

Designing for Health, Healing, and Wellbeing in the Built Environment

Potential Research Investigations with the University of Washington

The following investigations are initial science-based explorations to bolster NBBJ's aspiration to heighten the positive impact of the built environment on the health and well-being of building occupants. These focus areas directly relate to issues and opportunities within NBBJ's health+ and corporate markets and provide the ability to actively apply what is learned. Previous studies have included *Reducing Stress in the Clinical Workplace*, *Understanding the Impact of Space on Creativity*, and *Mitigating Acoustic Challenges in the Workplace*.

2023 CONSIDERATIONS

INVESTIGATION 1

Elevating Healing / Provoking Brain Activity through Projection Mapping

INVESTIGATION 2

Encouraging Movement through Intentional Design Interventions

INVESTIGATION 3

Creating a Digital Twin for Healthcare

INVESTIGATION 4

Leveraging Biology to Improve Materiality and Fabrication

INVESTIGATION 5

Elevating Healing / Provoking Brain Activity through Projection Mapping

INVESTIGATION 6

Rethinking "Waste(d)land"

INVESTIGATION 7

Breaking the Zoning Curse

INVESTIGATION 8

What makes space joyful? How does a building build culture?

INVESTIGATION 9

How does design education create and reinforce unconscious bias?

INVESTIGATION 10

What is the psychology behind loyalty?

The following pages describe in more detail the desired research outcome, the challenge, the project, and the resources required.

INVESTIGATION 1

Elevating Healing / Provoking Brain Activity through Projection Mapping

RESEARCH OUTCOME

Determine how projection mapping can create dynamic environments that stimulate brain activity

CHALLENGE

The built environment is readily knowable, and therefore we don't pay attention to it. A serious danger to creative industries is that curiosity and intrigue is no longer piqued once a building is entered, which is exacerbated by the fact that most people spend over 50% of their awake time during the week in this type of an environment.

Additionally, when we're healing in a patient room, our environment is static and does little to help our minds escape our physical and emotional pain.

PROJECT

Using projection mapping and/or interactive feature walls, create an ever-changing environment that blends both the digital and tactile to understand improvements in brain activity

RESOURCES

- *Physiological testing sensors*
- *Digital projection system*
- *Environmental graphics ideation and support*
- *Test subjects*

INVESTIGATION 2

Encouraging Movement through Design

RESEARCH OUTCOME

Create typologies with physical prototypes for spaces that "make" people move

CHALLENGE

Most spend an enormous time of their day sitting, a radical change from the 14 miles our far ancestors used to walk per day. The impact of this sedentary state – exacerbated by remote work – is highly detrimental to our physical and physiological states, relating directly to our stress and creativity levels.

PROJECT

Develop a series of parameters regarding the importance of movement and what inhibits mobility in current environments. Design 3-5 conditions that can be physically implemented and tested for the ability to encourage increased activity.

RESOURCES

- *Survey platform*
- *Physical space / building for mock-ups*
- *Biofeedback mechanisms to test heartrate and EEG*
- *Creativity testing platform*

INVESTIGATION 3

Creating a Digital Twin for Healthcare

RESEARCH OUTCOME

Improving patient care through the benefits that technology offers

CHALLENGE

The operational side of the digital twin model in the built environment is proving to be an effective way to improve a building, but not yet people. Our industry may design spaces, but those spaces don't just provide comfort - they help people work, live, and heal better. We should be able to manage and measure that too.

PROJECT

As various digital environments take shape that are human-centered, outline how this platform can extend beyond a social means of interaction to a care-based program

RESOURCES

- *Health+ Practice Leadership engagement*
- *NBBJ Digital Team*

INVESTIGATION 4

Leveraging Biology to Improve Material Selection and Fabrication

RESEARCH OUTCOME

Encourage designers to incorporate the living world into their work for more innovative and smarter outcomes

CHALLENGE

Almost the entirety of materials the design industry uses are synthetic. Many have volatile compounds or large embodied carbon footprints. What can we learn from nature, whether in our design (biomimicry) or in the materials used for those designs (biologic printing) to lessen the negative impact on our environment?

PROJECT

Create a "Yes You Can" provocation catalog that makes nature a starting point for the design process, even in some of our strictest environments (labs, hospitals)

RESOURCES

- *Partnership with materials science expertise*
- *Systems expertise*
- *Biologist*
- *Printing and fabrication capabilities*

INVESTIGATION 5

Elevating Healing / Provoking Brain Activity through Projection Mapping

RESEARCH OUTCOME

Determine how projection mapping can create dynamic environments that stimulate brain activity

CHALLENGE

The built environment is readily knowable, and therefore we don't pay attention to it. A serious danger to creative industries is that curiosity and intrigue is no longer piqued once a building is entered, which is exacerbated by the fact that most people spend over 50% of their awake time during the week in this type of an environment.

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PROJECT

Using projection mapping and/or interactive feature walls, create an ever-changing environment that blends both the digital and tactile to understand improvements in brain activity

RESOURCES

- *Physiological testing sensors*
- *Digital projection system*
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INVESTIGATION 6

Rethinking "Waste(d)land"

RESEARCH OUTCOME

Determine the process, yield, and impact of capitalizing on forgotten parts of our American landscapes

CHALLENGE

The United States remains automobile-centric, and much of our transportation between cities relies on the vehicle. Our highway network is well-established, but with the sole purpose of supporting traffic. The land that lies next to and between these massive roadways is a left-over thought, but can be repurposed for benefit and perhaps to offset the impact of the very reason it was constructed.

PROJECT

Evaluate how underutilized areas that connect cities (i.e. along freeways) can increase food production while decreasing carbon

RESOURCES

- *GIS*
- *NBBJ Landscape and UE studio*

INVESTIGATION 7

Breaking the Zoning Curse

RESEARCH OUTCOME

Identify policies and approaches that outline an equitable course to current and future development

CHALLENGE

Many of our cities began as organically-evolving platforms that revolved around walkability and livability. City planning in the early 19th century reinforced this mindset, but also started to hint at community and cultural hierarchy. As cities grew – as did the US – 20th century planning became machine-like, isolating programs to create an urban assembly line of sorts. This isolation, coupled with a focus on cars, introduced a substantial bias in zoning and city planning that created hard-edged lines of community segregation.

PROJECT

Evaluate the underlying causes that enable East and West Coast city planning to lead to the challenges we face today

RESOURCES

- TBD

INVESTIGATION 8

What makes space joyful? How does a building build culture?

RESEARCH OUTCOME

Outlining the obstacles that keep us from enjoying the places we work

CHALLENGE

The depth of overlap between life and work in our places of employment is just now being understood, but not yet explored. Employers and employees need a deeper sense of cultural and demographic knowledge to reach a level of professional intimacy that leads to fulfillment.

PROJECT

Use research to define happiness and use that understanding to develop behavior and space protocols to reinforce this emotion

RESOURCES

- Sean Aker, Robert Waldinger (Harvard)
- Dr. John Medina
- NBBJ mini-research on learned helplessness
- *The Culture Code* (Daniel Coil), *Nudge*

INVESTIGATION 9

How does design education create and reinforce unconscious bias?

RESEARCH OUTCOME

Define the ways education of students and professionals can overcome our natural and learned instincts towards designing for ourselves

CHALLENGE

As individuals, teams, organizations and even the very clients we work for, biases factor into our work without awareness. The outcome can be deeply detrimental to the diversity of inhabitants that occupy built spaces. As project deadlines grow shorter, time for research is impacted.

PROJECT

Explore the design-based education process (Frank Gehry, Stanford's D-School) and practice-based design process to develop an awareness-based framework; evaluate if design should be more akin to the scientific process

RESOURCES

- *Julius Erolin*
- *Dr. John Medina*
- *Kwame Christian*

INVESTIGATION 10

What is the psychology behind loyalty?

RESEARCH OUTCOME

Understand why younger people enter a workforce - and then stay

CHALLENGE

Certain professions, especially healthcare, do not have significant financial rewards. But the personal rewards they offer (fulfillment, impact, joy) is a strong retention factor that keeps employees at their jobs. What is driving people towards the best organizations if they work in the worst conditions?

PROJECT

Research and outline the science behind loyalty and determine how this can be related to – and improved – through experience design

RESOURCES

- *NBBJ Health+ Practice*