthropocentric mindsets (Søgaard Jørgensen et al., 2024).

With that in mind, we now review student proposals and provide some insights that may help to develop a culturally sensitive and digitally assisted methodology for 'qualitative evolutionary design'.

STUDENT OUTPUTS

Participant 1 (CE) made use of value responses from stakeholders to identify interconnectedness as a key theme for design. They analysed routes, intersections and plazas as places for interconnection and used mapping and AI generated visualisation tools to imagine how these spaces might change. For each space they considered a variety of spatial qualities including nature, engagement, amenities, legibility, accessibility and safety, scoring each aspect depending on its current and potential states (Ewing & Handy, 2009). The final proposal can be considered as a 'playbook' that explains the way in which the design responds to community values, identifies key areas for improvement, takes inspiration from places that respond to flooding through design and suggests how the external environment can adapt to create a more interconnected and resilient place to live.

Fig 7: Participant 1 key principles, scoring and axonometric solution

Participant 2 (ER) asked us to imagine a place where we lived 'in common' and where we might live without endless consumption. They identified communality, mixed-use development, pedestrian-friendly development, public property, inclusive design and cultural identity as enabling factors and used prompts and AI visualisation as tools to quantify

different approaches to public space design, developing design extensions and modifications to the public realm to support communal spaces, urban greening and densification.

Fig 8: Participant 2 mapping, densification and visualisation

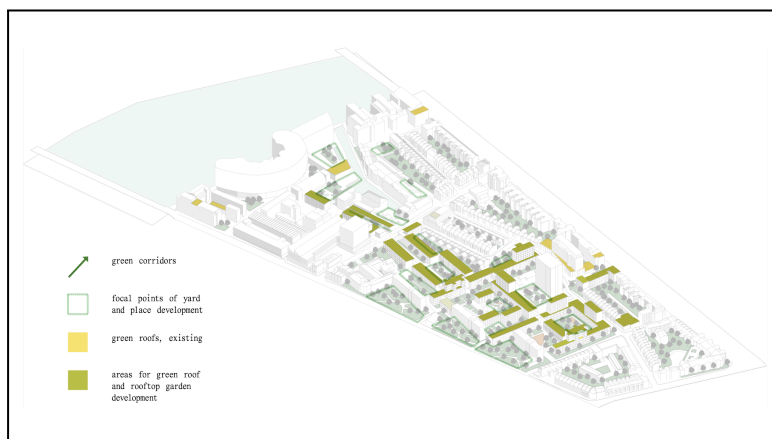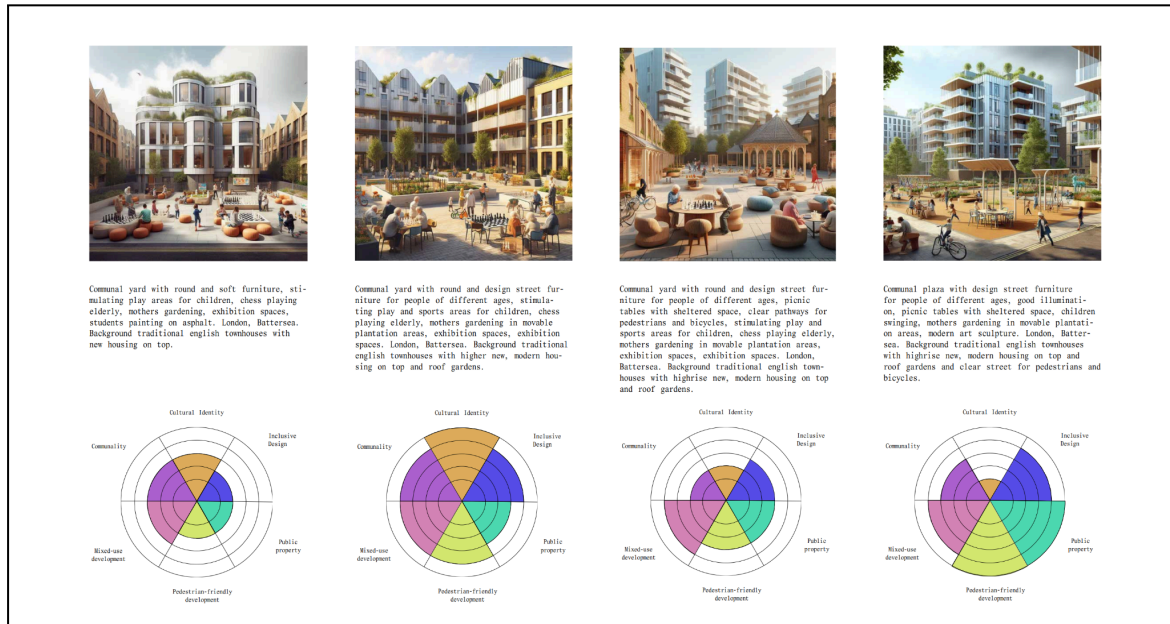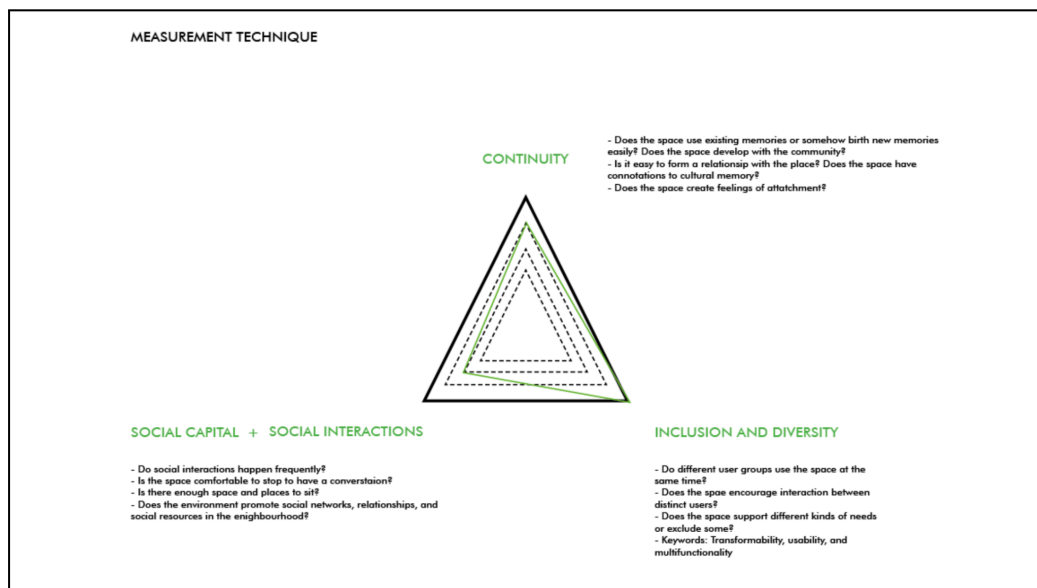Participant 3 (GO) investigated the greening of the public realm, setting goals to achieve carbon neutrality, halt the decline in biodiversity, improve livability and promote healthy living. They built their argument around TEEB's Manual for Cities, acknowledging that ecosystem services are often seen as nature-based technologies rather than elements of value in human life (Ernstson & Sörlin, 2013). Key metrics included resilience to climate change and flooding, overall well-being of people, physical activity, sense of belonging, resilience and livability (Wachsmuth & Angelo), accessibility without barriers (Green & open spaces), bondness among residents, place-based activities and people's necessities and values.

Participant 4 (LK) developed a proposal for social and cultural continuity based around caring for the present while welcoming future life. They did this by creating pedestrian-friendly environments, spontaneous encounterings, diverse land-use and mixed-use buildings. This was inspired by work by Juliet Davies on caring cities (Davis, 2022) and Alexandra Lange's research on 'designing childhood' (Lange, n.d.).

MEASUREMENT TECHNIQUE

CONTINUITY
- Does the space use existing memories or somehow birth new memories easily? Does the space develop with the community?
- Is it easy to form a relationsip with the place? Does the space have connotations to cultural memory?
- Does the space create feelings of attatchment?

SOCIAL CAPITAL + SOCIAL INTERACTIONS
- Do social interactions happen frequently?
- Is the space comfortable to stop to have a converstaion?
- Is there enough space and places to sit?
- Does the environment promote social networks, relationships, and social resources in the enighbourhood?

INCLUSION AND DIVERSITY
- Do different user groups use the space at the same time?
- Does the spae encourage interaction between distinct users?
- Does the space support different kinds of needs or exclude some?
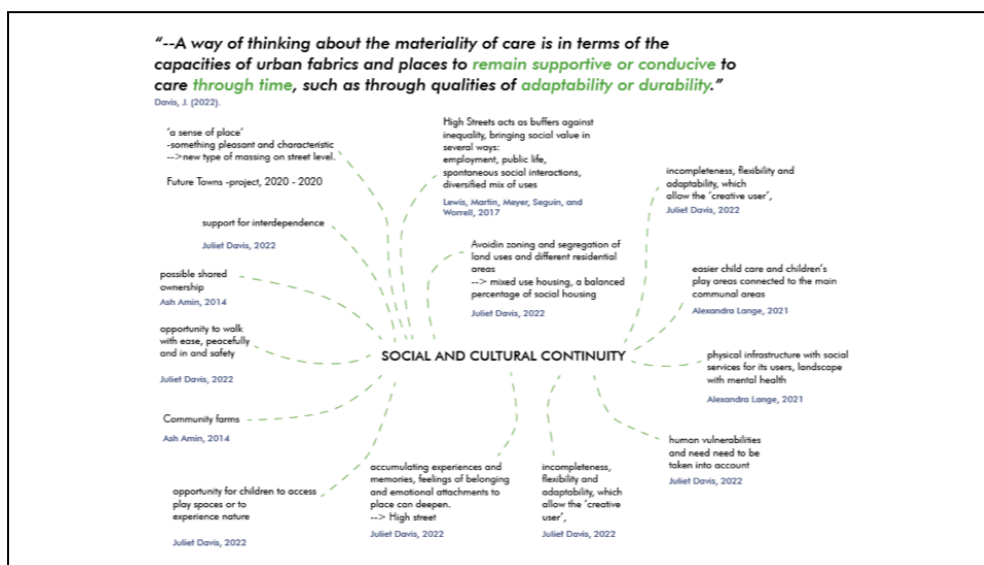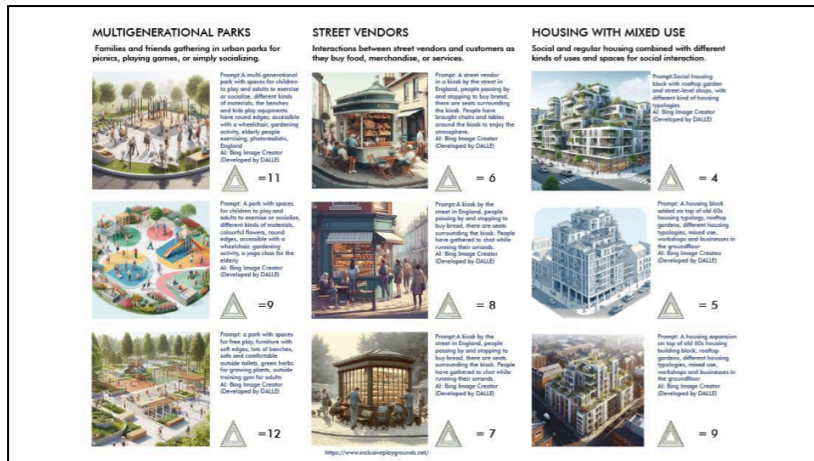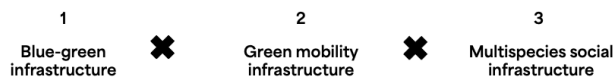- Keywords: Transformability, usability, and multifunctionality

Fig 9: Participant 4 measurement,, visualisation and references

Participant 5 (KK) reimagines the urban realm through infrastructure. They identified 'safety, lack of respect, carelessness and potential flooding' as key issues to engage with and designed responses through blue-green, green mobility and multispecies social infrastructure. Themes included interaction, learning, recreation, safety, isolation and active living. The design solutions included spatial responses for different outside courts around the estate that suggested a shift in urban design principles, amplifying inclusivity, biodiversity, resilience, interconnected ecosystems, active and eco-conscious living and preparedness for environmental challenges.

- Safety
- Lack of respect
- Kids playing around carelessly
- Unattended scooters
- Probability of flooding
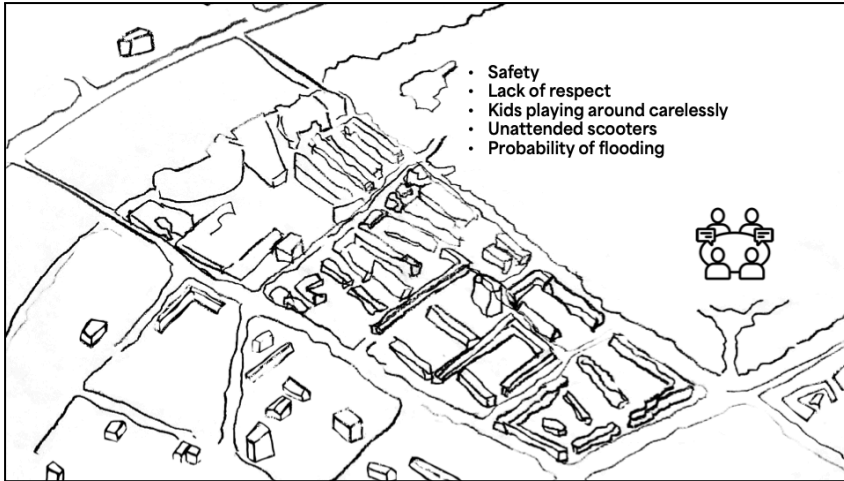
Infrastructural qualitative subtopics:

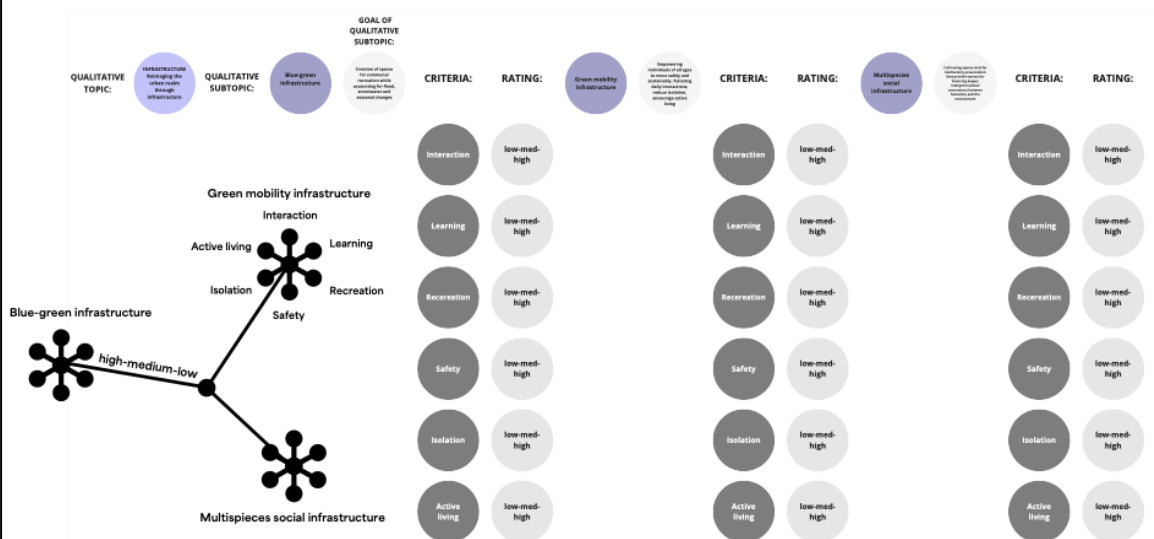| 1		2		3
Blue-green infrastructure	✖	Green mobility infrastructure	✖	Multispecies social infrastructure

Evolutionary criteria:

Fig 10: Participant 5 values, infrastructure, evolutionary themes and courtyard interventions

Participant 6 (EH) identified a strong desire to maintain and support the social mix of the neighbourhood in the face of gentrification in high value neighbourhoods. They imagined that a 'perfect collaboration of administrative policies and architectural practices could make this happen'. Administrative policies included rent controls, resident and community support and developer related options. Architectural practices included participatory and research-centred design, development of key features and forms, and a focus on communal and equal spaces. Key principles included quality, equity, sociability, prevention and maintenance, which together would strengthen the social bonds between neighbours and enable a move towards community-led development.
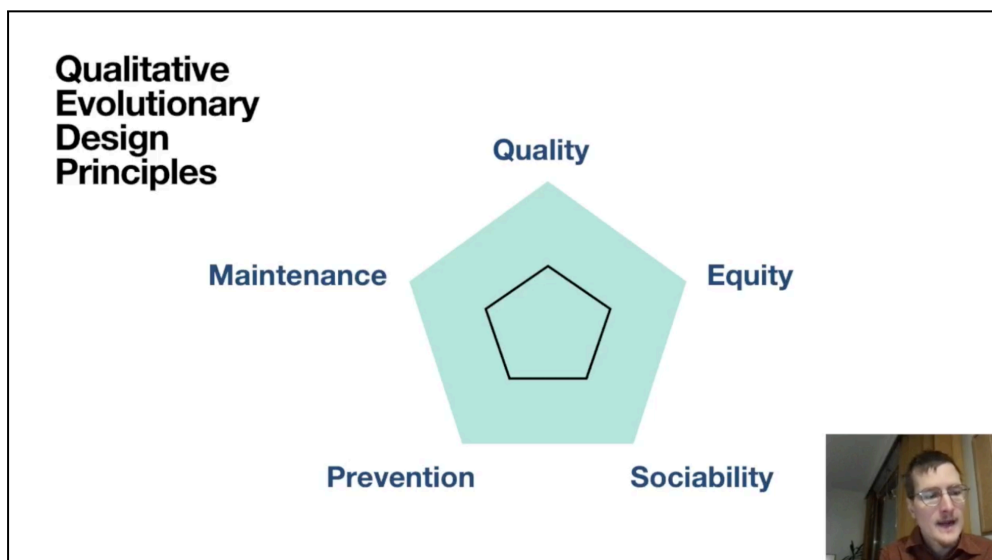
Fig 11: Participant 6 design principles to support social mix

Finally, participant 7 (AS) built the case for a focus on materials and water by looking at London and Battersea's ongoing relationship with the River Thames and wider flows of energy, material and waste. The project specifically developed a 'recycling and material reuse' centre adjacent to Ransome Docks in the north of the site. While the aspirations for a more harmonious relationship with materials is new, there is an existing riverside waste and recycling centre along the river which handles 171,000 tonnes of local trade and commercial waste and recycling every year.
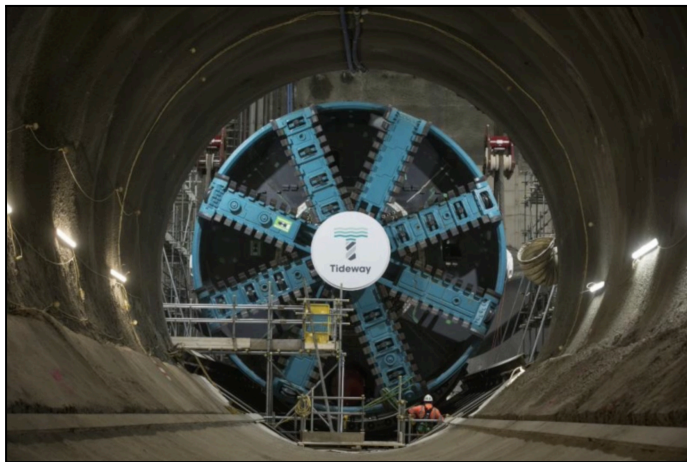
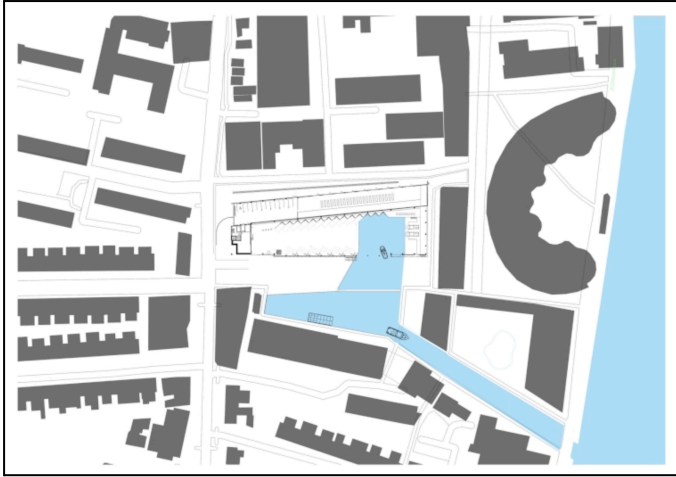Fig 12: Participant 7 looking at the history and future of London through water and waste.

INSIGHTS

Participants approached their design studies through different lenses and did not utilise all of the tools and methods that we presented at the start of the workshop. Nevertheless we can draw a number of insights that reinforce, improve or suggest new ways that architects can use these different approaches to qualitative design for the green transition.

1. LISTENING AND LEARNING FROM YOUR COMMUNITY

Whose voice was included and who was excluded? How were stakeholders brought to life?

Students used their research to understand some of the stakeholders associated with the neighbourhood but didn't design outcomes around all the residents or needs of this diverse community. Opportunities to expand and deepen empathy include the development of digital approaches to human-centred design (Wang & Masood, 2020), embedding inclusive design approaches into early stage design (Eikhaug & Gheerawo, 2021) and developing personas and scenarios to highlight current experiences and future solutions (Tvedebrink & Jelic, 2018). While generative tools can speed the development of these approaches it is important to be aware that many AI models are built on biassed data sets and prompts (Ferrara, 2023). We can also explore how different forms of visual representation enable a range of objective, subjective and abstract understanding of people and activities (Peterson et al., 2023).

Fig 13: A sketch persona in Midjourney for a future citizen based on green transition hopes and behaviours.

Fig 14: Innovating with people using an inclusive design approach

Fig 15: An edited reproduction of McCloud's 'Big Triangle' design space of visual iconography

2. BUILDING ON LOCAL NETWORKS AND RESOURCES

Which networks and resources were included and how were they visualised and valued?

Students were provided with a set of networks and resources that the neighbourhood is supported by representing social, cultural, environmental and technical community infrastructure.

Network and resource map

Ethelburga Estate (Central Node)
- Residential and commercial buildings
- Local amenities and facilities

Local Community (Connected Node)
- Residents (diverse demographics)
- Community centers and organizations
- Local schools and educational institutions
- Healthcare facilities (hospitals, clinics)

Local Resources (Connected Node)
- Parks and green spaces
- Local markets and shops
- Restaurants, cafes, and food establishments
- Public transportation hubs (bus stops, train stations)

Wider City (Connected Node)
- Other neighborhoods and districts
- Landmarks and cultural institutions
- Major transportation routes (highways, main roads)

Local Businesses (Connected Node)
- Small and large businesses within the estate
- Offices and co-working spaces

Transportation Network (Connected Node)
- Public transportation routes (bus lines, train services)
- Cycling lanes and bike-sharing stations
- Roadways and pedestrian pathways

Utilities and Services (Connected Node)
- Water supply and sewage systems
- Waste collection and recycling facilities
- Energy infrastructure and providers

Green Infrastructure (Connected Node)
- Green roofs and vertical gardens
- Rainwater harvesting systems
- Urban farming initiatives

Educational and Cultural Institutions (Connected Node)
- Museums, art galleries, and cultural centers
- Libraries and educational facilities
- Universities and research institutions

Public Spaces and Gatherings (Connected Node)
- Ethelburga Estate central plaza or square
- Playgrounds and recreational areas
- Community events and festivals

Community Services and Support (Connected Node)
- Social support organizations
- Job training and employment services
- Homeless shelters and support groups

Environmental Initiatives (Connected Node)
- Local environmental groups and initiatives
- Sustainable development organizations
- Recycling and waste reduction programs

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Fig 16: Suggested network and resources for Ethelburga estate

Students used this to a certain extent but focussed on key aspects that came out of their interviews and the wider project briefing. The networks they researched included residential buildings, roads and paths, green and blue infrastructure, waste and recycling and the use of public space. They didn't engage with wider technical networks of mobility and power or consider changes to broader community and cultural services.

An opportunity for the future could include a digital platform to help architects analyse social and technical data about local networks and resources (Mondejar et al., 2021). An example tool was developed by Dustin Carlino et al. to analyse 15 minute accessibility (A/B Street, n.d.) and other transport related planning activities but these could be reimagined to create more qualitative information that relates to social sustainability metrics such as health and wellbeing, social interaction and participation, flexibility, architectural identity and sense of security (Lami & Mecca, 2020).
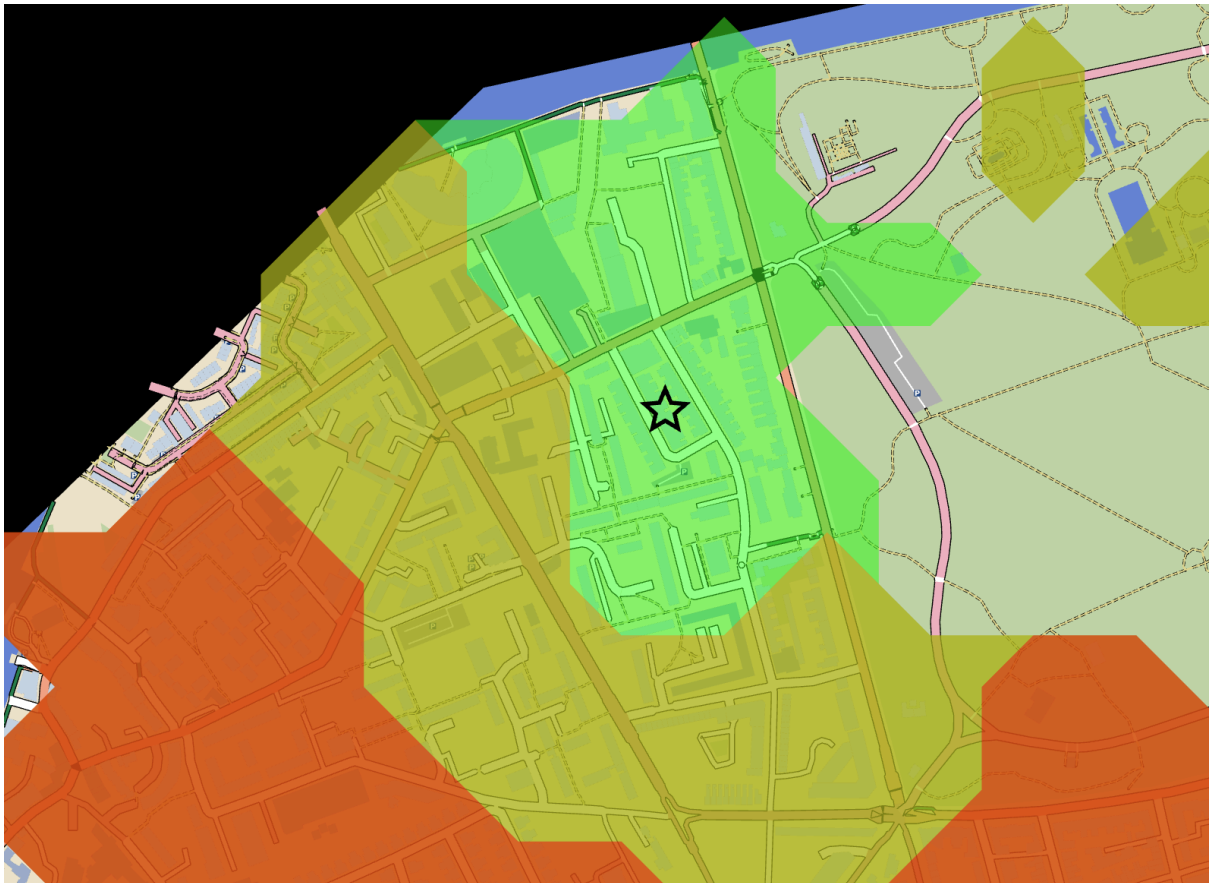
Fig 17: Mapping 15 minute city accessibility around Ethelburga estate using A/B streets

3. CONNECTING MODELS AND MISSIONS

Which missions and models were used and how were they chosen or validated?

VOF strives to support the green transition through a number of interconnected models and missions, relating both to UN sustainable development goals and to principles of sustainable urban planning that include circularity, cultural equality, health and wellbeing, inclusive design, net zero, resilience, restorative design and service-orientation.

Participants included concrete and quantifiable outcomes in their projects including carbon neutrality and resilience to flooding but also qualitative ambitions such as interconnectedness, communality, social and cultural continuity and community-led development. They attempted to score the current and future levels of these qualitative measures but the choices of mission, visualisation approaches and scoring methods were not highly developed or focussed on baseline sustainability challenges.

One possible tool to help architects and designers develop quantitative and qualitative missions and goals, and to go beyond technically oriented approaches to planning checklists, is a decision-support system that reflects the ongoing challenge of achieving inclusion, equity, environmental sustainability and universal health and wellbeing in urban

design.[1] Advanced visualisations could communicate complex ideas and help to develop a deeper understanding of the interconnections between ecological, communal and generational aspects of sustainable development.
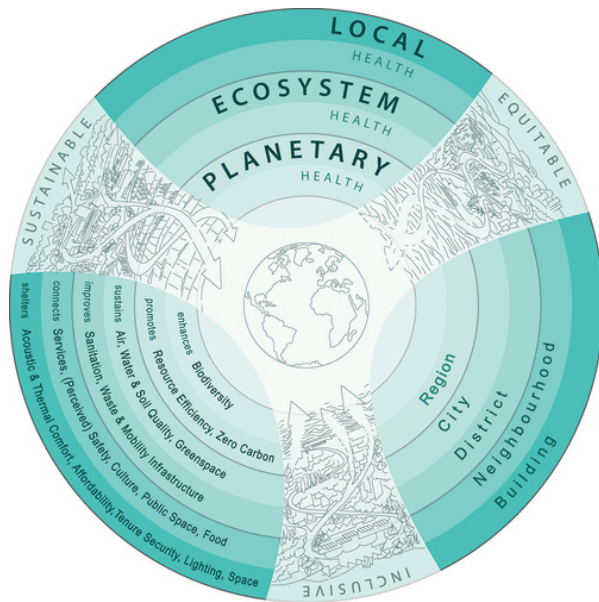

Fig 18: The THRIVE model attempts to provide a framework for inclusive, equitable and sustainable urban design but doesn't identify the design qualities associated with this future (Pineo, 2022).

4. VISUALISING VALUES

Which values underpinned design direction and how was the link between values and practices made tangible?

We offered students a range of approaches to engage with community values including reference to Schwartz's theory of basic values (Schwartz, 2012), a simplified version based on RCA's work on culturally sensitive design and reference to brand archetypes (Merlo et al., 2023) that came from Aalto's perspective on design outlooks.

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[1] Pineo, Helen. "Towards healthy urbanism: inclusive, equitable and sustainable (THRIVES) – an urban design and planning framework from theory to praxis." Cities & health 6.5 (2022): 974-992.
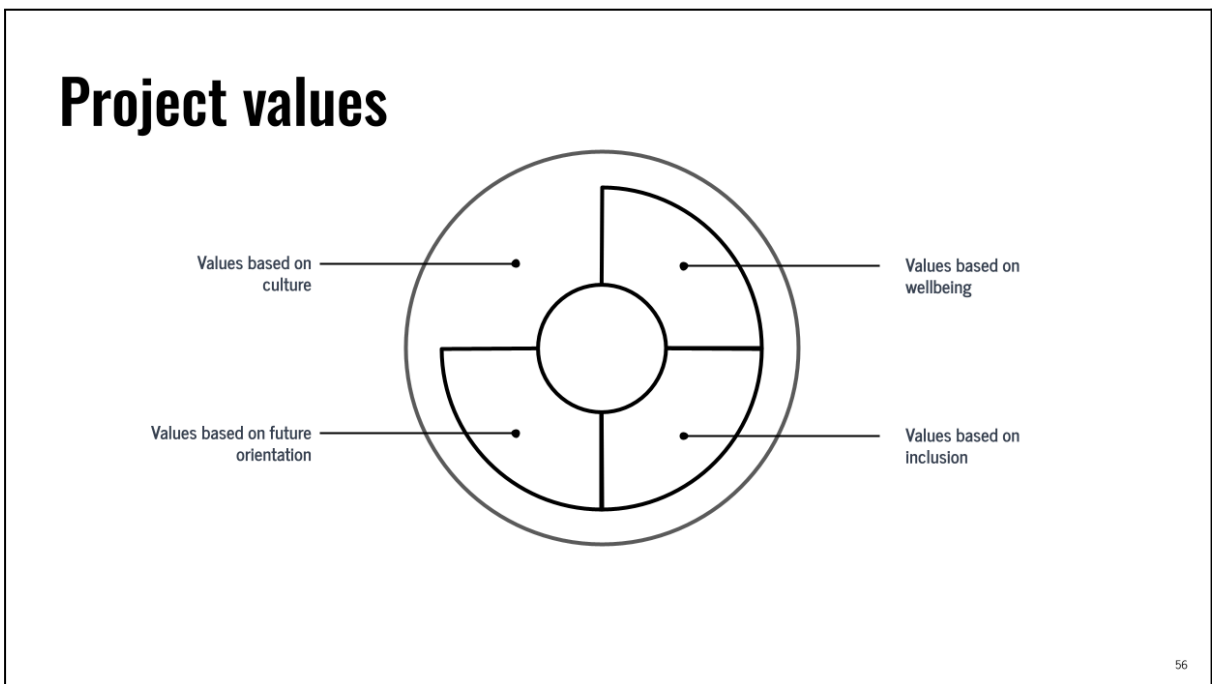
Fig 19: Models of value sensitive design

Fig 20: A simplified perspective on human values

Fig 21: Mapping brand archetypes

Students identified values either through their interviews with local stakeholders or through their choice of models and missions. Their approaches sat, predominantly, within value concepts like universalism, benevolence, tradition and security rather than power, achievement, conformity and hedonism. Students didn't attempt to visualise this wider set of values or use these wider value-based approaches to measure their qualitative topics against.
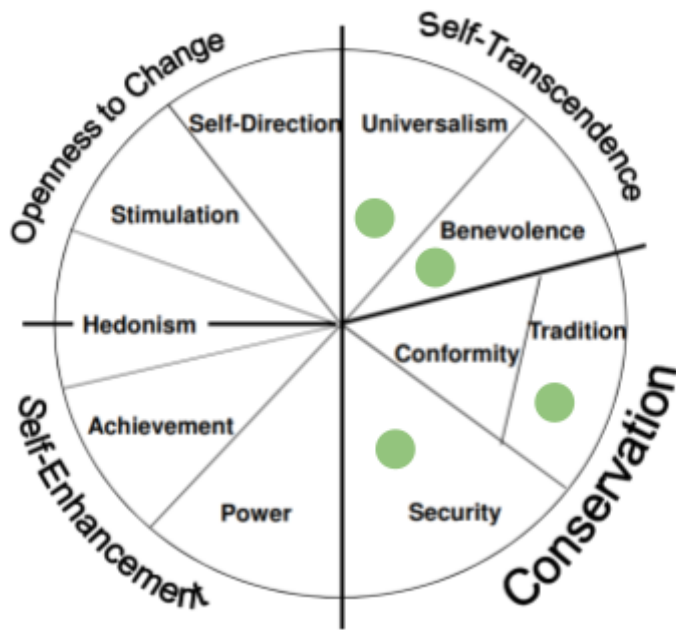
Fig 22: Student project values against Schwartz's cultural dimensions

Fig 23: Connecting Schwartz cultural dimensions to activities through visualisations of different mobilities (Midjourney visualisations)

The connection between design practice and values can be seen through the development and support for new and existing 'rituals', 'heroes' and 'symbols' which ultimately translate into new ways of behaving and interacting in our environments. This approach can be seen in evolving design practices that look at urban transitions through a value lens with projects like Our Cluj mapping interdisciplinary design practice through 'imagining, remembering and sharing' rather than through data and metrics alone (OurCluj, n.d.).

Fig 24: Activating values in urban transitions - case study from Cluj

5. GREEN TRANSITION NARRATIVES

What narratives were developed and what techniques were used to bring these stories to life?

Students developed a range of narratives covering social, environmental, economic and technological themes. They included community engagement and inclusive spaces, ideas around community led development, social equity and cultural continuity. These were brought to life through a combination of written or spoken narrative, combined with plans and 3D visualisations that focussed on architectural concepts such as residential extensions, walkable routes, urban greening / flood management and new interstitial rooms and courtyard spaces. The visuals showed points of view and moments in time and rarely focussed on specific residents, relationships or productive activities.

An opportunity for development includes greater focus on journeys and everyday stories of residents and other neighbourhood actors showing how they might live together in these future models of green urban life and engage with the new green infrastructural systems. This can be developed both through a narrative approach to design (Austin, 2020) and through the use of cinematic techniques in architectural practice (Lum, 2019).

Pallasmaa's work on 'architecture as a verb' also points to the need to move architectural discourse away from the form and object to the actions and relationships which, in the context of narratives, moves us away from the technologies of the green transition to the experiences and relationships that are enabled by this transition - ways of nurturing, playing, learning, moving, transacting, powering, growing and caring for and with each other and the world around us (Pallasmaa, 2024).
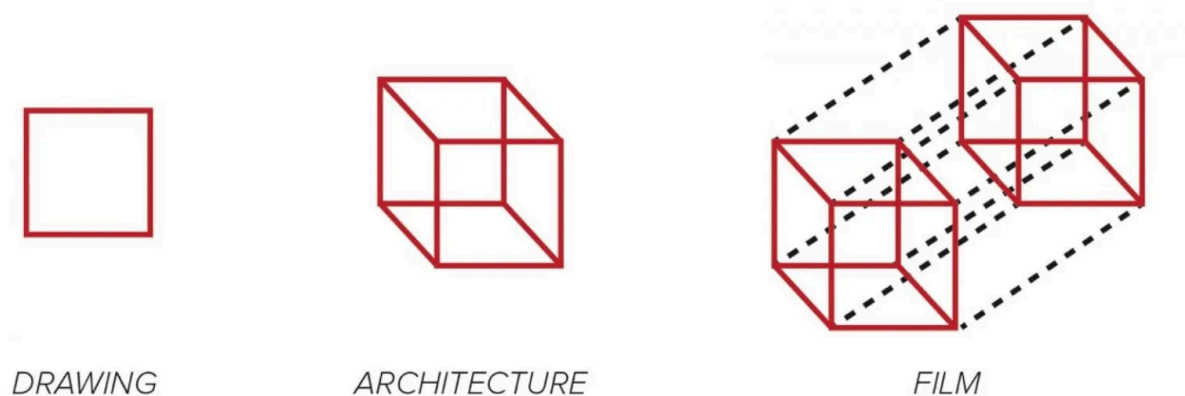

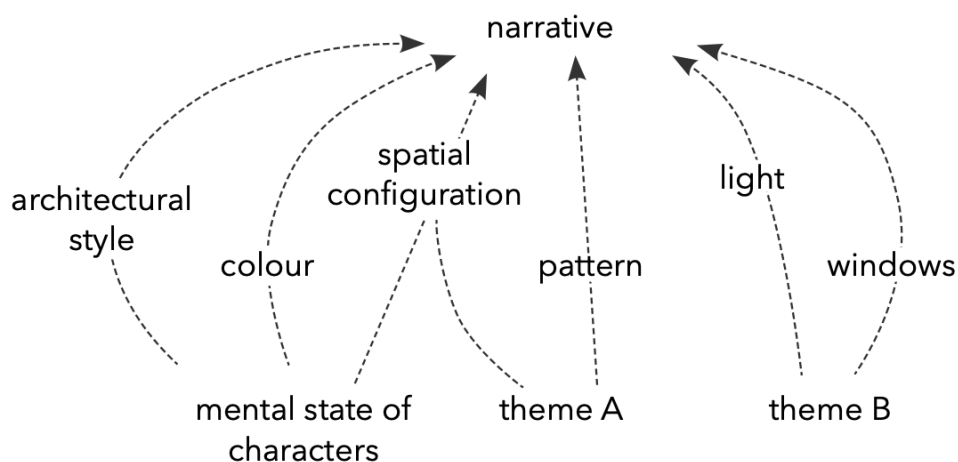Fig 25: Architecture as a bridge between drawing and film.

Fig 26: Juhani Pallasmaa's description of how visual narratives are created in film

6. PATTERN LANGUAGE FOR EVOLUTIONARY DESIGN

During the London workshop, students were introduced to the use of pattern languages (Alexander, 1977) as a way of formalising the evolving relationship between urban and architectural problems and solutions through qualitative derived and physical design solutions. While pattern libraries in architectural and urban design evolve at a relatively slow pace (Mehaffy et al., 2020), patterns in other media are constantly being invented, shared, tested and evolved (Pauwels et al., 2010).

While students identified a range of missions and design solutions that might support different aspects of the green transition, there was little evidence that these patterns were being formalised into a set of interconnecting and modular approaches. While this shows that pattern reuse, identification and making is not necessarily an intuitive or natural part of today's architectural practice, there is evidence that these approaches can be of value for approaches to architectural and urban design. Felstead and Thwaites, for example, examined the use of patterns in cohousing and identified a wide range of potential design patterns to support both the design process and the spatial design outcomes (Felstead & Thwaites, 2023). The 72 patterns included solutions for establishing a vision, making decisions, creating resources, occupying spaces, working with others, design of spaces, as well as tools to help practitioners deliver cohousing projects. Pattern 51 (Restricting cars), for example, describes a solution to minimise cars on-site by spatially locating car parking towards the edge of the site, establishing social norms for reducing car use, and organising policies on car-sharing and ownership.
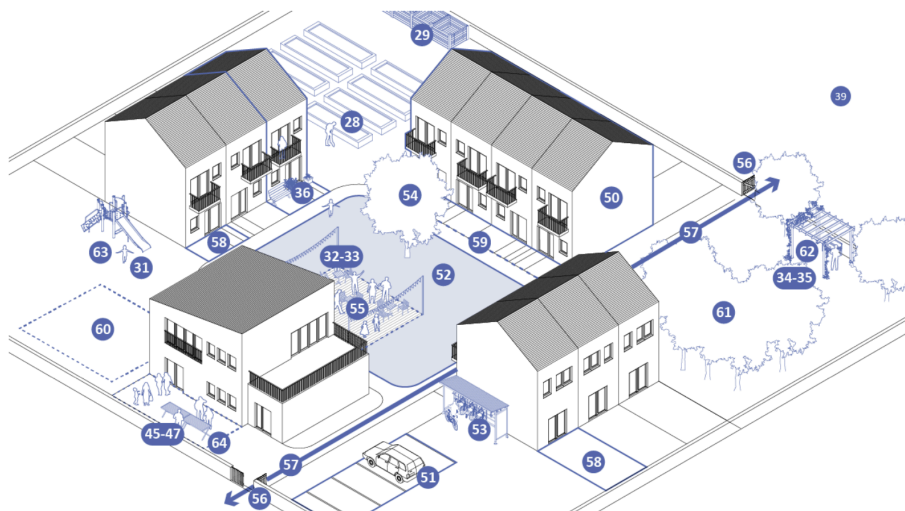

Fig 27: Spatial patterns of resident participation mapped onto a diagram of a typical cohousing development (Felstead & Thwaites, 2023)

These patterns show how the concept of pattern making can extend beyond the material and visible elements of design to include patterns that might support the whole design process as well as on-going use and maintenance of space.

This pattern-based approach could lead to the development of a range of solutions that architects can use to support the green transition at different stages and different scales. In sustainable mobility design for example, these might engage with evolutionary concepts found in the nature of order (Alexander, 2004) - scales, centres, boundaries etc - but also with different actors and relationships - for children, families, businesses, nature -, forms - active, shared, inclusive and electric- , journeys - commuting, shopping, educating - and spaces - paths, streets, squares, parks and green spaces, parking, charging, hubs and nodes- , each with their own solution spaces and interconnections.

7. PLAYBOOKS AND THE LANGUAGE OF SERVICE-ORIENTED ARCHITECTURE

Students had limited time to consider how their proposals might develop and evolve over time and how multi-actor community led development might be supported. Nevertheless many of the presentations included historical and spatial context, logic around principles for development, example case studies, design approaches and qualitative assessment as well as visualisations of proposed interventions. These methods could be combined to create an adaptable template that allows architects to develop their own guides for sustainable community development, bridging the gap between community action and traditional building or neighbourhood operation manuals.

We could build on these and give architects and urban designers a set of instructions for developing green transition playbooks that include strategies and best practices, historical and spatial context, principles for development, example case studies, design approaches, qualitative assessment methods, ways of visualising narratives and interventions at different scales and across different forms of development together with community engagement strategies, implementation plans and methods for evaluating and adapting plans over time.

3. VOF TOOL DEVELOPMENT

Colleagues in Finland have been developing and testing responses to the VOF tools through a series of workshops and a figma wireframe that brings together early design ideas with feedback from architectural practices.
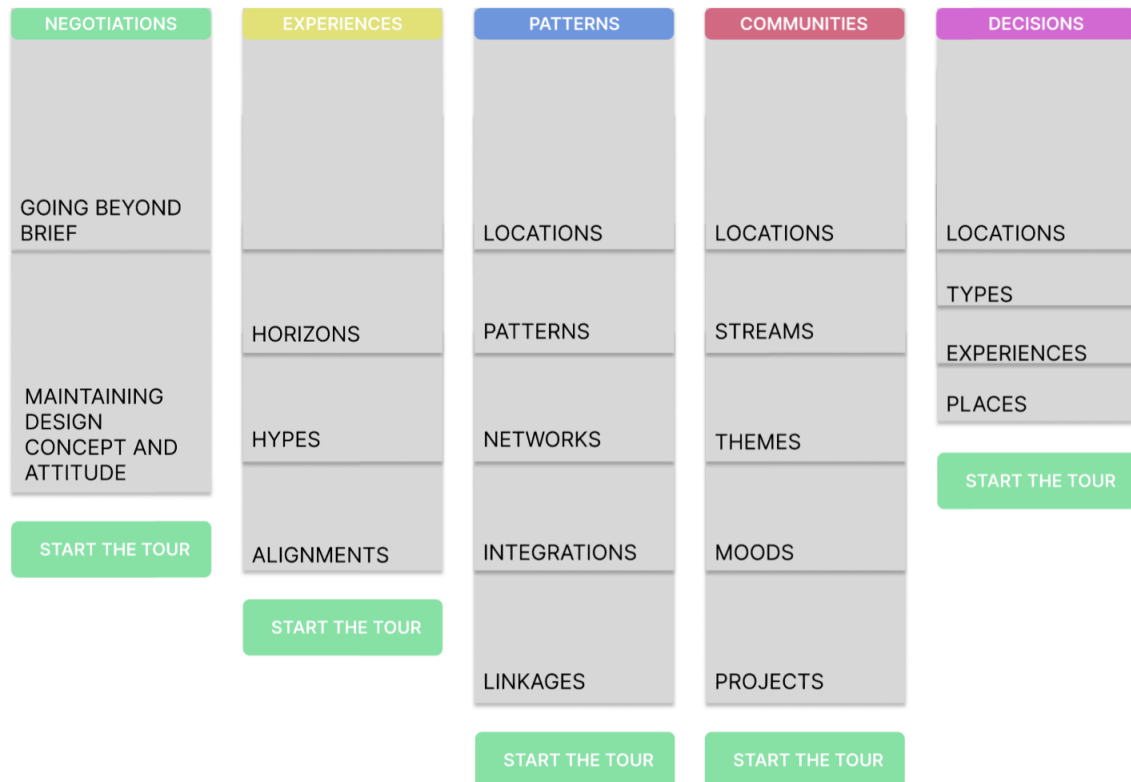
Fig 28: Summary of VOF tools developed by research team

In 'Negotiating shared values', the team focused on 'going beyond the brief' and 'maintaining the design concept and attitude'.

'Going beyond the brief' aims to question the client's / users' needs and replace them with 'what this should really want'. In this section architects can choose between 'material sustainability' and 'immaterial sustainability' and research different auto-generated responses. The 'auto-generation' tools use concepts like making sure that sustainable facilities have enough users, making new sustainable spaces with low usage, calculating efficiency per square metre, emphasising sustainability in new building technology etc.

'Maintaining design concepts' aims to help architects to generate differentiating and unique selling points or develop their communication skills. Differentiating approaches include; identifying shared attitudes and realising shared fantasies; expanding the horizon of possibilities; creating tailor-made typologies; making difference and avoiding becoming automatised contextual generation of additions to environment. Communication skills include: controlling expectation management and explaining how informed decisions are made; avoiding simplification of different types / groups of people; creating solutions that bring long- term benefits that are presently excluded; elevating the discourse into mutually benefitting reciprocity; redefining the extents of the community to include presently excluded; and explaining how we will take into account the uses and users in the future.

While these concepts point to ambitions of creative exploration and communication, it's not clear how they support a structured approach to value based negotiation or the use of visualisation methods to bring value-based concepts to life. Returning to concepts of value-sensitive design as methods for articulating underlying human values together with the use of visualisation methods like moodboards that help to bring philosophical intent and mental paradigms around the green transition to the fore. These value concepts can either use the frameworks described in workshop outcomes (Schwartz value framework, brand archetypes) or build on social-cultural dimensions developed by Hofstede, perhaps focussing on the unique cultural outlook of Finnish society as a starting point for value-sensitive design.
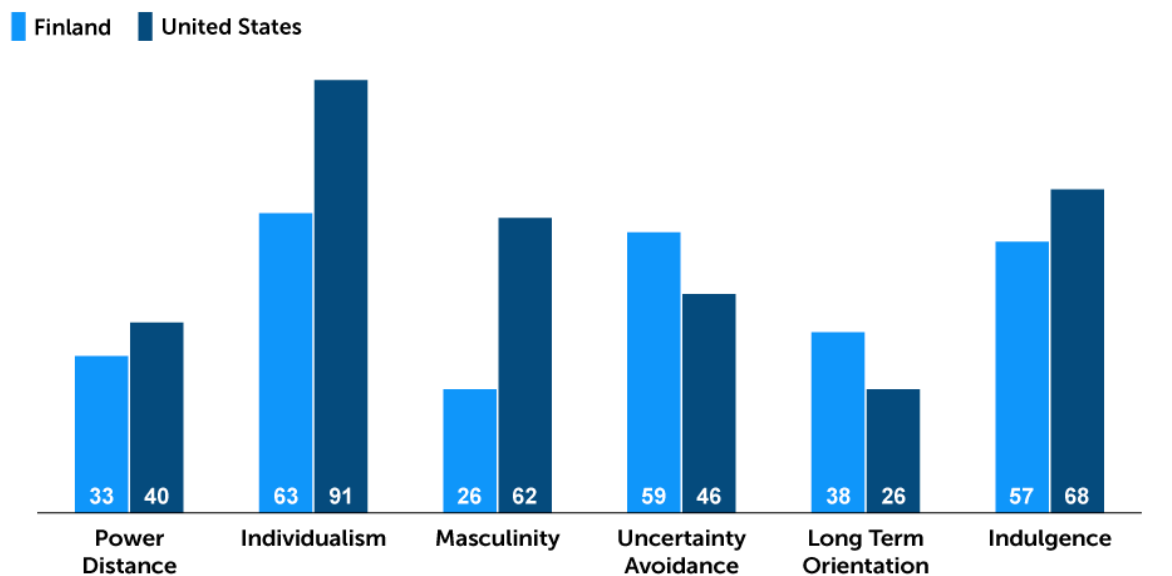
SOURCE: HOFSTEDE INSIGHTS

Fig 29: Comparing Finland with the United States using Hofstede's dimensions (Valamis, n.d.)

Fig 30: A midjourney derived moodboard highlighting visual elements that foster gender equality and inclusivity within Helsinki's transportation infrastructure and public spaces. (Midjourney, n.d.)

An alternative approach to value-based negotiations is to focus value-sensitive conversations and visualisations around goals and behaviours as mapped by Vauclair et al in their meta analytical replication of Schwartz's value orientations (Vauclair et al., 2011). Here, terminal values like "sisu" (perseverance in the face of adversity) and "onnellinen" (meaningful contentment), and instrumental values like "reilu peli" (fair play) and "luottamus" (trust) can be used to visualise preferable futures and enable conversations about their meaning and value to urban design.
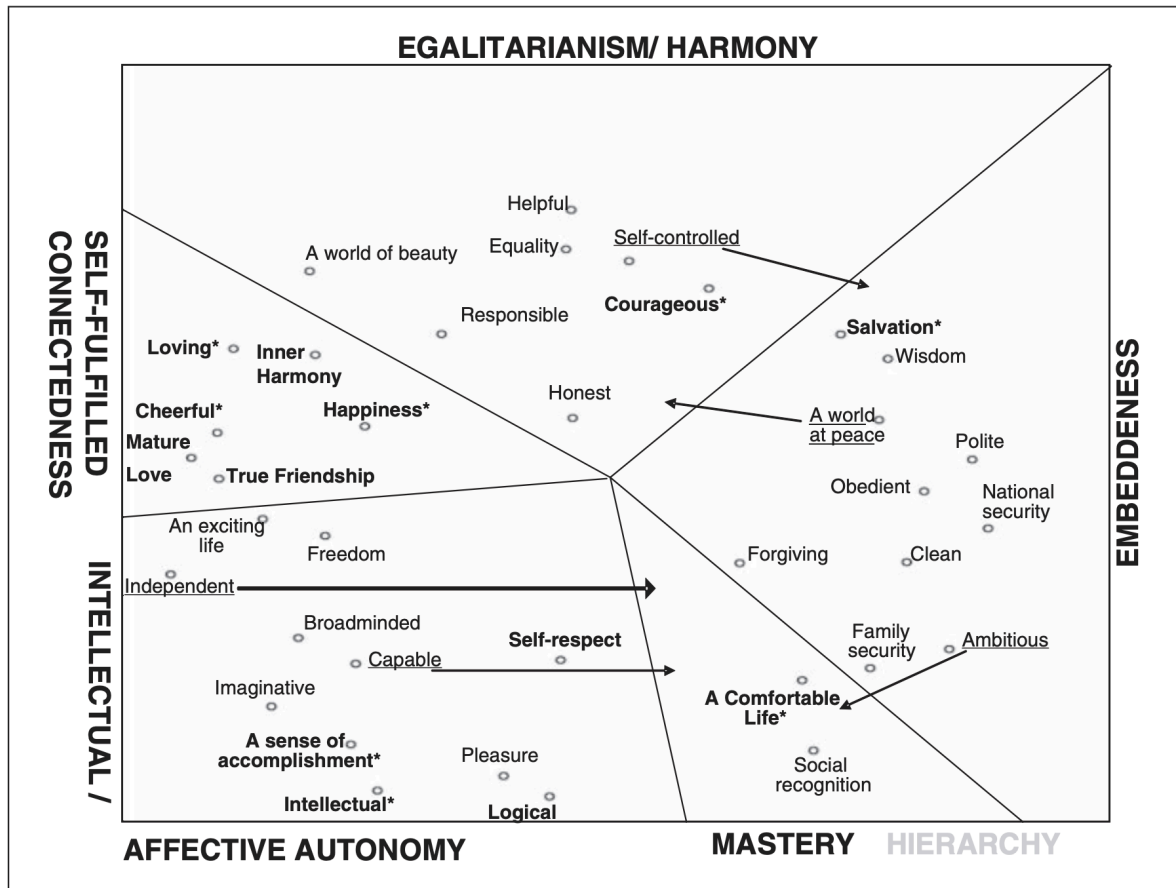
Fig 31: Mapping Rokeach's enduring beliefs through goals and behaviours

Fig 32: A midjourney derived mood board that illustrates the spirit of "sisukas" in Finnish urban design by depicting resilient infrastructure, robust public transportation networks and empowered communities overcoming challenges together.

In visualising future experiences, the team use locations, horizons, hypes and alignments as methods to storyboard or animate spatial concepts. These approaches imagine how digital maps and street views can be linked to prompts and place-based social intelligence in order to generate AI assisted scenes and animations via 2d, 3d and film-based ML platforms such as Sora (OpenAI, n.d.). It is unclear how the map to text to image visualisation is intended to work although the original premise of this theme was the desire to move architectural design away from object-oriented spatial programming to experience-centred design, with a specific focus on the rituals, stories and icons that green transition design might support. In mobility design, some of these rituals are already embedded in Finnish urban planning - e.g. school children walking or cycling to school in midwinter or the use of electric trams to connect

metros to local campuses. These concepts could be visualised as part of the design process and shared with stakeholders as part of the evolutionary design process. They may be more useful if these storyboards are connected to site data as suggested in the framework.

Fig 33: A future green transition story generated with midjourney showing a young child cycling safely to school in midwinter with consideration of each step in the journey, use of future technologies and the development of the social and cultural infrastructure to make it happen.

In sustainable patterns, the team conceive of a growing collection of reusable and modular approaches to spatial design that build on patterns identified by design researchers. The patterns respond to green transition challenges from both technical and social perspectives and provide tools to help architectural practitioners store, mix and reuse their own pattern languages. The patterns that are revealed are based on issues like, "Is full ownership of the space required?", "Are there available structures on the site that can be integrated into a new structure?", "Can the solution be integrated with the existing built environment?". Whilst these are intriguing questions they feel abstract and distant from the wider context of the green transition and the missions that VOF aims to achieve. How can we focus patterns around green transition challenges and ensure that these support Finnish approaches to architectural and urban design?

Again, Finnish culture may lead to new patterns of urban design from "onnellinen squares" that foster meaningful contentment or "Sisukas pathways" that provide safe and inclusive routes for pedestrians and cyclists to navigate the urban landscape in all weathers.

Fig 34: A green transition pattern - Onnellinen square - based on a sketchnote from midjourney showing how green and blue infrastructure helps create community through cultural events and spaces for relaxation.

The final theme, 'supporting decision making in architecture by qualitative evolutionary design', looks at evolutionary design through lenses of interconnection, social interaction, spatial programming and urban greening with each theme represented by alternative solutions such as 'indoor vs outdoor', 'biodiversity vs ecosystem services'. Are these the right themes and dipoles to consider for this decision making topic or do we need to relentlessly pursue the broader questions of transition design and ask what the green transition is aiming to evolve? Other themes that could be considered include nature vs. built

environment, preservation vs. innovation, social equity vs. economic viability, active vs. motorised mobility, natural vs. engineered solutions or community engagement vs. technological innovation.

4. SYNTHESIS

Students and researchers in Finland have approached the green transition design challenge from different perspectives. Students built on the evolutionary design brief, their site visits and community discussions and used these to identify key values, map selected networks and resources, define project missions and use AI tools to develop alternative design solutions that they aimed to 'quantify' and select before developing a chosen set of interventions.
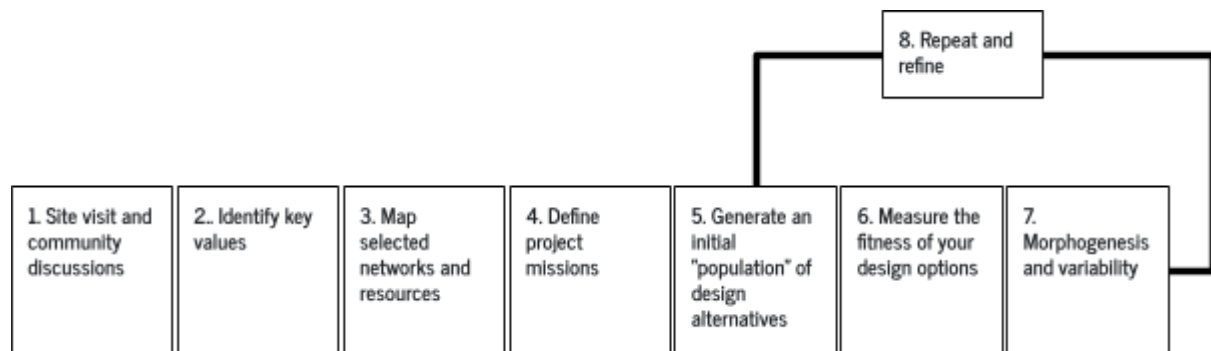
Fig 35: Evolutionary design process used in the capstone project

The research team has been more reflective, considering the challenges of architectural differentiation and thinking about how digital tools might provide a broad spectrum of visualisation solutions that are not necessarily limited by a specific green transition value, story or mission.
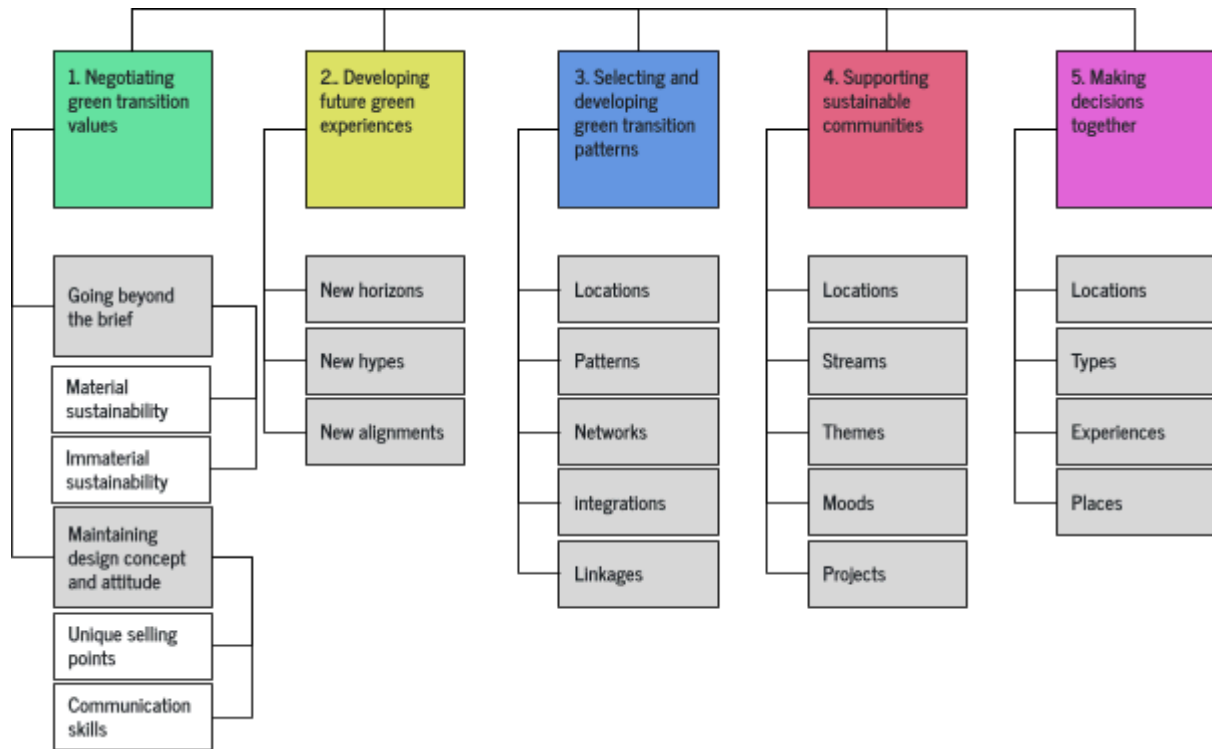
Fig 36: VOF tools and Aalto's suggested methods

One approach led to a focus on finding a key direction and then moving towards a set of design solutions in an iterative manner while the other seeks to broaden out design options at every stage.

This juxtaposition of design approaches reflects the twin desires of focus and openness that is often summarised in design through the double diamond process which swings between divergent and convergent investigations which ask designerly and entrepreneurial questions and seek design solutions in an iterative and cyclical fashion (Conway et al., 2017). While students aim to close down choices throughout the design process, the researchers are thinking about how each tool can open up options that are often closed down prematurely.

We can map the evolutionary design approach against the tools as a linear path and examine the relationship between these two approaches:
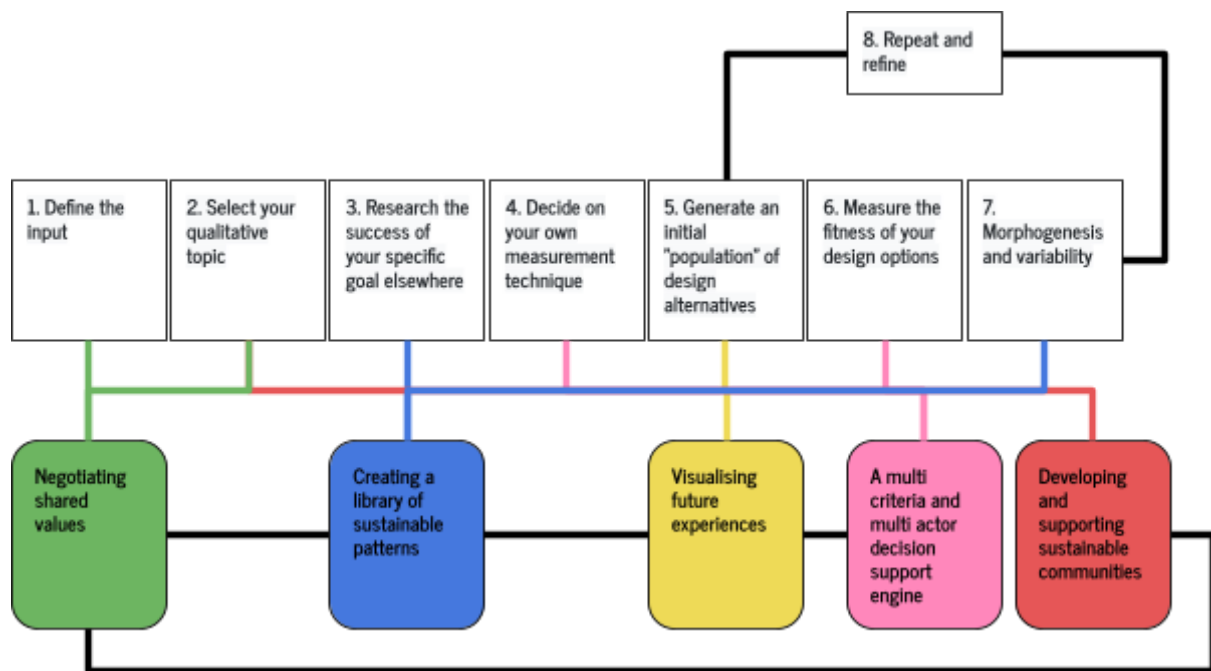
Fig 37: Relationship between evolutionary design approach and the VOF tools

- Negotiating shared values: This tool can be used in the "Define the input" and "Select your qualitative topic" stages. Architects can engage stakeholders to identify shared values related to the design goals and select qualitative topics based on these shared values.
- Visualising future experiences: In the "Generate an initial population of design alternatives" stage, architects can use visualisations generated by tools like Midjourney to explore different design directions and experiences. These visualisations can help in quickly conveying potential futures and scenarios and be used to apply techniques like morphogenesis and variability in order to iterate designs in response to client and community feedback.
- Creating a library of sustainable patterns: During the "Research how the success of your specific goal has been measured earlier and elsewhere" stage, architects can refer to a library of sustainable patterns to understand existing solutions and evaluate their effectiveness in addressing specific design goals.
- Developing and supporting sustainable communities: This tool can be integrated throughout the entire process, particularly in the stages related to community engagement and evaluation of design alternatives. Architects can use community feedback to refine design solutions and ensure they support the well-being and sustainability of local communities.
- A multi-criteria and multi-actor decision support engine: This tool can be employed in the "Decide on your own measurement technique" and "Measure the fitness of your sketches" stages. Architects can use the decision support engine to evaluate design alternatives based on multiple criteria and engage stakeholders in the decision-making process.

This matrix of interconnected issues needs to be materialised through a digital platform that acts as a container for our research as well as a tool box for Finnish design practice and development. To support the design of this platform we propose a set of 'conversational' activities which can be tested and refined during a workshop:

- Day 1 AM - Intro to visualising our future public realm with participants sharing their perspectives on what the green transition means to them, steps in evolutionary design, the value and clarity of each VOF tool, future architectural practice and their ambitions for the VOF digital platform.
- DAY 1 PM - A focus on understanding the project context including scale, location, stakeholders, local networks and resources: setting green transition missions (both qualitative and quantitative); value-sensitive design and its relationship to evolutionary design including Finnish values, different value models (cultural, human and brand values); visualising values through people and places; and its relationship to evolutionary design process such as 'defining the inputs' and 'selecting qualitative topics'. This should also reflect on ideas developed by Aalto researchers around Going beyond the brief, Material sustainability, Immaterial sustainability, Maintaining design concept and attitude, Unique selling points, Communication skills.
- DAY 2 AM - A focus on storytelling and experience-based design, including narrative and film-based storytelling in architecture that relate to values, stakeholders and green transition missions; and its relationship to evolutionary design processes such as the development of a population of alternative design narratives. This should also reflect on ideas developed by Aalto researchers around New horizons, New hypes, New alignments
- DAY 2 PM - A focus on sustainability patterns across various green transition challenges in process, construction, operation, maintenance and evolution; including patterns of delight related to different stakeholders and scales in architecture, urban design, mobility and service design; and its relationship to evolutionary design process such as researching the success of specific goals elsewhere and ways of measuring the success of different patterns and stories. This should also reflect on ideas developed by Aalto researchers around Locations, Patterns, Networks, integrations and Linkages.
- DAY 3 AM - A focus on playbooks and helping communities to develop sustainably over time through their own incorporation of values, stories, patterns and decision making into their own green transition which includes the architectural ideas developed through this design process. This should also reflect on ideas developed by Aalto researchers around Locations, Streams, Themes, Moods and Projects.
- DAY 3 PM - Reflection on the workshop activities and how each of these methods and approaches should be shared with other architects and researchers. This should include a reflection on each 'toolkit' and issues around multi-criteria and multi-actor decision-making in architecture including decisions around Locations, Types, Experiences and Places.

These activities will help the research team to understand the value of each tool, share design directions from their own research and consider how practitioners can use these tools as speculative methodologies, through conversational interfaces or through a digital prototype.

Ultimately, this set of activities will be used to develop a site map, wireframes and visually-led specifications for a project website that can be developed as part of the final delivery of the VOF project.

Fig 38: A potential VOF digital platform homepage

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6. FIGURES

Fig 1: Five elements of a toolkit to help architects and designers visualise and develop our future public realm

Fig 2: Definition workshop with Aalto researchers and Sitowise, Espoo, June 2023

Fig 3: Development workshop with Aalto students and researchers, RCA., London, Sept 2023

Fig 4: Site for the RCA workshop held in September 2023

Fig 5: RCA workshop agenda (September 2023)

Fig 6: Patterns as a network of design responses to context, problems and interconnected solutions P2P Foundation. (n.d.)

Fig 7: Participant 1 key principles, scoring and axonometric solution

Fig 8: Participant 2 mapping, densification and visualisation

Fig 9: Participant 4 measurement,, visualisation and references

Fig 10: Participant 5 values, infrastructure, evolutionary themes and courtyard interventions

Fig 11: Participant 6 design principles to support social mix

Fig 12: Participant 7 looking at the history and future of London through water and waste.

Fig 13: A sketch persona in Midjourney for a future citizen based on green transition hopes and behaviours.

Fig 14: Innovating with people using an inclusive design approach

Fig 15: An edited reproduction of McCloud's 'Big Triangle' design space of visual iconography

Fig 16: Suggested network and resources for Ethelburga estate

Fig 17: Mapping 15 minute city accessibility around Ethelburga estate using A/B streets

Fig 18: The THRIVE model attempts to provide a framework for inclusive, equitable and sustainable urban design but doesn't identify the design qualities associated with this future (Pineo, 2022).