

REVITALIZATION OF "DEAD SPACE" THROUGH THE USE OF INTERACTIVE  
INTERVENTIONS

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# Abstract

This paper is based on research that focuses on the problem of "dead space" within the urban environment. The goal of this project is to come up with an interactive design intervention that will ultimately resolve issues of existing dead space. This paper will help readers obtain a clearer understanding of what "dead space" is and why it is so detrimental to the urban environment as well as define what interactive architecture is and how it can be beneficial to the revitalization of dead space. A multitude of case studies that deal with space revitalization were analyzed and three typologies were derived for determining potential sites. Through these typologies, sites were found which needed intervention and a Design Matrix is developed to aid in the development of an intervention. Scenarios were developed to provide a better understanding of how these interventions will work and be utilized. Finally, this paper discusses the process of this project and future developments.

# Table of Content

Acknowledgement.....	ii
Abstract.....	iii
List of Figures.....	vii
Chapter 1. Introduction.....	1
Chapter 2. Dead Space.....	4
2.1 Interstitial Space.....	5
2.2 Urban Cracks.....	8
2.3 Non-Place Space.....	11
Chapter 3. Interactive Architecture.....	13
3.1 Kinetic Architecture.....	14
3.2 Digital Architecture.....	14
3.2.1 Media Facades.....	15
Chapter 4. Why Interactive Interventions?.....	20
Chapter 5. Interactive Design Guidelines.....	23
5.1 ANIMATO.....	23
Chapter 6. Case Study.....	27
6.1 General.....	27
6.1.1 Zollverein Coal Mine Complex.....	28
6.1.2 Mobile Dumpster Pool.....	30
6.1.3 Better Block.....	32
6.1.4 Flash Mobs and Free Hugs.....	34

6.2 Specific.....	37
6.2.1 Nesting.....	37
6.2.2 Lo-Rez / Hi-Fi.....	39
6.2.3 Mapping the City.....	40
6.2.4 White Noise White Light.....	43
6.2.5 Lightswarm.....	44
6.3 Interactive Design Elements.....	46
Chapter 7. Design Scheme.....	49
7.1 Goals.....	49
7.2 Spatial Typologies.....	50
7.3 Sites of Consideration.....	50
7.3.1 Type 1: Interstitial Space.....	51
7.3.2 Type 2: Urban Crack.....	52
7.3.3 Type 3: Non-Place Space.....	54
7.4 Site Analysis.....	56
7.5 Design Matrix.....	64
7.6 Design Development.....	67
7.7 Scenarios.....	77
7.7.1 Scenario 1: Retreat Space.....	77
7.7.2 Scenario 2: Alternate Route.....	81
7.7.3 Scenario 3: Enlightening Workout.....	83
Chapter 8. Discussion and Future Development.....	88

Chapter 9. Conclusion.....	91
Bibliography.....	93

# List of Figures

Figure 1: Interstitial spaces captured by light.....	6
Figure 2: Casting of interstitial voids.....	7
Figure 3: An example of an urban crack.....	8
Figure 4: Hyposurface wall.....	14
Figure 5: Augmented Reality Kitchen.....	14
Figure 6: Display system on top of range.....	15
Figure 7: Empty site before the project.....	23
Figure 8: Curious pedestrians engaging with the intervention.....	24
Figure 9: "Free Bike" written with the marker.....	24
Figure 10: Table showing the 4 Step Design Process.....	25
Figure 11: Picture of a concert hall within the coal mine complex.....	28
Figure 12: Picture of the ice rink during the off season.....	29
Figure 13: Picture of the pool.....	29
Figure 14: Assembly of the pools. ....	30
Figure 15: Busy streets filled with pedestrians.....	31
Figure 16: Before and after pictures of better blocks.....	33
Figure 17: Example of a flash mob.....	35
Figure 18: Successful hug.....	36
Figure 19: Image of a nest in a tree.....	38

Figure 20: Image of the "grove" of poles.....	39
Figure 21: LED Wall Panel.....	40
Figure 22: A map created by one of the audience members.....	41
Figure 23: People interacting with the installation.....	43
Figure 24: Tracking motion of pedestrians through darkness.....	43
Figure 25: Individual modules of Lightswarm.....	44
Figure 26: Exterior view of Lightswarm.....	45
Figure 27: Interior view of Lightswarm.....	45
Figure 28: View of Type 1A access ramp.....	51
Figure 29: View of Type 1B from main pathway.....	51
Figure 30: View of Type 1B seating area.....	52
Figure 31: View of Type 2A seating area.....	52
Figure 32: View of Type 2B.....	53
Figure 33: View of Type 2C.....	53
Figure 34: View of Type 3A courtyard.....	54
Figure 35: View of Type 3B, a major promenade on campus.....	54
Figure 36: Site Plan showing location of pictures.....	55
Figure 37: Site Plan of the UH Manoa Campus.....	56
Figure 38: Highlighted view of access Ramp.....	57
Figure 39: View A.....	58
Figure 40: View B.....	58



Figure 41: View C.....	59
Figure 42: Location of pictures taken.....	59
Figure 43: Plan showing all of the pathways near the site.. ..	60
Figure 44: Collective circulation diagram .....	61
Figure 45: Individual circulation diagram.....	62
Figure 46: Circulation Data.....	63
Figure 47: Design Matrix.....	65
Figure 48 – Diagram of Transient and Retreat Space.....	68
Figure 49: Plan View of Skin and wall.....	69
Figure 50: Exploded axonometric view.....	70
Figure 51: Diagram of the skin element.....	71
Figure 52: Skin rotation diagram.....	72
Figure 53: Activity of the gym influences the intensity of the light.....	73
Figure 54: Breakdown of the components of the wall/canopy design.....	74
Figure 55: Display screens fitted into the wall.....	75
Figure 56: Shows the relationship between the various spaces.....	76
Figure 57: Rendered image of the skin and wall design.....	76
Figure 58: Professor notices lights.....	77
Figure 59: Wall reveals pathway.....	78
Figure 60: Light follows professor.....	78

Figure 61: Reveal of the retreat space.....	79
Figure 62: Retreat space.....	79
Figure 63: Professor Tom's path.....	80
Figure 64: Samantha observes the light.....	81
Figure 65: Skin and wall react to Samantha's presence.....	82
Figure 66: Samantha appreciates the installation.....	82
Figure 67: Samantha's path.....	83
Figure 68: Jason notices lights.....	84
Figure 69: View of the objects from the inside.....	84
Figure 70: Jason notices the lights are more active.....	85
Figure 71: Gym is packed.....	85
Figure 72: Closer look at the rotating panels.....	86
Figure 73: Jason's path.....	87

# Chapter 1. Introduction

The urban environment is an intricate system that has arisen, in part, due to the industrial revolution. Factory jobs became a major source of income, driving people to want to live closer to their workplace. This concentration of people created a demand for more infrastructures, thus creating the foundation for modern cities of today. This concentration of people and the complexity of the urban environment created a problem when it came to city planning.

“This management problem is made more difficult because the city’s political boundaries don’t fit the actual boundaries of the metropolitan community area. . . Each metropolis is effectively composed of many different decision-making units – central cities, suburban cities, counties, townships, police and fire districts, sewer and water districts, and so forth – all with separate voice and vote over the area’s future. It is, thus, more an agglomeration of places than an autonomous, self-governing unit.”<sup>1</sup>

The management of cities becomes hectic when there are multiple interests involved because there is no “one size fits all” solution to the concerns of each party. As a result, it creates an uneven growth of solid and void space within the city.

“Growth-related issues are often at the forefront of current urban crises. While growth is a basic goal of many cities, it produces its own problems. In the United States, urban sprawl and the deterioration of inner-city areas are major issues. These represent problems of ‘uneven development’ that

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<sup>1</sup> William A. Schwab, *Deciphering the City* (Upper Saddle River; Nancy Roberts, 2005), 8.

dramatically distinguish the social topography of the new urban landscape."<sup>2</sup>

The expansion and development of a city causes spots of urban decay to emerge. The constant changes within the city create an, "accumulation of disparate spatial experiences without a binding order, where form and void coincide."<sup>3</sup> These voids within the city are referred to in this paper as "dead space." Dead spaces arise from these conditions of varied growth and improper planning, which create spaces that are not conducive to social interactions. Dead spaces are comprised of three subsets of spaces: interstitial spaces, urban cracks, and non-place spaces. The problem with dead space is that it gives the impression of an unsafe, lonely, and unsanitary environment – factors that discourage people from occupying the space – and as a result, becomes a wasted space. Rather than expending a great deal of resources towards rebuilding the site, each space has the potential to be intervened.

"The rise of post-industrial sites in cities around the world have come about only in the past thirty or forty years and people don't know what to do with them. They think they should be removed and erased. What we've found over the past ten years is that you can actually take these post-industrial conditions and through creative design, actually produce something that people love. It's not erasure and it's not preservation it's really transformation."<sup>4</sup>

Through intervention, each site has the possibility of transforming into a beautiful space with the use of fewer resources than rebuilding. These interventions tap into the potential of the space, which can encourage people to take action and accept responsibility for the site. Part of revitalizing dead space is to increase the amount of social interaction that occurs, and a proposed way of doing this would be through the use of interactive architecture.

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<sup>2</sup> William A. Schwab, *Deciphering the City* (Upper Saddle River; Nancy Roberts, 2005), 8.

<sup>3</sup> Dekeyrel, Carlos, Riet Steel, Elly Van Eeghem, and Griet Verschelden. "Urban Cracks: Interstitial Spaces in the City." *Sabancı University*. September 2011. <http://isea2011.sabanciuniv.edu/paper/urban-cracks-interstitial-spaces-city> (accessed February 22, 2014).

<sup>4</sup> *Urbanized*. Directed by Gary Hustwit. Performed by Jan Gehl, Amanda Burden and James Corner. 2011.

Interactive architecture is a focus within architecture that utilizes technology as a way of creating a real-time feedback system between the built environment and people. Depending on its purpose, interactive architecture can change form, or function depending on specific inputs from participants. Each input produces a different output creating an iterative cycle of interaction between the participant and the architecture. This form of architecture can create a more engaging and meaningful experience which alters a person's perception of that space. The goal of this project is to illustrate the potential of interactive interventions as a more engaging solution to the social revitalization of dead spaces.

## Chapter 2. Dead Space

Throughout the urban environment there are pockets of spaces that deter the opportunity of social interaction. The spaces that are being referred to are called "Dead Spaces." According to Tetsuya Umeda, a Japanese artist, dead space,

"tends to emerge from the gap between what was envisioned for a building before it was constructed, and what was deemed necessary for it while the building was actually being used... you might find that there is a lot of dead space within architecture that has been sloppily conceived."<sup>5</sup>

According to Umeda, dead spaces are the result of poor planning. Developers, planners, or architects create buildings that do not flow within the existing built environment creating pockets of space, which are devoid of human occupancy. Conversely, dead spaces can be well planned and thought out, yet not as successful as originally intended. In these cases the space can be highly occupied, yet devoid of any social interaction. In his works Umeda creates live performances in order to bring the audience attention to the surrounding space. To further clarify the definition, "dead space" is space within the built environment that is devoid of social interaction between people. Dead space can be further defined by breaking it down into three terms or categories:

- Interstitial Space
- Urban Cracks
- Non-places

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<sup>5</sup>Wee, Darryl. "INTERVIEW: Tetsuya Umeda on Osorezan and Dead Space." *Blouin Art Info*. November 13, 2013. <http://enjp.blouinartinfo.com/news/story/984412/interview-tetsuya-umeda-on-osorezan-and-dead-space> (accessed February 16, 2014).

## 2.1 Interstitial Space

Interstitial spaces are in-between spaces within the urban fabric, which serves both official and unofficial purposes. These spaces come about through the proper planning of the city creating negative spaces within the built environment. In his paper "Kevin Lynch, Walter Benjamin and Interstitial Space in San Francisco," Tanu Sankalia analyzed the interstitial spaces within the residential housing areas of San Francisco.

The writings of this paper compared the views of urban planner Kevin Lynch, and philosopher Walter Benjamin. Lynch is best known for his book *The Image of the City* in which he proposes ways of planning cities that aid people in creating cognitive/visual maps of the city. Benjamin, on the other hand, focused further on the structure and the systems that are implemented within the city, becoming an archaeologist of sorts.

"Overlooked places are like lost time, it suggests an erasure of the memory of a city. Benjamin's writings aid in regaining a sense of historic time, not a nostalgic past, but a critical engagement with history."<sup>6</sup>

The paper focuses on the residential neighborhoods of San Francisco, which contain row houses of Victorian structures two to three stories high. Between these structures are interstitial spaces which,

"Reveal the porosity of the urban block, drawing one's eye into the interior spaces, blurring distinctions between the public realm and private space, creating a percussive rhythm of alternative positive and negative space, and

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<sup>6</sup> Sankalia, Tanu. "Kevin Lynch, Walter Benjamin and Interstitial Space in San Francisco." *World in Denmark Conference*. Copenhagen, 2010. Pg 8

producing a narrative of place—of its identity and character—based on its marginal entities.”<sup>7</sup>

Benjamin looks at the void spaces as well as the non-void spaces as a way of defining the city. These spaces often form functions that complement the built space. As opposed to other writings, which define interstitial spaces as abandoned or unattractive spaces that are like scars upon the urban landscape,

Figure 1: Interstitial spaces captured by light (photo by Tanu Sankalia). Source: Sankalia, 2010.

Benjamin understands that there are exceptions to these spaces that provide a functional aspect to the environment. In time these spaces shift from their original purposes and are adapted to suit the needs of people within the surrounding area.

“Although initially planned almost exclusively to serve as light-wells and access to rear yards, slots (interstitial spaces) have accommodated new functions and transformed into service yards, garages, gardens and entrances creating new layers of use and meaning in the pragmatic consideration of Victorian architecture.”<sup>8</sup>

Interstitial spaces offer a lot more potential, in terms of functionality of the space, than what is originally intended for it. As a result, people often take informal ownership of these spaces and redefine the function of the space.

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<sup>7</sup> Sankalia, Tanu. "Kevin Lynch, Walter Benjamin and Interstitial Space in San Francisco." *World in Denmark Conference*. Copenhagen, 2010. Pg 8

<sup>8</sup> Ibid. 9



Figure 2: Casting of interstitial voids (model by Samuel North). Source: Sankalia, 2010.

Towards the end of the paper Sankalia presents the works of artists who cast the negative spaces of objects to reveal the "spaces that we see but never register or represent."<sup>9</sup> This same process is applied to the interstitial spaces of the city in which the cast of slots, "retain the impression and traces of a past architecture and urban form, yet exist as a new object in the present."<sup>10</sup> These castings give recognition to the in-between spaces and offer "architectonic forms" that can be reinterpreted and implemented throughout the city.

Regarding the issue of how the analysis of these slots could aid in the design of the city.

"First, the analysis of slots presents an operational understanding of the structure of the city, it uncovers a spatial rule of the urban fabric in contrast to an "all-encompassing image"...Second, the forms derived from casting slots, can be operated upon, architecturally transformed and redeployed in the city as new formal configurations."<sup>11</sup>

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<sup>9</sup> Sankalia, Tanu. "Kevin Lynch, Walter Benjamin and Interstitial Space in San Francisco." *World in Denmark Conference*. Copenhagen, 2010. Pg 10

<sup>10</sup> Ibid. 11

<sup>11</sup> Ibid. 11

By understanding the spatial quality of the voids as well as the non-voids, we are able to reinterpret the voids throughout the city. Also, by understanding the structure of the city and how it operates, we are able to create an "open-ended operational model" for the city that can adapt to the transformation of the city.

It is difficult to avoid the creation of dead spaces and, at certain times, it is even necessary to have these spaces within the urban environment. Once a functional, as well as physical understanding of the dead space is established, the reconfiguration and revitalization of dead spaces can begin.

## 2.2 Urban Cracks

"Urban Cracks" is a term introduced by Dekeyrel et. al., in a presentation at the 17<sup>th</sup> International Symposium on Electronic Art entitled, "Urban Cracks: Interstitial Spaces in the City." The term describes the various voids within the city that become scars upon the urban landscape. These cracks are caused by urban decay, misuse of space, poor planning, etc. and gives the spaces a feeling that it is unsanitary and unsafe.

"These spaces are (sometimes) the waste from the real-estate market or due to the temporary neglect of the urban planning policies. They are 'other spaces,' the other of what constitutes the planned city."<sup>12</sup> These urban cracks are another one of the ways that the term, dead space, is defined.

Figure 3: An example of an urban crack, this neglected lot becomes the site of an art display. Source: Dekeyrel, et al. 2011.

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<sup>12</sup> Jones, Peter Blundell, Doina Petrescu, and Jeremy Till. *Architecture and Participation*. London: Spon Press, 2005. Pg 58

The focus of the presentation was to discuss the importance of artists and art pieces in bringing attention to urban cracks within the urban landscape. Coming from the point of view of artists, the presentation offered a different perspective towards the development of interstitial spaces. Dekeyrel et. al. introduced the term "Urban Cracks," which is "conceptualized as in-between time spaces in which different logics meet and conflict."<sup>13</sup> Dekeyrel et. al. continue on and quote philosopher Dirk van Weelden in saying, "these places as manifestations of the inoperative city; and accumulation of disparate spatial experiences without a binding order where form and void coincide."<sup>14</sup> Through this definition, urban cracks share a similar definition to interstitial spaces in that they are the leftover spaces that occur throughout the transformation of a city. Yet an urban crack is different in that it is not as well planned as an interstitial space.

"These functionally indeterminate sites seem to have grown rather than planned and therefore appear to be reverse urbanism...urban cracks belong to a constantly changing city, where houses are built and pulled down, where vacant lots emerge and disappear. These spaces regularly await a future destination within the context of urban renewal."<sup>15</sup>

The idea of "future destination" and "context" becomes a reoccurring driving force for the art pieces Dekeyrel et. al. implement within the urban cracks. With most urban renewal projects, the focus is on "beautifying and boosting" the appearance of the space, which although is the ultimate goal, may work against the artists. It is not enough to just simply beautify the space, but the artist must inform the visitors of the history and logic of the space. "Urban cracks can tell us something about precarious

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<sup>13</sup> Dekeyrel, Carlos, Riet Steel, Elly Van Eeghem, and Griet Verschelden. "Urban Cracks: Interstitial Spaces in the City." *Sabancı University*. September 2011. <http://isea2011.sabancıuniv.edu/paper/urban-cracks-interstitial-spaces-city> (accessed February 22, 2014).

<sup>14</sup> Ibid

<sup>15</sup> Ibid

urban planning predominantly driven by economic concerns."<sup>16</sup> By informing influential citizens, officials, and planners, artists are able to possibly prevent urban cracks from arising again. Artists' works essentially become "counterweights to a dominant imaging of the city."<sup>17</sup>

"Artists can bring into visibility the city's logics and are able to reinterpret, short-circuit or recompose them. Through their work, they can narrate changing urban conditions."<sup>18</sup>

The artist becomes the storyteller and the art piece their medium. An example of this can be seen in Figure 2, in which a model was built and the voids of the interstitial spaces were casted to obtain a visual understanding of the volume of space.

"The artwork is not merely an object, but a transformed perception of the environment... Their 'design on the spot' becomes a performance of the space, rather than a representation or description of it."<sup>19</sup>

Their work embodies the space and engages participants to understand their surroundings as they have never envisioned before.

The important pieces of information to take away from the presentation are the concept of "Urban Cracks" and the use of art pieces to combat urban cracks. Urban cracks are the in-between spaces that are the result of the ever-

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<sup>16</sup> Dekeyrel, Carlos, Riet Steel, Elly Van Eeghem, and Griet Verschelden. "Urban Cracks: Interstitial Spaces in the City." *Sabancı University*. September 2011. <http://isea2011.sabanciuniv.edu/paper/urban-cracks-interstitial-spaces-city> (accessed February 22, 2014).

<sup>17</sup> Ibid

<sup>18</sup> Ibid

<sup>19</sup> Ibid

changing urban environment. In order to combat these urban cracks, artists create interventions that inform people of the causes of these spaces in hopes that a lesson can be learned and these cracks will not arise again.

## 2.3 Non-place Space

So far the empty or derelict categories of dead spaces have been the focus of discussion. There is still one more category that deals with dead spaces that are populated, which are called "non-places". While they are still populated and frequented spaces, barely any social interaction occurs within non-places, thus rendering them dead spaces. As mentioned earlier in this paper, dead spaces are spaces devoid of social interaction. Jan Gehl, a Danish architect, puts it best when saying, "if people get involved in social activity they will forget place and time and just enjoy. That's why I would say, do not look at how many people are walking in a city, but look at how many people stopped walking to stay and enjoy what is there."<sup>20</sup>

Social interaction is what determines a space, it is what gives meaning to a place. "A problem of non-places, which produce an experience of loneliness, reducing social interactions in public spaces to a few scenarios, could be used as a starting point for examining emerging alternative forms of sociality in public spaces."<sup>21</sup> By not having social interaction a space continues down a cyclical path of becoming non-place. As mentioned above, non-places evoke feelings of loneliness within a space which discourages occupants from interacting and the lack of interaction continues to feed into the idea of loneliness. In order to break from this trend of non-place, actions must be taken in order to disrupt the spiraling trend. According to Lavrinec, there are two ways of giving space a sense of place:

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<sup>20</sup> *Urbanized*. Directed by Gary Hustwit. Performed by Jan Gehl, Amanda Burden and James Corner. 2011.

<sup>21</sup> Lavrinec, Jekaterina. "Revitalization of Public Space: From "Non-Places" to Creative Playgrounds." *Coactivity: Philosophy, Communication*, 2011: Pg 70

"1) Reinterpretation of the existing routine scenarios, proposing alternative ones, which draw attention to the potential of a certain place, 2) reorganization of spatial structures of a public space by installing new objects, which start attracting passers-by and provoke an active interpretation of it."<sup>22</sup>

In both suggestions the main concept is to break up the normative actions that occur within a space to allow people to see the potential of the space. The first tactic suggests a more ephemeral approach by showing occupants the potential of a space momentarily without leaving a trace afterwards. This forces the participants to engage for an instance, grabbing their attention and breaking the participants out of the loneliness of the space. The second tactic deals with physical installations or interventions, which encourages occupants to participate and engage with the piece and, ultimately, the space.

Dead spaces are spaces that are devoid of human interaction and consist of three categories: Interstitial Space, Urban Crack, and Non-Places. Interstitial spaces are spaces within the built environment that serves a functional purpose, but offers more potential in usage of the space. Urban Cracks are spaces that arise from poor planning or neglect, which can give it the appearance of being of unsanitary and unsafe, deterring people from using it. Non-Places are heavily trafficked spaces that are devoid of social interaction and gives people the sense of loneliness. With this base knowledge of dead space and the problems that arise from them, the next step is to understand what Interactive Architecture is.

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<sup>22</sup> Lavrinec, Jekaterina. "Revitalization of Public Space: From "Non-Places" to Creative Playgrounds." *Coactivity: Philosophy, Communication*, 2011: Pg 71

# Chapter 3. Interactive Architecture

Winston Churchill once said, "we shape our buildings, and afterwards our buildings shape us,"<sup>23</sup> in response to the tragic destruction of the House of Commons. The intent of this quote was to describe how Churchill's time spent within the House of Commons has shaped who he is, and this simple quote creates a big impact within the field of architecture. Architecture has a profound impact on the way people live their lives and can become an expression of the architect and owner's personalities. Until recently it was left to the architect to make every decision for a building, but now a lot of power has been shifted to everyday people.

Interactive architecture is a new concept of architecture that has come about through the advances in technologies. It is architecture that reacts, responds, and interacts with its participants through physical or virtual means. In order for it to be considered truly interactive it must be a "two-way street...systems must utilize a definition of interaction as circular, or they are merely 'reacting' and not 'interacting.'"<sup>24</sup> The participant performs some sort of action and the architecture responds accordingly allowing the participant to interact further. This cyclical interaction continues until there is a desired outcome, and each outcome becomes unique. The architecture should perform a "bottom-up role in configuring their surroundings in a malleable way without specific goals," thus allowing for a more open and interpretive interaction. Participants are free to create their own space without any pre-set, or scripted ideas.<sup>25</sup>

There are two forms of interactive architecture : kinetic and digital. Kinetic architecture deals with physical changes in form, while digital architecture uses virtual

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<sup>23</sup> The Churchill Centre. *Famous Quotations and Stories*. n.d.  
<https://www.winstonchurchill.org/learn/speeches/quotations/famous-quotations-and-stories>  
(accessed February 14, 2014).

<sup>24</sup> Kemp, Miles, and Michael Fox. *Interactive Architecture*. New York: Princeton Architectural Press, 2009.  
Pg 13

<sup>25</sup> Ibid. 14

representations to manipulate or imply form. Figure 4 is an example of kinetic architecture.

### 3.1 Kinetic Architecture

The Hyposurface wall is an interactive installation developed by dECOi Architects that is used for special events as an entertainment piece.<sup>26</sup> The wall consists of many triangular pieces attached to actuators, which allows the

wall to change form in a multitude of ways. The wall system is connected to a series of sensors, which collect various data from the surrounding environment such as sound and movement. The wall can be programmed to create preset forms, such as spelling out words or displaying logos and can even be connected to the Internet.

Figure 4: Hyposurface wall. Source: Hyposurface n.d.

### 3.2 Digital Architecture

Digital interactive architecture uses virtual means to manipulate space and imply form. Figure 5 is an example

Figure 5: Picture displaying projections on surfaces within the Augmented Reality Kitchen. Source: Bonanni, Lee and Selker 2005.

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<sup>26</sup> *Hyposurface*. n.d. <http://hyposurface.org/> (accessed March 19, 2014).



of digital architecture called the Augmented Reality Kitchen designed by students at the MIT Media Lab.<sup>27</sup> This is one of the many projects that are part of the "Counter Intelligence" competition held at the MIT Media Lab.

The purpose of the project is to help enhance multi-tasking in the kitchen setting while creating a safe environment.

The project deals with a series of projections on to

various surfaces that are fed by various sensors

Figure 6: Display system on top of range offering cooking tips. Source: Bonanni, Lee and Selker 2005.

throughout the kitchen. While these projections do not change the physical form of the kitchen they allow for a more immersive experience with the built environment through the interaction with the digital form.

### 3.2.1 Media Façade

According to Francis Ching:

"As a design element, the plane of an exterior wall can be articulated as the front or primary façade of a building. In urban situations, these facades serve as walls that define courtyards, streets, and such public gathering places as squares and marketplaces."<sup>28</sup>

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<sup>27</sup> Bonanni, Leonardo, Chia-Hsun Lee, and Ted Selker. "CounterIntelligence: Augmented Reality Kitchen." *Association for Computing Machinery*. Portland, 2005.

<sup>28</sup> Ching, Francis D. K. *Architecture: Form, Space, and Order*. Wiley, 2014. Pg 274

Ching helps to paint a vivid picture of facades; they are the exterior wall element that is situated between the primary building element and some form of open space. A key thing to note here is the idea that facades have the ability to "define" these open spaces and influence the immediate space surrounding them. This manipulation of space is done through the physical massing of the façade and the built environment. Yet, as will be discussed later, the façade's ornamentation and aesthetics also play a big factor in this manipulation. Though this definition of façade is pretty basic it will be more beneficial to break the subject matter etymologically.

According to Wojciech Kalaga, the English word *façade*, is derived from the Italian word *facciata*, which directly translates to "face of the building,"<sup>29</sup> this is the definition as is understood now. To break things down even further, the root word is derived from the Latin word *faciē*, which translates to *face*.<sup>30</sup> This definition illustrates that the façade of the building is essentially the "face" of the building. Kalaga further continues to say that:

"The activity of face and *façade* relates to the basic dichotomy between the inside and the outside, and manifests itself as an unveiling of what is hidden and invisible, and what would have remained invisible were it not for the *f/act* of externalization."<sup>31</sup>

This definition of façade begins to show the relationship between the internal and the external space. The façade not only defines and influences the exterior space, but it can also have an effect on defining the interior space. In this way, according to Kalaga, the facades acts in a similar fashion to the way a mask works upon our face.

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<sup>29</sup> Kalag, Wojciech. "Face/Façade: The Visual and the Ethical." *Town Planning and Architecture*, 2010: Pg 120

<sup>30</sup> Kalag, Wojciech. "Face/Façade: The Visual and the Ethical." *Town Planning and Architecture*, 2010: Pg 120

<sup>31</sup> Ibid. 121

This metaphorical mask has the ability to either hide the true essence of a being or it may reveal or perpetuate it. Through this mask, people also have the ability to manipulate the way others view them. Building façades have the ability to influence how people from the outside environment perceive the space within the building. These facades may also be able to influence the way people perceive the exterior space. Over time, with the advancement of technology, the static form of the façade begins to shift to allow for a more dynamic appearance. One example of a more dynamic type of façade is a media façade.

Media façades are, "very large programmable screens that are usually affixed to the front of the building."<sup>32</sup> A prime example of media facades can be seen all throughout Times Square in New York. Times Square is a major urban intersection that is flanked on all sides by buildings, and along building facades are numerous amounts of screens. These screens are capable of displaying a variety of information, yet mainly show advertisements and news feeds. "In the mid-1990s, Mitchell predicted that future computer technologies would affect most of the built environment to the extent that buildings will turn into computer interfaces."<sup>33</sup> The advance in technology, through things like computing power and availability of LED panels has offered more opportunities for designers to create these media facades. Along with the advancement of computers and display screens, the increasing availability of ubiquitous technologies, such as smart phones and touch-screen tablets, have offered a new platform to which designers can create new forms of perception and interaction with a façade.

Unfortunately, the ideology of media facades is more focused on flooding pedestrians with advertisements than to create a spatial experience. As a result, context within the built environment is lost with media facades. There is a big movement in the realm of the urban media façade designers to create a more immersive experience through

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<sup>32</sup> Behrens, Moritz, Duncan P. Brumby, Ava Fatah gen. Schieck, and Nina Valkanova. "Smart Citizen Sentiment Dashboard: A Case Study into Media Architectural Interfaces." PerDis '14. Copenhagen: ACM, 2014. Pg 19

<sup>33</sup> Ibid. Pg 20

allowing people to interact with the buildings and creating a unique user experience. Unfortunately, there are a few challenges when it comes to this. Peter Dalsgaard and Kim Halskov, at the Center for Digital Urban Living has come up with a list of 8 challenges.<sup>34</sup>

Challenge 1: New Interfaces- This challenge deals with how people will interact with the interface of the façade as well as how will the information, being displayed, also interact with the façade. While technology has the ability to be ubiquitous, the urban environment and infrastructure does not. Each site must be a case by case process in terms of interface and scalability.

Challenge 2: Integration into physical structures and surroundings - Rebuilding new infrastructure is costly and time consuming, which means that these new forms of facades must be integrated into the existing environment. This improve your design through giving the project context thus creating a more meaningful piece.

Challenge 3: Increased demands for robustness and stability - Longevity of installations must be taken into consideration. These electronic pieces are often subject to the unforgiving elements of the natural environment and must be able to last for a long time and have thoughts of maintenance already incorporated.

Challenge 4 : Developing content to suit the medium - Understanding your audience and the scale of your project is key to a successful piece. The information displayed must be suitable for your audience.

Challenge 5 : Aligning stakeholders and balancing interests - It is nearly impossible to implement a media façade without the financial, social, or political. support of

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<sup>34</sup> Dalsgaard, Peter, and Kim Halskov. "Designing Urban Media Facades: Cases and Challenges." CHI '10. Atlanta: ACM, 2010. 2280-2285.

stakeholders. The content being displayed must be able to accommodate the needs of the designer , the stakeholder , and the audience.

Challenge 6 : Diversity of Situations - There are a variety of situations that occur throughout the urban environment whether it be physical constraints, to social diversity and many times these situations change over time. It is important that the media facades address the possibility of all situations and incorporate possible expansions or changes over time.

Challenge 7 : Transforming Social Relations - Understanding the existing social infrastructure of the area and how the installation could possibly affect or change these social infrastructures. People are sometimes reluctant to new situations or experiences, so the installation must make sure not to cross boundaries people wouldn't be comfortable with.

Challenge 8 : Emerging and Unforeseen Uses of Places and Systems - Within the urban environment you have a wide variety of people, and not everyone is going to view or interpret the media façade the same way. It is important to try and incorporate any unforeseen interactions into the design of the project.

Addressing these challenges will allow designers to create a more meaningful media façade. These façades become more dynamic by understanding their audience, the site, and the ways in which they will be used. With this basic knowledge of what interactive architecture is, the question now becomes why is interactive architecture a possible solution for revitalizing dead space?

# Chapter 4. Why Interactive Interventions?

As was mentioned before, dead spaces arise from the poor planning and inconceivable usage (or lack thereof) of space. It is difficult to prevent dead spaces from arising and once they do arise they are even more difficult to get rid of. One solution to the problem of dead space would be to rebuild, which could be very costly and time consuming as much modification would be needed to existing infrastructures. This paper proposes the implementation of interactive installations as a quicker and more cost effective way of revitalizing dead space. Typically installations are quick builds and only last a few days within the space. While they are not permanent they reveal the potential the space has, breaking away from previous notions.

"To facilitate the consideration of space utilization it is convenient to examine, in turn, the relationships between various combinations of spatial interactions; people in relation to physical artifacts, people in relation to other people, groups in relation to physical artifacts and groups in relation to other groups."<sup>35</sup>

The quality of space can be determined by the interaction between people within the space as well as their interaction to artifacts or installations also within the space. This begins to solve the question of why should installations be interactive. The more interaction that occurs within a space means the more utilized the space is.

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<sup>35</sup> Canter, David. *Environmental Interaction : Psychological Approaches to our Physical Surroundings*. New York: International Universities Press, 1976. Pg 130

"The driving force behind the renewed interest in adaptable architecture is the technologically influenced and changing patterns of human interaction with the built environment. Today's intensification of social and urban change, coupled with concern for issues of sustainability, amplifies the demand for interactive architectural solutions."<sup>36</sup>

Traditionally, people have only been able to experience architecture through static means. Once built, the form of the building stays the same and any adjustments to it would take time and money. Now, with the availability and interrelation of technology, the built environment can now be experienced in a more dynamic way.

Bloomer and Moore put it best when they say, "all architecture functions as a potential stimulus for movement, real or imagined. A building is an incitement to action, a stage for movement and interaction. It is one partner in dialogue with the body."<sup>37</sup> While Bloomer and Moore wrote this passage far before the time of interactive systems, they understood the need for an environment that engages and stimulates the human body. We experience the world through our five senses and the built environment, in essence, becomes an extension of our own body. Of the senses, though, they consider the "haptic sense" the most valuable.

"The haptic sense is the sense of touch reconsidered to include the entire body rather than merely the instruments of touch, such as the hands. To sense haptically is to experience objects in the environment by actually touching them (by climbing a mountain rather than staring

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<sup>36</sup> Kemp, Miles, and Michael Fox. *Interactive Architecture*. New York: Princeton Architectural Press, 2009. Pg 18

<sup>37</sup> Bloomer, Kent C., and Charles Willard Moore. *Body, Memory, and Architecture*. New Haven: Yale University Press, 1977. Pg. 59

at it)...No other sense deals as directly with the three-dimensional world or similarly carries with it the possibility of altering the environment in the process of perceiving it; that is to say, no other sense engages in feeling and doing simultaneously.<sup>38</sup>

The haptic sense offers more of an immersive experience by creating a direct connection and engaging the participant. By being engaged within a space, the participant is more likely to be influenced or be captivated by a space. Through this performative engagement, interactive installations can potentially encourage participants to engage within a space through a multi-sensory experience.

This chapter has gone over the potential of installations as a quick and cost efficient way of solving the problem of dead spaces. The quality of space can be determined by not only how a person interacts with the space, but also by how they interact with objects within the space. By adding an interactive element to these installations, they become more engaging, creating a more meaningful connection between the built environment and the participant. So far this paper has defined dead space and interactive architecture and has proposed the use of interactive installations as a solution; the next chapter will discuss some criteria for interactive design.

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<sup>38</sup> Bloomer, Kent C., and Charles Willard Moore. *Body, Memory, and Architecture*. New Haven: Yale University Press, 1977. Pg. 34-35



# Chapter 5. Interactive Design Guidelines

Through the discussion of Media Facades, the consideration of the, "8 Challenges of Urban Media Facades" has been introduced. These challenges have given us a small insight into the criteria needed to design purposeful media façades. The following article will delve deeper into more detailed criteria for interactive design.

## 5.1 ANIMATO

Animato is an installation piece created by Sandra Vina for the "Living Room" festival held in Turku, Finland. The goal of the project was to engage people within a space while creating a sense of community. "The work looks into aesthetics and functionality of the tool and space for engaging with people. ...the work briefly presents the interrelation of design elements, triggers of people, and levels of participation in the light of *Animato*."<sup>39</sup>

Figure7: Empty site before the project. Source: Vina 2010.

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<sup>39</sup> Vina, Sandra. "Engaging People in the Public Space - ANIMATO a Design Intervention." *Association for Computing Machinery*. Sydney, 2010. Pg 235.

The setting for the project was set in an empty lot; part of the goal for the intervention was to revitalize empty spaces within the city. The project is made up of a series of metal partitions upon which are a set of magnetic words, shapes, and markers for drawing. The

set of words allowed participants to create messages, the shapes allowed for creative images, and the marker allowed for a mixture of the two with the freedom of a marker and not set objects. The project consisted of two parts: the

first was a non-guided interaction in which there were no instructions on how

to use the intervention. During this time majority of the interaction was with the preset words and shapes. Poems were created with the words and non-typical shapes were created with the geometries. During this time "the level of engagement...was relatively short."<sup>40</sup>

The second half of the project was a guided interaction, which was achieved by posting questions upon the intervention. The questions posted on the board pertained to concerns about the local government and suggestions towards bettering the city. "The aim of this modification was to compare the level of participation and engagement through studying the content produced by people, and based on guiding topics vs. openness of themes."<sup>41</sup> During this time period it was noted that the various

Figure 8: Curious pedestrians engaging with the intervention. Source: Vina 2010.

Figure 9: "Free Bike" written with the marker in combination with the shape of a bike. Source: Vina 2010.

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<sup>40</sup> Vina, Sandra. "Engaging People in the Public Space - ANIMATO a Design Intervention." *Association for Computing Machinery*. Sydney, 2010. Pg 237.

<sup>41</sup> Ibid

tools were more often used in combination in order to convey the person's message. "The use of local content was beneficial for motivating people to interact, communicate and participate."<sup>42</sup> Through this guided intervention, more participants interacted with the interventions and even those who did not interact with the intervention, interacted with other participants.

Lastly, Vina presented a table which consisted of four aspects of design participation that helped to guide the design of the *ANIMATO* project.

"The four levels for designing for participation in public places; motivational, physical, intellectual, and emotional. The interrelation of the levels with the design elements was an essential aspect during the design process."<sup>43</sup>

The first level, "Motivational," deals mainly with aesthetics of the intervention as it is visual stimuli that are the first thing that attracts participants. While sight is a primary sense, this step could be further expanded by incorporating multiple senses to attract people. The second level,

"Physical," deals with the "functionality, practicality and playfulness of the physical space and the supportive tools provided for the public."<sup>44</sup> What artifacts are you providing that allow people to

engage with the piece? This step deals with the function of the

installation and how it allows people to interact. The third level of the design process

Figure 10: Table showing the 4 Step Design Process. Source: Vina 2010.

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<sup>42</sup> Vina, Sandra. "Engaging People in the Public Space - ANIMATO a Design Intervention." *Association for Computing Machinery*. Sydney, 2010. Pg 238

<sup>43</sup> Ibid.

<sup>44</sup> Ibid.

is "Intellectual" - what is the content of the project, and how does it stimulate participants to want to engage? This level is one of the most important levels; it is what keeps people engaged with the intervention and creates a deeper form of engagement with the participant. "Emotional" is the final level to the design process, it deals with the sense of belonging. The participant creates something as a result their interaction with the intervention, contributing to it and becoming a part of the community. "When these dimensions are appropriately designed and implemented it is most likely that the person has a positive experience and reacts to the work as significant."<sup>45</sup> These four steps break down and understand the fundamentals of interactive design and are able to be used to inform design. For this purpose, this four step process (also referred to as the interactive design guidelines) will be the main element to help guide design decisions for this project.

So far the foundation for this project has been presented through identifying and defining what "Dead Space" is and as well as introducing the idea of Interactive Architecture and the two forms of interaction (kinetic and digital). Lastly, the consideration of the eight challenges and the interactive design guidelines have been provided through the writings of the previous articles. With this base of knowledge, the next step will be to look at a series of case studies relevant to the idea of revitalizing dead spaces and analyze each project using the eight challenges and four guidelines in order to possibly find common design elements.

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<sup>45</sup> Vina, Sandra. "Engaging People in the Public Space - ANIMATO a Design Intervention." *Association for Computing Machinery*. Sydney, 2010. Pg 238

# Chapter 6. Case Study

In order to further understand how interactive interventions, or interventions in general, would help revitalize dead space a series of case studies have been collected. There are two categories of case studies being presented: general revitalization strategies, and specific intervention strategies. In general strategies, various projects that dealt with the issue of space revitalization, in the context of social interactions were the focus of the genre. Specific strategies contain a collection of projects that used interventions and interactive means towards revitalization of space. In both cases, the focal point was to highlight projects that dealt with the three different categories of dead space (Interstitial Space, Urban Cracks, and Non-places). Lastly, in order to better understand successful elements within each project, each case study will be analyzed with the four categories of the interactive design guideline as well as the eight challenges of media façades.

## 6.1 General

While general case studies do not deal with the same interactive interventions that will be implemented within this project, it is important to look at and analyze these projects because they deal with the basic understanding of how to design and revitalize a dead space. These projects deal with the same base problem of solving the issue of dead space and they develop unique strategies and designs to combat these situations. Through these projects important design elements can be selected, which help to inform the design of this project.

### 6.1.1 Zollverein Coal Mine Complex

The Zollverein Coal Mine Complex is an old coal mining facility that has been converted into an entertainment, business, and recreation center. Located in Essen, Germany, this old coal mining facility, which opened in 1846 and shut down in 1986, was added to the list of UNESCO World Heritage Sites in 2001. Being a part of the World Heritage Sites means that only small renovations can be done and the main infrastructure of the complex could not be modified. This becomes helpful as a case study because, as was mentioned earlier in this paper, this project intends to revitalize dead space with minimal impact to existing infrastructure. The facility was bought by the North Rhine-Westphalia state with the intention to use the old facility as an exhibition center, creating various amenities for the public while using the back drop of the old industrial facility. The facility now houses concert halls, museums, heritage tours, restaurants, a pool, an ice skating arena, rock wall, and a park just to name a few.<sup>46</sup> Of the many amenities that are provided, the most prominent are the ice skating arena and the pool, which can be seen in Figure 12 and 13. The ice skating arena is open for a brief period from the month of December to January and for the rest of the time it becomes a pond. What is so intriguing about this feature is the simplicity of the intervention and the amount of people that are attracted to it. This intervention allows people to engage in activity with one another, bringing life to an old industrial site. As mentioned earlier, by Bloomer and Moore, this site appeals to the

Figure 11: Top - Picture of a concert hall within the coal mine complex. Bottom - One of the many restaurants within the complex. Source: Zollverein Foundation n.d.

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<sup>46</sup> Zollverein Foundation. n.d. <http://www.zollverein.de/> (accessed April 15, 2014).

haptic sense by allowing the people the action of physically skating within the space, which creates a different experience than just merely watching people skate.

The other site that gathers attention from visitors is the pool. A simply constructed piece, the main structure of the pool is made of an old shipping container.

Similar to the ice skating arena, the pool offers a more haptic engagement, allowing visitors to participate in the action of swimming and engage with one another in the process.

When looking through the lens of the four design guidelines, it seems that the Motivation for coming to the complex is two-fold: one is for the experience of this

historic site and the other is for the enjoyment of the recreation center. The Physical aspect refers to the amenities provided such as the ice skate rink and the pool as well as the restaurants and theatre. These amenities provide activities for people to engage. Intellectually, being a part of the World Heritage Sites allows people to learn about the history and the importance of the site. Lastly, this complex emotionally ties visitors to it

because there are year-round public activities for all ages and being a historic site, the complex may relate to people who have a sentimental connection to it.

Figure 12: Top - Picture of the ice rink during the off season. Bottom - Picture of the lively ice rink in action. Source: Zollverein Foundation n.d.

Figure 13: Picture of the pool with a beautiful back drop. Source: Zollverein Foundation n.d.

In order to get a better understanding of the design elements within each project, an analysis using the 8 Challenges, discussed earlier in the paper, must also be done. The Zollverein Complex does a good job of addressing the second challenge, which is figuring out how to integrate the design into the existing infrastructure. Being a historic site, this project needed to keep this challenge in mind as they could not majorly alter any of the original complex. As a result, simple solutions adapted to the existing infrastructure, such as the ice rink, which is a collection of water in an existing basin of the complex that freezes over during the winter. Another challenge this project addresses, and one of its most successful aspects, is the fifth challenge of aligning stakeholders and other participants. The complex focuses on elements and activities, which create a family friendly environment, making it more exciting and fun atmosphere, enticing people to want to visit. Lastly, the project also successfully completes the sixth challenge, which deals with the diversity of the situation. There are a variety of amenities and activities that encourages people to visit year round and at various times of the day. As mentioned before, the ice rink encourages people to visit during the winter time, while the pool encourages people to visit during the summer. There are also concerts and restaurants that allows for activities for both night and day.

### 6.1.2 Mobile Dumpster Pool

The Mobile Dumpster Pool is an annual intervention held in Brooklyn, New York right outside of Grand Central Station. The project was thought up by a real estate development group called Macro Sea and is a part of the New York City's annual Summer Streets celebration that takes place over three Saturdays. For the day, cars are prevented from accessing the streets,

Figure 14: Assembly of the pools. The busy street can be seen on the left. Source: Spontaneous Interventions 2014



allowing for complete control by pedestrians. Similar to the previous example, the pools are constructed out of shipping containers. Along with the pool, tents and lawn chairs are also provided, which creates a lounge area that is open to the public.

The intent of this project is on "energizing neglected parts of the urban landscape, favoring the use of everyday objects as building blocks for unexpected experiences."<sup>47</sup>

The intervention offers the general public an amenity, in

this case the pool, which is not as readily accessible.

Figure 15: Busy streets filled with pedestrians admiring the pools. Source: Spontaneous Interventions 2014

This event also opens up the urban landscape to allow citizens to engage with the built environment differently. Pedestrians are able to roam freely around the streets allowing more space for activities and interactions.

What motivates people to flock to this site is the unnatural phenomenon that is occurring in such an urban landscape. Outdoor public pools are an uncommon event, especially one located in the middle of the street in New York. Such an oddity attracts the attention and curiosity of those who encounter it. The site is located in the middle of a closed off street, next to an overpass. Seating areas are also provided; this allows people who are not swimming, to be able to engage just by observing and being a part of the phenomena. Intellectually, people are naturally curious and providing such an oddity invites people to investigate. As a crowd forms, more people will join in and observe, wanting to be a part of this event. By providing this

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<sup>47</sup> Spontaneous Interventions. *Mobile Dumpster Pools*. 2014. <http://www.spontaneousinterventions.org/project/mobile-dumpster-pools> (accessed April 15, 2014).

basic amenity, it brings up memories of past experiences with swimming, beaches, or anything related. As a result, this event then becomes a part of those experiences and emotionally ties people to the mobile pool.

In response to the 8 Challenges, the Mobile Dumpster Pool solves the second and third challenge of its integration to the site and the longevity. The pool is contained within a dumpster that can be easily moved or adjusted and can be set-up and broken down very quickly. As with the Zollverein Complex, this project encourages a family friendly environment, which attracts like-minded individuals and encourages more people to participate in the event.

### 6.1.3 Better Block

The Better Block organization is a worldwide group of people with the goal of revitalizing vacant lots, empty storefronts, and any other form of urban crack. These are quick installations that are typically up for 24-48 hours. Better block leaders work with the owners of the properties in order to allow them the opportunity to install their interventions. The incentive for the property owners is the free publicity because the interventions bring attention to the properties bringing in more revenue and possible tenants. The attention brought as a result of these interventions shows the potential of the space.

The organization works like an open-source program in which they provide guidelines and helpful tips that anyone around the world could use to create their own Better Block. Among the tips are four areas of development in which they suggest people to consider when designing their better block. The first being Safety – the block should be inviting and give pedestrians a feeling of comfort, encouraging them to engage. The second is Shared Access – the site should be easily accessible to the public, allowing pedestrians, bicyclists, motorists, etc. the opportunity to happen upon the space. The third suggestion is Stay Power – not only does the block need to be

attractive, but it also needs keep people within the space. This can be achieved by creating activities in which people can engage with one another. Lastly is "8-80 amenities"/Dog owners – your target audience for a better block should be towards children, dog owners, and the elderly. When other people see this demographic of people within the space it feels more inviting and safe making a person more inclined to participate. Through this four step process the Better Block organization feels that anyone can create a successful better block.<sup>48</sup>

The Better Block movement motivates people to use their space by creating an instantaneous change to a site. These changes instill a sense of curiosity in pedestrian passing by, breaking from the normal perception of the vacant lot. These interventions are, most times, very open and inviting giving pedestrians the notion that they're allowed to participate. By activating this once vacant space, people are able to see the potential of the space thus increasing the chances of the property being used after the intervention is over.

Figure 16: Before and after pictures of better blocks. Source: The Better Block n.d.

<sup>48</sup> The Better Block. *How to Build a Better Block*. n.d. <http://betterblock.org/how-to-build-a-better-block/> (accessed April 15, 2014).

Many of the tips suggested by the Better Block movement directly relate with some of the eight challenges. For example, the first tip is to create a safe environment that gives people a sense of comfort and the fourth tip is to target dog owners and children to create a safe atmosphere. These two tips relate to the fifth challenge of considering your stakeholders. By targeting the demographic of dog owners and children, Better Blocks are able to create that feeling of a safe environment, thus encouraging more people to want to use the space. The third tip of stay power relates to three of the challenges: the first challenge of new interfaces, the fourth challenge of developing content to suit the medium, as well as the seventh challenge of transforming social relations. By creating content that is easily accessible to everyone as well as one that encourages people to break from the social norm allows for a more personable connection for participants, giving a sense of belonging and encouraging them to stay within the site.

#### 6.1.4 Flash Mobs and Free Hugs

In the paper "Revitalization of Public Space: From 'Non-Places' to Creative Playgrounds," Jekaterina Lavrinec gave insight to what "non-places" were as well as a few suggestions as to how the problem could be solved. Lavrinec also mentioned how Flash Mobs and the Free Hugs Campaign were two types of interventions, which helped to give meaning to non-place. As mentioned earlier in this paper, Non-Places are spaces that are filled with human activity, yet not with social interaction. These spaces often give the feeling of loneliness causing people to want to interact less, which in turn creates more loneliness within the space. Unless something is able to break people out of this mindset, this cycle of loneliness will continue and the space will be considered a dead space.

Flash mobs are organized impromptu public displays in which "a group of people summoned (as by e-mail or text message) to a designated location at a specified time to perform an indicated action before dispersing."<sup>49</sup> These performances "take part in forming the

identity of the place and could be considered as an act of place-

making."<sup>50</sup> Flash mobs are typically organized in non-place spaces where repetitive actions of pedestrians occur. These performances help to break people out of their repetitive rituals opening their attention to the potential of the space they frequent yet hardly consider beyond their normative thinking. Even though pedestrians are not physically engaging in the performance, the act of merely stopping to observe the performance is possibly enough to break them from the loneliness of the space and interact with other people.

Figure 77: Example of a flash mob occurring at a shopping mall in which a group of people dressed in loud colored outfits break out into dance. Source: Lavrinec 2011.

Lavrinec also uses the "Free Hug Campaign" as another example of how non-places can be given meaning. The campaign,

"was initiated by Juan Mann in Sydney in 2006, and since that time has been repeatedly arranged in many countries around the world...the inspiration for this campaign was the experience of loneliness he encountered when he arrived to Sydney after being absent for a long period of time: 'Standing there in the arrivals terminal, watching other passengers meeting

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<sup>49</sup> Merriam-Webster. *Flash Mob*. n.d. <http://www.merriam-webster.com/dictionary/flash%20mob> (accessed April 30, 2014)

<sup>50</sup> Lavrinec, Jekaterina. "Revitalization of Public Space: From "Non-Places" to Creative Playgrounds." *Coactivity: Philosophy, Communication*, 2011: Pg 70

their waiting friends and family, with open arms and smiling faces, hugging and laughing together, I wanted someone out there to be waiting for me. To be happy to see me. To smile at me.' To hug me."<sup>51</sup>

The campaign consists of groups or individuals in public settings holding a sign that says "Free Hug," in an attempt to entice a passerby to break away from the trance of getting from point A to B and participate in a bit of social interaction. In the same way as the flash mob, this break away from the normative opens up the participant's

Figure 18: Successful hug! Source: Lavrinec 2011.

perception of both the surrounding built environment as well as the people around them. By breaking up the repetitive actions of daily activities, these interventions are capable of instilling in people new perspectives and attitudes towards their surrounding environment. They become more aware of the other people that are within the space.

Flash mobs motivate people to engage because these are events that extend out of the normal use of the space. They instill curiosity in the observer redirecting them from their normal course of action to watch the event. Typically, flash mobs are conducted by an organized group of people; the coordination and cooperation between all members of the mob determine a successful event. The intellectual stimulation of viewers varies depending upon the event, but most play upon the curiosity of the audience in understanding what is happening. Lastly, these events are typically in good spirit and very ephemeral, leaving the audience with an emotional connection to the event. If they see the event on the news or hear someone talk about it, they can say they were a part of the event.

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<sup>51</sup> Lavrinec, Jekaterina. "Revitalization of Public Space: From "Non-Places" to Creative Playgrounds." *Coactivity: Philosophy, Communication*, 2011: Pg 73

One of the main challenges that the Free Hugs and Flash Mob initiatives address is the seventh challenge, which is about transforming social relations. These events break people out of their normal routines and encourage them to participate with the event, whether it is directly participating, or indirectly by being an observer.

## 6.2 Specific

This next section will begin to look at specific case studies that deal with actual interactive interventions, which are more directly related to the intended outcome of this project. These projects will be analyzed for what elements were used to create the interaction between intervention and person. The use of technology is an important aspect to creating these connections, thus they will be one of the main focus for extracting design elements. The four guidelines of interactive design and the eight challenges will also be used to analyze and develop interactive design elements.

### 6.2.1 Nesting

A simple intervention situated in a barren urban landscape of Newcastle, Australia, the Nesting project attempts to revitalize urban areas through the use of sound therapy. Six "nests" are placed in trees throughout vacant urban areas and are constructed to visually mimic bird's nests in order to blend in with the landscape. Inside each nest is a set of speakers, which have pre-recorded sounds of a busy urban landscape.<sup>52</sup>

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<sup>52</sup> Lehmann, Steffan. "Nesting." In *Back to the City: Strategies for Informal Urban Interventions*, 194-195. Ostfildern: Hatje Cantz, 2009.

These nest then playback the ambient sound of urban life in an attempt to recreate the atmosphere of a busy city. The idea is similar office buildings that use ambient noises (such as the sound of an air conditioning unit) to fill in the emptiness. By creating a busy atmosphere people are less discouraged to use the space because they do not feel like they are alone.

In this project, sound is the major motivational factor for attracting people. Projecting ambient city noises within an empty space creates a phenomenon that instantly grabs the attention of pedestrians. The speakers are hidden within a jumble of twigs to imitate a bird's nest, which allows the installation to blend in with the landscape. Additionally, this nest is located above the level of the pedestrian, forcing them to explore in a three-dimensional space. Intellectually, this installation instills a sense of curiosity, forcing people to explore and discover the space. The installation also forces the participant to notice their surroundings. The participant's ears hear a busy street, but their eyes see that the street is empty, forcing the participant to investigate in order to figure out what is happening. There isn't much of an emotional tie to the installation, or the place other than instilling in a person to be aware of their surroundings.

Figure 19: Image of a nest in a tree with a few curious pedestrians admiring it. Source: Lehmann 2009.

The main challenge, which Nesting deals with, is the second challenge of integration with the site. The key element to the success of this project is its ability to blend in with the site. By integrating the technology with a natural form creates a minimal visual impact upon the site as well as creates a sense of curiosity.



## 6.2.2 Lo-Rez / Hi-Fi

Lo-Rez / Hi-Fi is a private project located in Washington DC created by MY Studio. Unlike the previous project, this project dealt less with space revitalization and more with grabbing the attention of pedestrians, creating a seamless transition between public sidewalk space and private lobby space. Although this project did not specifically deal with revitalizing dead space, the project encouraged participants to interact with one another as well as the interventions.

The project consists of two major elements: the first is a grid of 20 poles and the second is an LED wall. The poles contain LED lights to allow for visibility at night and speakers that emit sounds. Each pole is made up of 4 segments, and each segment emits its own unique tone when touched. "As multiple

Figure 20: Image of the "grove" of poles. Source: MY Studio 2012.

people occupy the grove, an unpredictable choreography of tones makes music within the grove zone."<sup>53</sup> The poles encourage collaboration between multiple people through the arrangement of various tones the poles emit. The second part of the project, the LED wall display catches the attention of pedestrians by reacting to movement. "Organized as a field of pixels/dots which brighten when activated, these interactive light zones are used in different orientations within the project, creating a dynamic display of light that can contain both, information as well as register movement."<sup>54</sup> There are two LED wall displays, which can be seen in Figure 21, one outside, in the middle of the sidewalk and one inside the storefront. The pair of LED

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<sup>53</sup> MY Studio. *LoRezHiFi*. 2012. <http://www.mystudio.us/projects/4> (accessed 15 2014, April).

<sup>54</sup> Ibid

walls are connected to one another, encouraging pedestrians to move from the outside, to the inside.

The installation is located in the center of a large sidewalk, making it extremely difficult for them not to be noticed. These objects are also not typical streetscape objects, encouraging pedestrians to investigate. The poles emit various sounds depending on what section is touched and the screen displays

Figure 21: LED Wall Panel. Source: MY Studio 2012.

information based on the location and proximity of the person. Intellectually, when engaging the poles, a person touches the poles in various locations and understands the various tones being emitted. These poles have the potential of creating various melodies, encouraging collaboration between multiple people.

Unlike many of the other case studies, this installation doesn't really deal with the second challenge. This installation stands alone in the middle of the sidewalk, without much consideration for the surrounding environment, yet it still creates a sense of interest by being an anomaly in the center of a wide, public sidewalk. This project answers the sixth challenge, which is to deal with the diversity of the situation. Each pole creates a different tone at different segments creating a versatile form of interaction, which grabs the attention of the participant.

### 6.2.3 Mapping the City

"Mapping of the City" was a project conducted by a group of artists in the city of Hull, England. The goal of this project was to create "site-specific immersive performance staged in a city setting (that) can provide a useful testing ground for the development

of innovative research apparatus designed to elicit public perception and conception of urban conditions."<sup>55</sup> The idea for the project was to create a series of live performances throughout the city forcing participants to walk through and experience the urban environment. "These often-forgotten urban interstitial spaces await new or renewed identities and imaginative interventions to bring them back to the public realm of the city."<sup>56</sup> Each performance took place within an interstitial space and was site-specific, using the surrounding area to open up the audience perception of the space. At the end of the performances, the audience was asked to take a survey and "map the city."

From this survey, three major themes emerged:

*Framing*, in which the performance romanticized the space and showed the potential of what could be changing the perspective of the viewers. *Sensory Experience*, during the

performance audience members were given

headsets, which gave auditory inputs during the performance creating a more immersive experience. *Demographic*, preconceived feelings towards the space varied from local to non-local audience members.

Figure 22: A map created by one of the audience members. Source: Park and Peng 2013.

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<sup>55</sup> Park, Adam, and Chengzhi Peng. "Mapping Interstitial Urban Spaces through Performing the City." *Leonardo*, 2013: Pg 490

<sup>56</sup> Ibid

Through this project it was noted that "site-specific performance has the potential to change the way the people think about and perceive the city."<sup>57</sup> By immersing people in the performance, audience members perceive the space as it is seen through the lens of the performance and not its actual state. Another important point was made about the survey; it was not enough to create a post-survey in order to analyze how people felt about the space. Real-time analysis of audience members are needed in order to fully understand how they perceived things.

This exercise acted like a game which helped to motivate people to participate in this project. People went on a scavenger hunt to find the various performances, armed with auditory input devices to guide them and create a more immersive experience. Each performance was carried out by actual people and was in response to each specific site. The intellectually stimulating part of this project was the engagement of audience member to performers as well as the survey feedback given at the end of the exercise. Lastly, depending upon the demographic, the audience member created an emotional bond to each space through observing each performance.

The main challenge this process addresses, like other, is the second challenge of site integration. The purpose of this project is to create site specific performances to inform the participants of the space. Another challenge the project addresses is the fifth challenge of addressing stakeholders. This is done by creating the evaluation forms after the performances because they create an immediate feedback between project and participant. Through these surveys the artists noticed a difference in perception based on whether or not the audience member was local or non-local to the area.

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<sup>57</sup> Park, Adam, and Chengzhi Peng. "Mapping Interstitial Urban Spaces through Performing the City." *Leonardo*, 2013: Pg 491

## 6.2.4 White Noise White Light

The “White Light White Noise” project was a temporary installation designed for the Athens 2004 Olympics.<sup>58</sup> The project consists of a “50' x 50' grid of fiber optics and speakers,” each of the flexible fiber optic tubes transmits a light creating a grid of point lights across a

plaza space.<sup>59</sup> “As pedestrians enter into the fiber optic field their presence and movement are traced by each stalk unit, transmitting white light from the LEDs and white noise from the speakers bellow.”<sup>60</sup> Each fiber optic detects the presence of a pedestrian within the grid of lights. Kinetically, each

tube wave as a person comes into contact with it, changing the visual

dynamic of the grid. Even when surrounding light levels are low, the installation stands out and defines the pace with its illuminated point light grid system. One can still observe someone, without seeing them, by tracking the movement of the light and sound of the white noise coming from each unit.

The motivation to interact with this installation is the gridded fiber optic lights, which is a foreign object in the open plaza space. The physical nature of the piece consists of fiber optic tubes, which emit a light depending on the proximity of a person to each

Figure 23: People interacting with the installation. Source: MY Studio 2004.

Figure 24: Tracking motion of pedestrians through darkness. Source: MY Studio 2004.

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<sup>58</sup> “White Noise / White Light,” *Architizer*, accessed March 3, 2015, <http://architizer.com/projects/white-noise-white-light/>

<sup>59</sup> MY Studio. *White Noise White Light*. 2004. <http://www.mystudio.us/projects/3> (accessed 3 3, 2015).

<sup>60</sup> Ibid

individual piece. At each tube is a speaker, which emits white noise as a person gets near, alerting their presence to anyone around. Intellectually, people are able to observe other people moving within the space as well as make their own presence known. Emotionally, this installation emulates a pseudo-urban meadow allowing people to frolic within the field of lights. It empowers people to create an immediate impact upon the space and the built environment around them.

White Noise White Light really focuses on the first challenge, which deals with how people interface with the project. The participants connect to the installation through haptic and auditory interactions by physically moving each tube and making their presence known through the white noise. Similar to the Lo Rez/Hi Fi project, this project is a standalone installation in the center of the plaza creating a greater sense of interest by standing out amongst the rest of the built environment.

### 6.2.5 Lightswarm

Future Cities Lab is an architecture and design firm based in San Francisco whose expertise is in the development of interactive installations relating to the social connection between people and the built environment. In October of 2014 they designed a skin installation in the façade of the

Figure 25 – Individual modules of Lightswarm. Source: Future Cities Lab, 2014.

Yerba Buena Center for the Arts called, "Lightswarm." This installation piece consists of 450 individual, undulating, modules (as seen in Figure 25), which are all suspended in the glass façade of the building and each module lights up allowing interaction from both inside and outside. A series of sensors are fixed to the glass of the façade, capture sound from both the inside and outside environment. Each of these pieces

collectively responds to ambient sounds within the immediate area and a swarm of light responds to areas that contain the most noise.

Figure 26: Exterior view of Lightswarm. Source: Future Cities Lab, 2014.

This installation is successful in that it engages multiple senses at one time sight – the changing in color and movement of light catches your eye, sound – noise is what activates the piece, and touch – from the outside you can tap on the glass and the pieces pick up the vibrations from window. In this way , participants are able to physically engage with this piece and be immersed within it. Simultaneously they are engaging in the overall space by activating these light patterns and changing dynamic and composition of the installation.

Figure 27: Interior view of Lightswarm. Source: Future Cities Lab, 2014.

Light swarm motivates pedestrians and art center visitors to engage the façade as well as each other by using a dancing particle of light across each of the modules and, subsequently, across the façade of the building. Physically, this is achieved through the 450 modules, hung within the façade, that are individually lit, as well as the series of sensors across the façade that pick up various levels of sound. Depending upon the location of the sound determines the location of the particle of light. Intellectually, pedestrians would pass by the façade and notice the light dancing across the façade, shadowing their movement. The dancing light piques the interest of the pedestrians who might stop or move closer to investigate. Lastly, this installation gives people a

sense of empowerment as they are able to influence the entire façade of the building through their own actions. The dancing light also creates a sense of happiness and calm inviting people to continue to return.

In regards to the eight challenges, Lightswarm deals with challenges two and three very well. In response to the third challenge, which deals with the longevity of the project, there is an understanding that the project is temporary and has a life span of two years. As a result, this informs the design of the project to answer the second challenge, which deals with how the intervention is integrated within the project. Individual frames are tension fitted within each module of the curtain wall mullion system. This allows for a minimal impact upon the existing structure and easy removal, or adjustment, if necessary.

The focus of this section was to collect a series of case studies, which related to the revitalization of dead space. Each case study was analyzed using the interactive design guidelines (Motivational, Physical, Intellectual, and Emotional), as well as the eight challenges of media façade design. Through this analysis, several common elements between each case study were collected and will be discussed within the next section.

## 6.3 Interactive Design Elements

These case studies provided a wide range of design interventions, all with a similar purpose of creating a more socially vibrant space. After analyzing each one in regards to the interactive design guidelines and the eight challenges, common elements of interactive design become present.

Motivation – Dealing with human senses in order to gain the attention of pedestrians.  
The primary senses to focus on would be sight and sound and the



secondary sense to consider would be touch. Create an unnatural phenomena that works well with the building (both functionally and visually), yet stands out enough to be noticed. Use movement as a way of activating the space as well as grabbing the attention of the pedestrian.

Physical – Use lights in order to visually stimulate and attract people and use sound to back up the function of the light. Sensors are needed to collect the proximity of people to the intervention. These sensors become the connector of people to the built environment, creating a relationship between the two.

Intellectual – Design the installation in a way that instills a sense of discovery and exploration thus keeping the attention of the user. Give the installation a deeper purpose such as informing the user of the dead space. Relate the installation not just to the dead space it is revitalizing, but also the surrounding built environment and stakeholders.

Emotional - Allow the person to immediately impact the installation in order to give the person a sense of contribution or belonging to the piece. This will empower the participant, giving them the notion that they are able to design and influence the space that they are in. The piece should be adaptive enough to allow the person to create a new experience each time they visit the space.

These four guidelines will become the major focus in deriving a design for this project. Not all challenges were touched upon by each project, but there were many commonalities between some of the challenges and the four guidelines, thus, when designing, many of the challenges will be addressed within each of the four guidelines. For the process of revitalizing dead spaces, most important of the challenges is the fifth challenge with deals with aligning stakeholders and other

interests. This is because the people or participants are the ones who will make the space come alive, thus much attention must be given to this factor when designing. Stakeholders are a unique factor to each site and by focusing the design towards these stakeholders the intervention will also become unique and contextually grounded, creating a more meaningful experience. As a result these two elements (the four guidelines and the stakeholders) will be cross referenced in order to develop a Design Matrix that will inform the design. This Design Matrix will be discussed at a later point in this paper, but for now, with this base of research and these elements established, the preliminary design portion of this project can begin.

# Chapter 7. Design Scheme

## 7.1 Goals

Through the research that has been conducted there is a problem of dead space within the urban landscape. These spaces become scars within the urban environment continuing on unused and unwanted creating areas that are possibly unsafe and unsanitary to the general public. These spaces are so ingrained within the urban fabric that it is difficult and expensive to breakdown or renovate them. Thus the uses of smaller, temporary interventions are more fitting for these spaces as they are quick to install and cheaper to build. The use of Interactive Architecture has been proposed as a way of designing that allows everyday people to be able to influence the built environment. This type of architecture gives power and responsibility to the users of the space/building to take care of it. Lastly, we have come across a set of guidelines that help to inform interactive design. These guidelines were used to analyze a series of case studies in order to come up with some common elements within interactive design.

The next step in this project's process is to put these elements into practice in order to test whether or not it is plausible for design. In order to do so, a series of real world sites, which fall under the category of dead space, must be collected. After narrowing down the collection of sites to one, research will be conducted to determine the cause of the condition and implement a design. The goal of this project is to test the design matrix in the hopes that it can be used for any site.

## 7.2 Space Typologies

From researching the various definitions of dead space and analyzing the pros and cons of the case studies, three spatial typologies can be derived. The first type, Type 1, deals with interstitial spaces, as defined by Sankalia. These interstitial spaces are functional pathways, which have the potential to allow for more usage of the space. The general goal for Type 1 spaces would be to enhance the space by creating a more inviting appearance. Another goal would be to inform pedestrians of the potential of the space as an accessway. Type 2 spaces deal with existing infrastructures that have been abandoned. These spaces leave traces of previous infrastructure and become scars, giving the feeling of an unsafe environment. The general goal for this type will be to utilize and perpetuate the existing infrastructures while revitalizing the space. The intervention should show the potential of the space, encouraging others to take responsibility over them. Lastly, Type 3 spaces deal with non-places. These spaces are highly trafficked by people, yet hardly contain any form of social interaction. For these spaces it will be important to break away from the repetitive actions that exist within the space, by creating events that grab their attention, in order to give the space a chance to allow for social interactions. By creating this break, people will be willing to interact with not only the space and the built environment, but also other people. With these three spatial typologies in mind, the next step is to go out and find real-world examples of each.

## 7.3 Site Considerations

For this project, it is ideal to choose a site that is familiar and one that is easily accessible in order to gather data. Therefore, the search of possible sites were narrowed down to the "urban fabric" of the University of Hawaii at Manoa. Located on the island of Oahu, the UH Manoa campus is a public school with over 19,000

students enrolled in the Fall 2014 semester with a campus size of about 320 acres.<sup>61</sup> The buildings on campus are spread apart and by no means densely packed like a typical urban city environment, yet traces of these dead spaces can still be found throughout campus. After extensively exploring the campus, a series of potential sites for each category were gathered. Places that were along major pedestrian pathways, or directly adjacent to them were heavily considered. Along with that criteria, places with existing infrastructures, for example, places with buildings adjacent to it, not sites that stand completely separated from existing infrastructures, were also considered.

### 7.3.1 Type 1: Interstitial Space

Type 1 refers to interstitial spaces adjacent to buildings. There are many spaces like these on campus, but the goal was to find interstitial spaces that were unused and located near

heavily trafficked areas. Located near the center of campus, next to the newly built Warrior Recreation Center (WRC), lies Type 1A (displayed in Figure 28). This site consists of an accessibility ramp fitted in between the main Campus Road and the WRC. The ramp is located on the back side of the WRC building, opposite of the main entrance. While there is a pedestrian within this picture, the majority of pedestrians were taking a different route. Being in the center of campus, this site



Figure 28: View of Type 1A access ramp



Figure 29: View of Type 1B from main pathway

<sup>61</sup> "Fast Facts," *University of Hawaii at Manoa*, 2014. accessed September 29, 2015. [http://manoa.hawaii.edu/miro/wp-content/uploads/2014/11/FastFacts2014\\_Page\\_1.jpg](http://manoa.hawaii.edu/miro/wp-content/uploads/2014/11/FastFacts2014_Page_1.jpg)

offers a lot of potential, despite its current state as a dead space, to be intervened and revitalized.

Type 1B is also located near the center of campus. Tucked away off the main path that leads from the main bus stop, to one of UH Manoa's major libraries, lies a pathway (seen in Figure 29) that leads to a little seating area (seen in



Figure 30: View of Type 1B seating area

Figure 30). This pathway fits alongside the library and the seating area is closed off and faces towards the bottom floor offices of the library. This unused pathway and alcove offers a potential for intervention because it is directly adjacent to a prominent building on campus and already contains infrastructure (i.e. the seating area) that could be easily retrofitted to entertain the visit of any passerby.

### 7.3.2 Type 2: Urban Cracks

Type 2 relates to "Urban Cracks," or existing infrastructures that are abandoned or not well used.<sup>62</sup>

Type 2A, displayed in Figure 31, is located along the main pathway that leads to one of the main libraries on campus. This site is a set of planter boxes with seating areas



Figure 31: View of Type 2A seating area

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<sup>62</sup> Jones, Peter Blundell, Doina Petrescu, and Jeremy Till. *Architecture and Participation*. London: Spon Press, 2005. Pg 58

indented into them. This site was obviously intended to entertain groups of students, yet now it is left vacant, possibly due to the fact that it is in the middle of the walkway, putting its occupants on display, giving them an uncomfortable feeling.



Figure 32: View of Type 2B

Type 2B is located near Type 2A, just off of the main pathway and can be seen in Figure 32. 2B consists of 3 concrete pads where a series of benches used to be located, creating a nice little seating area. These benches would typically house the smokers of

campus, giving them an area to smoke

before their next class. For reasons unknown, these seats were removed from the area and all that is left are these concrete slabs. As a perfect example of an "Urban Crack," this abandoned seating area contains much potential because it is adjacent to a major accessway, contains existing infrastructure and has an appealing tree garden.

Last of the Type 2 category sites is Type 2C, seen in Figure 33, an indented seating area located on a newly built pathway adjacent to the newly constructed Information Technologies Center. This seating area is unprotected



Figure 33: View of Type 2C

from the elements, provided

no shade or protection from the frequent rains showers of the Manoa valley. The site is also very open, resulting in no privacy or sense of protection for the occupants.

### 7.3.3 Type 3: Non-Place Space

Type 3 consists of “non-place” spaces.<sup>63</sup> These are spaces that contain heavy amounts of foot traffic, yet very little social interaction. Type 3A, seen in Figure 34, is located at the center of Campus Center on the other side of the Warrior Recreation Center from site Type 1A. The site is a large courtyard or plaza space with



Figure 34: View of Type 3A courtyard

a large tree in the center of it. There many benches located within the grassy portion of the plaza as well as several pathways and pavers to accommodate pedestrians walking through. This plaza is a major thoroughfare as it is the central focal area of campus. The site becomes a launching point where people could go to any number of classroom buildings, campus center, the WRC, or the parking structure and lower campus. This transient space is filled with people walking through from point A to point B with very little social transactions.

Last, is site Type 2B, which is displayed in Figure 35. Located on axis with the main quad on campus the site is a major promenade that connects major administrative buildings on campus with the main library



Figure 35: View of Type 3B, a major promenade on campus

<sup>63</sup> *Urbanized*. Directed by Gary Hustwit. Performed by Jan Gehl, Amanda Burden and James Corner. 2011.



on campus. Along the walkway are a several buildings flanking either side, each housing majors such as Biology, Physical Science, Art, and Nursing to name a few. This makes it a busy pathway for students going to and from classes creating a major non-place space. Figure 36 displays the various locations each picture was taken.



Figure 36: Site Plan showing the location of each picture.

To further refine site considerations, the decision was made to filter each type down to one selection each and as a result Type 1A, the access ramp, Type 2C, the newly constructed barren seating area, and Type 3A, the Campus Center plaza space were chosen. These sites proved to have the most potential as they are along major pathways and near important buildings, which would be easier to attract people. From these three, further refinement was done to narrow down the selection to one site for the overall project. Type 2C was too small of a site and not appropriate for this project and Type 3A was too popular to need a design solution as much as the other site. As a result Type 1A was chosen to be the site for this

project as it fit the criteria for dead space and had the most potential to be revitalized because it bridged the gap between two major pathways and is adjacent to an existing building.

## 7.4 Site Analysis

As mentioned above, the chosen site is located near the center of campus, bridging two main pathways. The site is an access ramp, which runs between the back side of the Warrior Recreation Center and the Campus Road. Figure 37 shows a site plan encompassing the main section of campus. The building in blue in the center is the Warrior Recreation Center where the site is located.

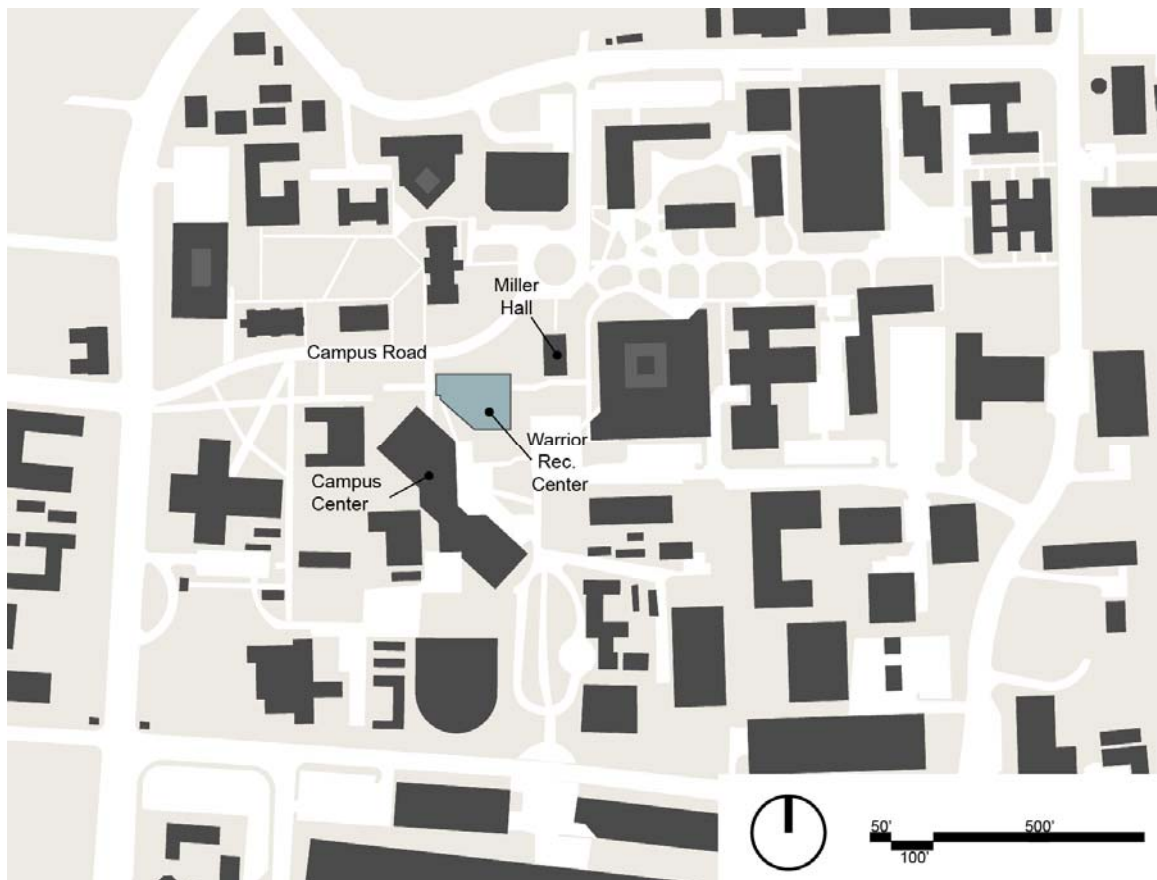


Figure 37: Site Plan of the UH Manoa Campus

The ramp is located on the northern side of the WRC adjacent to Campus Road and Miller Hall as highlighted in blue in Figure 38. The top of the ramp starts at the corner nearest Campus Road and drops down about ten feet towards Miller Hall. The Recreation Center has a large curtain wall system overlooks the site, which can be seen in Figure 39. At the bottom of the ramp, nearest Miller Hall, closer to Campus Road is an open grassy area with a canopy of trees overhead, providing natural shade (this can be seen in Figure 40). Lastly, Figure 41 shows the bend in the pathway, which is on the East side of the WRC and continues towards the plaza space of Type 3A. Figure 42 shows where each of these pictures were taken from, giving a better understanding of the site.

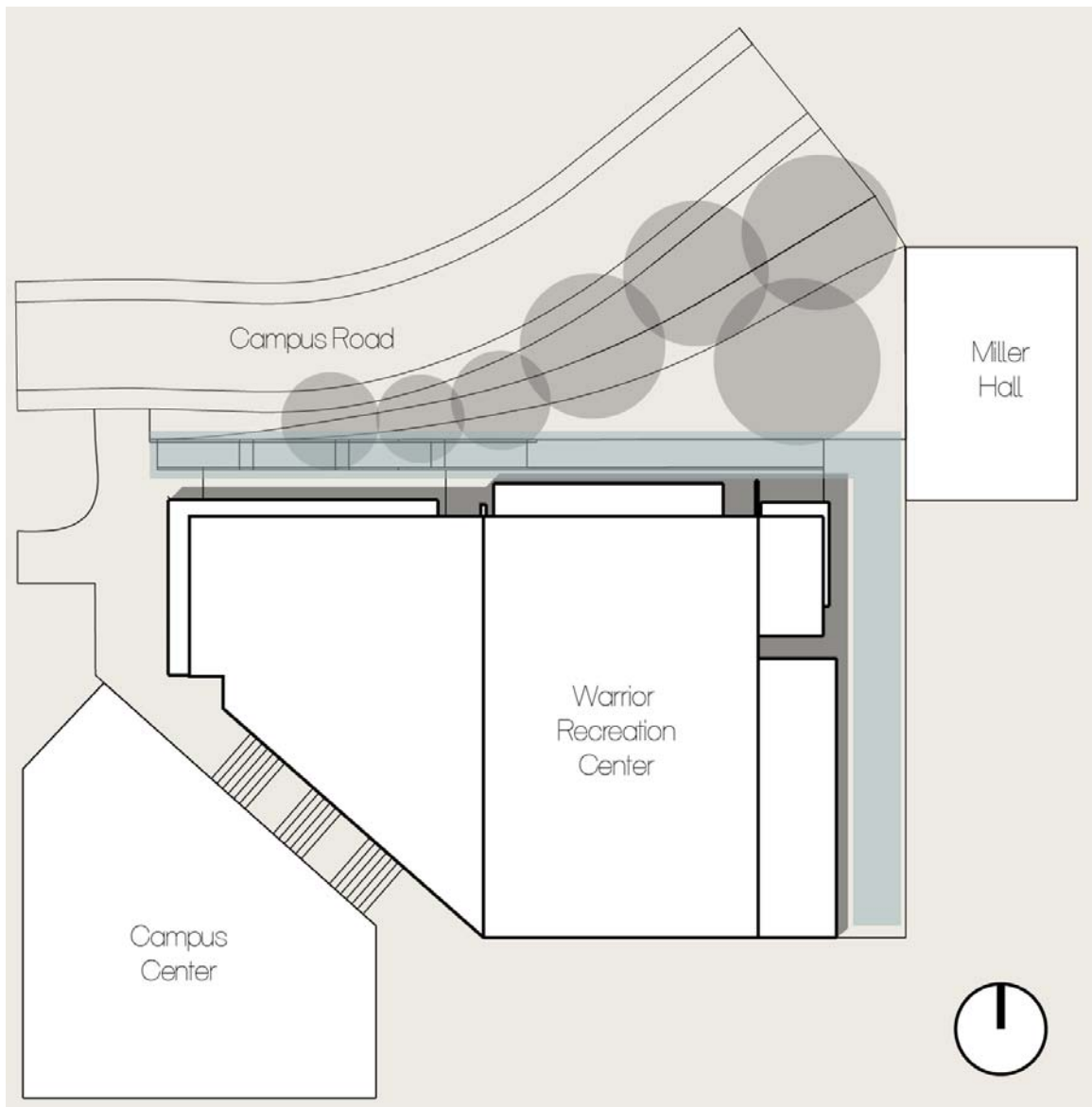


Figure 38: Highlighted view of access Ramp



Figure 39: View A. WRC North façade curtain wall overlooking ramp



Figure 40: View B. Open grassy area at the bottom of the ramp



Figure 41: View C. On the left side of the image shows the bend in the pathway, while the right shows the ramp.

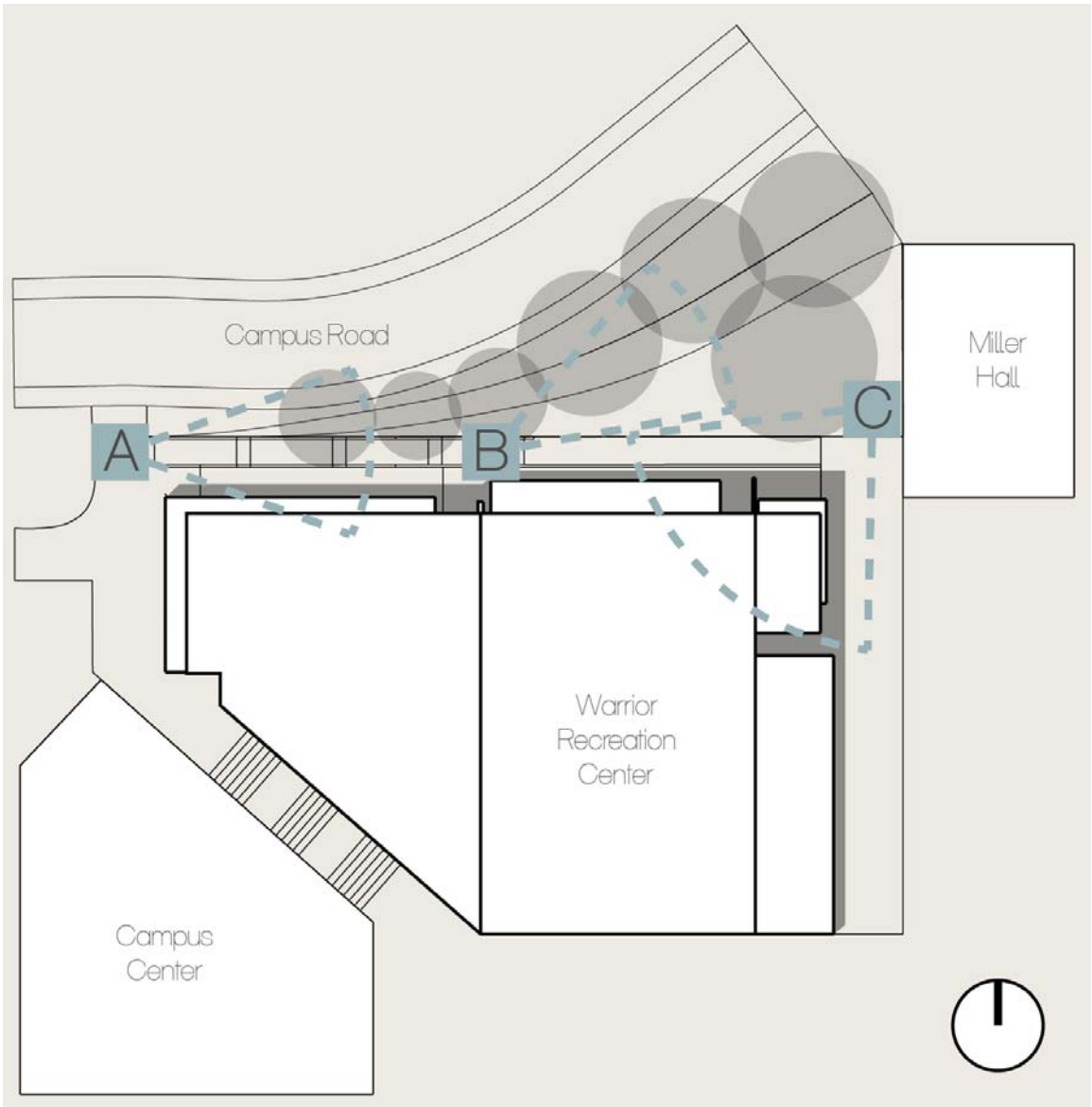


Figure 42: Location where pictures were taken.

One of the main reasons why this site was chosen was because during initial observations, this ramp was not being used as much as any of the other pathways it was adjacent to. Yet, before the design process can continue, more analysis is needed to support the claim that this is a dead space. The first thing that needed to be done was to identify all of the pathways within the immediate area. Figure 43 shows a diagram of the two major pathways. Pathway B is the ramp that is located on the site, and the pathway that is the main focus of intervention. Pathway A is a major pathway, which goes from Campus Road, towards Campus Center and in between the Warrior Recreation Center. Pathway A and the pathway B have the same destination points making them competing pathways.

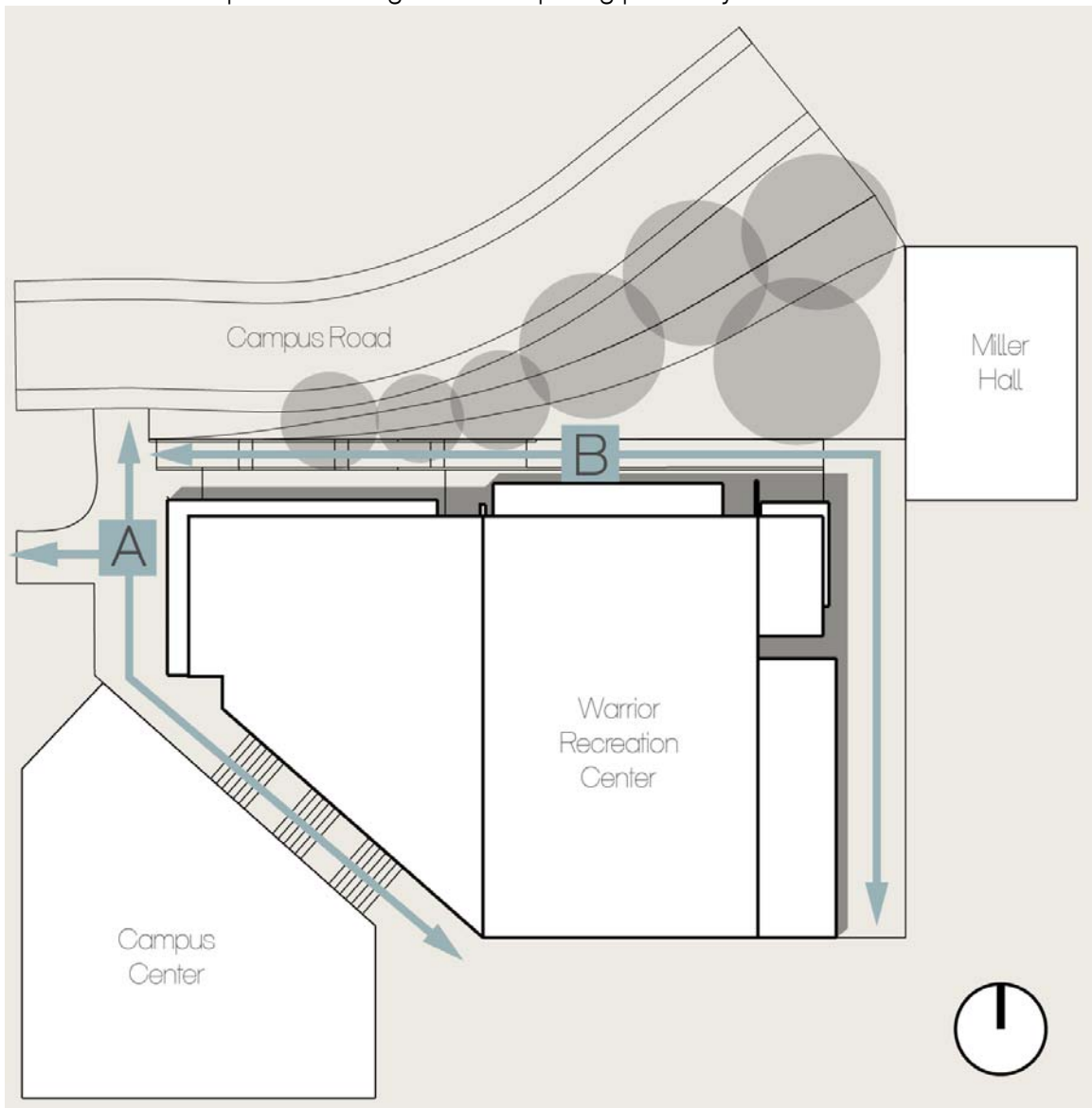


Figure 43: Plan showing all of the pathways near the site.

The initial hypothesis was that more people take path A than path B, which is partially why path B is a dead space. To determine this, a circulation analysis was conducted for the site to observe the amount of people that use each path. This analysis was done on a Monday, Wednesday, and Friday, for an hour during two busy times of the day, which is Noon or lunchtime, and 4pm, which is when most jobs and classes end. Over the course of the week data was collected, which counted the number of people along the paths and taking note of their direction. Around lunchtime an average of 758 people passed through these two pathways. Out of that total, only an average of 33 people used pathway B, which comes out to about 4%. During the afternoon, from 4pm to 5pm, an average of 478 people passed through the pathways. Out of that amount, an average of 17 people used pathway B, which equates to about 3.5%. Figure 44 is a diagram that shows the amount of people and the pathway they to, which is represented with the blue lines while Figure 45 shows the same information, but broken down based on the days of observation. Figure 46 shows the number of people who passed through each path as well as the time and days.

After gathering the information and compiling it, there was a pretty definitive outcome showing that pathway A was indeed a more popular route. Another observation is that Path B is an accessibility ramp that was built during the same time as the WRC,

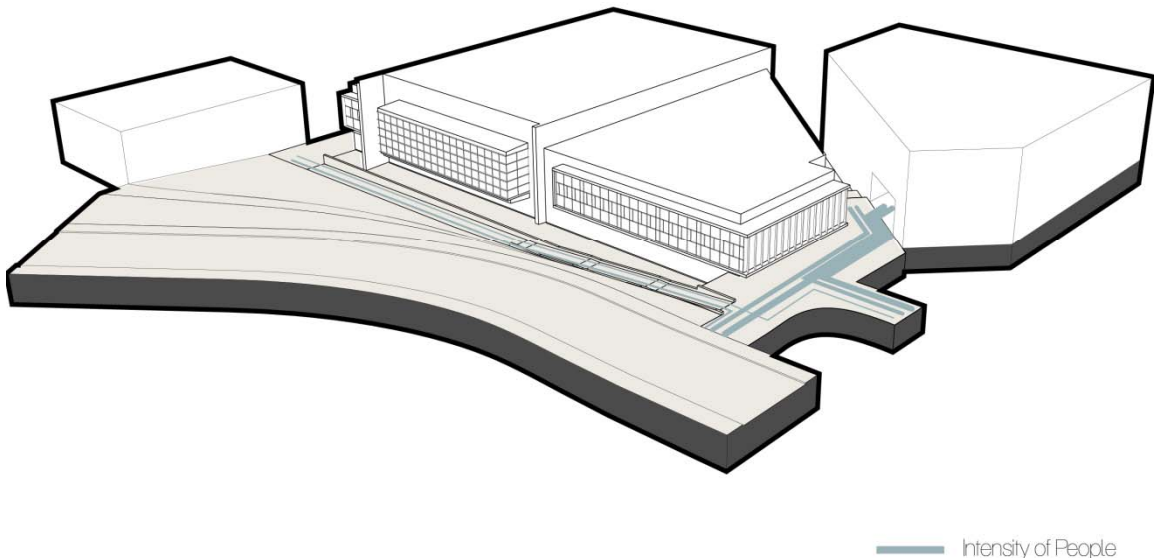


Figure 44: Collective diagram showing, blue lines indicating the frequency of the path.

and probably implemented as code requirement. Due to the size and location of the WRC, it would have been difficult locate this ramp along path A, and it was more feasible to put the ramp in its current location. As a result of this ramp being an interstitial space and that the space is devoid of pedestrian traffic as well as social interaction, the site can be considered a dead space. Now that the site is understood as dead space, this project can start the design process.



Figure 45: Individual diagrams showing the various times and data. On average, 95% of people took the main path while 5% took the ramp path.



# Circulation Analysis

	<i>Mon. 12pm-1pm</i>	<i>Wed. 12pm-1pm</i>	<i>Fri. 12pm-1pm</i>
<i>Pathway A</i>	703	748	726
<i>Pathway B</i>	35	25	38
	<i>Mon. 4pm-5pm</i>	<i>Wed. 4pm-5pm</i>	<i>Fri. 4pm-5pm</i>
<i>Pathway A</i>	435	423	525
<i>Pathway B</i>	12	18	20

Figure 46: Data break down showing the amount of people within each path.

## 7.5 Design Matrix

The research at the beginning of this paper discussed the four step interactive design guideline as well as the eight challenges of media façade design, which have been used to analyze the case studies. From this analysis, common elements of interactive design were observed as well as the importance of identifying stakeholders. While the interactive design guidelines help to develop an interactive design, the addition of stakeholders helps to give the design context. In order to incorporate stakeholders into the design guidelines, a matrix was created to cross-reference each step of the guideline with each of the stakeholders.

When considering stakeholders one must consider the context and the setting of the site. Being on the UH Manoa campus, the first stakeholder for this site would be UH Student and Faculty members. Majority of the people on campus would fall within this category, making it one of the major focuses for design. The ramp is an accessway thus the second stakeholder in this project are pedestrians. The site has similar end points as path A therefore it is plausible to divert some of the traffic from path A to the site. Lastly, the site is directly adjacent to the Warrior Recreation Center, which means the third stakeholder will be gym patrons. The second floor of the WRC overlooks the access ramp, which means the relationship of the interior of the gym and the ramp outside needs to be addressed.

Once the stakeholders were determined, it was time to develop the design matrix by analyzing each stakeholder with the design guidelines. A condensed version of the design matrix can be seen in Figure 47. For Student and Faculty stakeholders, the motivation to use the space would be to gain some sort of knowledge or information. This information could be about news of the school, a message board for people, or a way of giving feedback to the school. In order to carry out this motivation, the physical aspect would need to contain some sort of screen, or display interface to allow people see the information that is motivating their interest. Intellectually, these screens

would display real time information encouraging people to not only use the space, but to stay within it and return for updated information. Lastly this display of information will keep the stakeholders in the loop of information going on around campus, creating a connection between stakeholder, school, and site.

## Design Matrix

	UH Student/Faculty	Pedestrian	Gym Patron
1. MOTIVATIONAL	Information, School News, Student Feedback	(Encouragement) Movement, Light as a Form of Intrigue	Visual Motivation/ Distraction for People Exercising, Activity of Gym on Outside Shows Perspective
2. PHYSICAL	Touch Screen, Display Lights, Phone App.	Kinetic Facade that is Influenced by Pedestrian within Transient Space	Apert of the Facade, Both Outward and Inward Influenced, Light to Simulate Heart Beat
3. INTELLECTUAL	Current Events (Ka Leo Headlines, Weather, Sports, Concerts), Suggestion Box	High Traffic Times Pointing Out Alternative Routes	Knowing of Intensity of Exercise, How Active the Gym is
4. EMOTIONAL	Connectedness Through App./Retreat Space, Transient Space VS Retreat Space	Connectedness Through Person and Form, Provide Information	Helps Motivate Workout, Imprint Apart of Yourself on the Facade

Figure 47: A condensed design matrix showing the relation of design guidelines to stakeholders as well as to each other.

Pedestrians would be considered people who are traveling to a specific destination. These pedestrians have no intentions of stopping, but the objective would be to encourage them to use the ramp as an alternate route. Motivationally, the goal would be the idea of movement; these pedestrians are on the go, and by developing an intervention that mimics this characteristic, both in form and function, could attract people. Physically, the installation should be kinetic and use lights in order to mimic this idea of movement and entice people to enter the space. On an intellectual level the installation could inform pedestrians of high traffic times on the main pathway, offering a faster alternative for their commute. Finally, by mimicking the journey of the

pedestrian and encouraging this idea of movement, the person and installation become connected. Thus if the journey is a pleasant one, then pedestrians will more likely use the route again.

Our final stakeholder is the gym, or more specifically, the gym patrons. The uniqueness of this stakeholder is that they blur the boundaries between the outdoor and indoor space. It is possible for gym patrons to be able to experience the intervention from the outside, as they are going to the gym, and from the inside as they are working out. This relationship can be accomplished through the use of a façade design, utilizing the curtain wall that overlooks the ramp as the mediator between the inside and outside. The façade has a very large visual impact from the ramp, which can be used as a display for attracting gym patron's attention. When looking into the motivation of the gym patron, there are two forms of motivation. The first is by literally motivating them through using the installation as a way displaying the intensity of their work out. This display will then motivate people within the gym to push their workout creating a distraction from the possible burden of exercising. This display of activity will subsequently inform people outside of the gym about how active the gym is and create a second form of motivation to going to the gym. Physically, this can be accomplished through lights and by using frequencies of light patterns as a way of showing the intensity of people's workouts, which will concurrently inform people outside of the gym of how active inside is. Intellectually, people will be able to know how hard they're working out, which may help to motivate them to work harder or slow down. Through this action, people are imprinting and influencing apart of the façade creating an immediate connection between person and built environment. This playful display of lights takes away some of the burden of exercising and will encourage people to return and use the gym again. With all of the stakeholders identified and elements, to be included in the design, considered, the main portion of the design phase can be started.

## 7.6 Design Development

The design matrix helped to identify several elements of interactive design (such as usage of lights, kinetic movement, display interfaces, etc.) that could help to inform parts of the design. Yet it also created an understanding that there would need to be more than one type of space in order to accommodate each stakeholder. The Student and Faculty stakeholder required a space that allowed them to slow down and take in information, while the pedestrians required a space with the sole purpose of moving through the space, and the gym patron has an existing space, but this space connected to the site and needed to be addressed.

To accommodate for these different needs, the site was split into two different spaces: a "Transient Space," and a "Retreat Space," which can be seen in Figure 48. Through this break down of spaces two separate installations, that related to one another in both form and function, were designed. The first installation was a "skin" design that fit within the façade of the WRC. One of the most prominent features of the space is the overlooking façade of the WRC, which has a large area that can be seen from a far. As a result, it is important that this feature be utilized as a way of grabbing the attention of participants. Also, because the façade is a curtain wall, meaning it is a transparent glass wall, the skin is able to easily relate to both the ramp space as well as the interior gym space.

The second part of the design consists of a wall and canopy feature, that travels along the transient space and defines the retreat space, connecting the two in completely separate spaces. This structure extends the entire length of the path and finishes on the East end of the WRC. Figure 49 shows the plan of how the skin and wall are laid out on the site, as well as the extent of the wall system. Figure 50 is an exploded axonometric view of the gym and the installations, giving the first glimpses of the installation as a three-dimensional form.

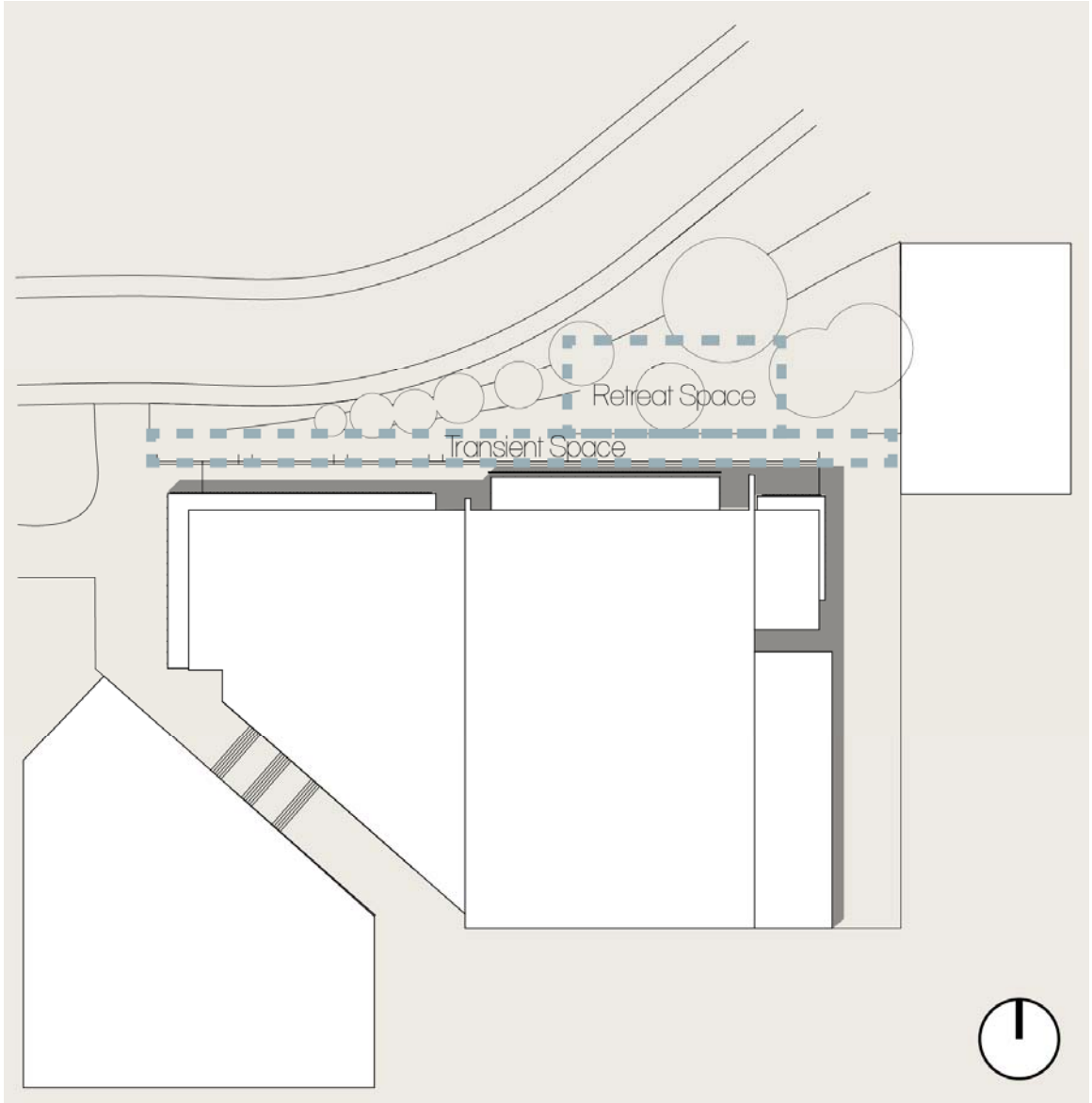


Figure 48: Diagram showing the break-up of Transient and Retreat Space

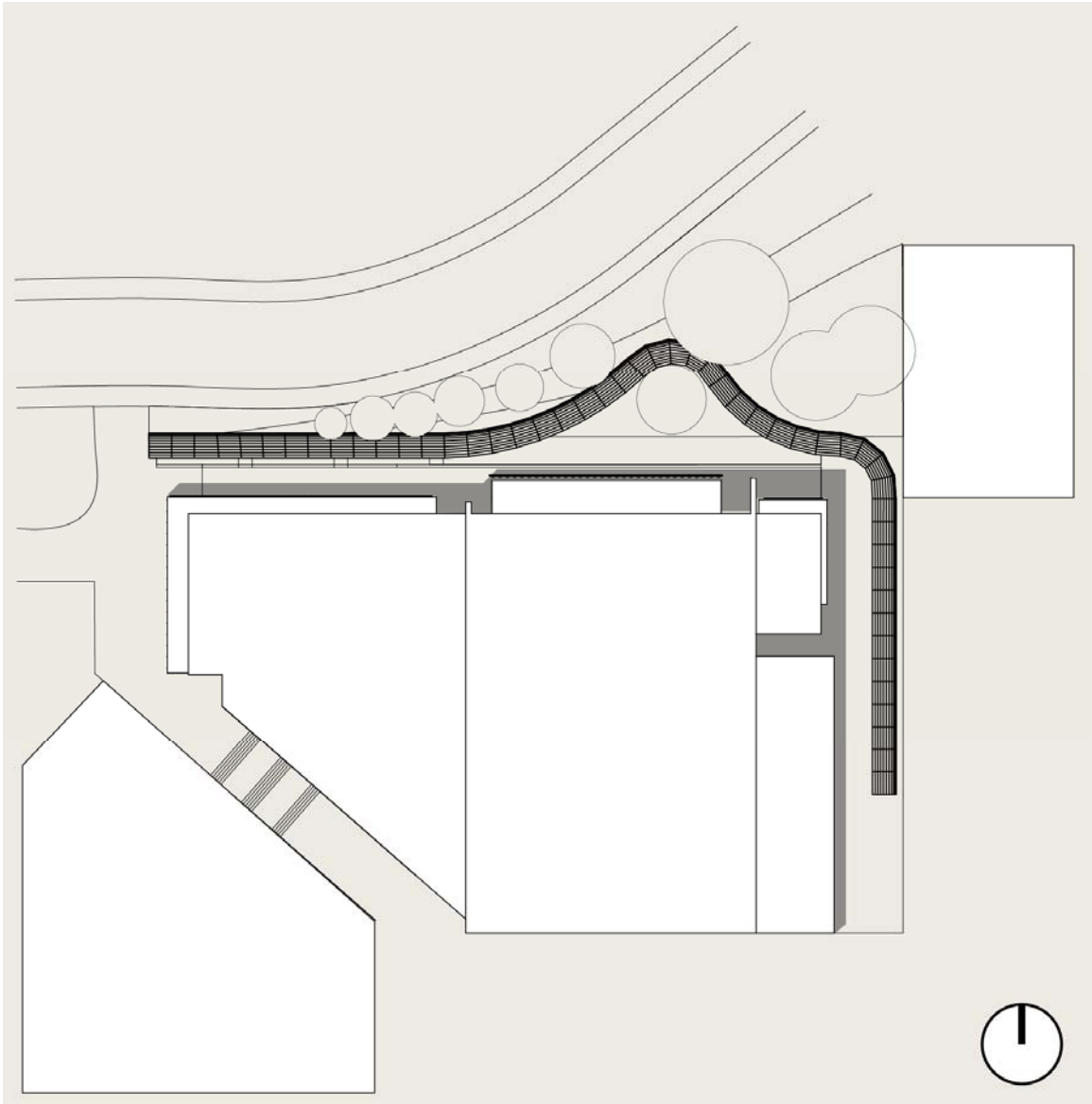


Figure 49: Plan view of the skin and the wall.

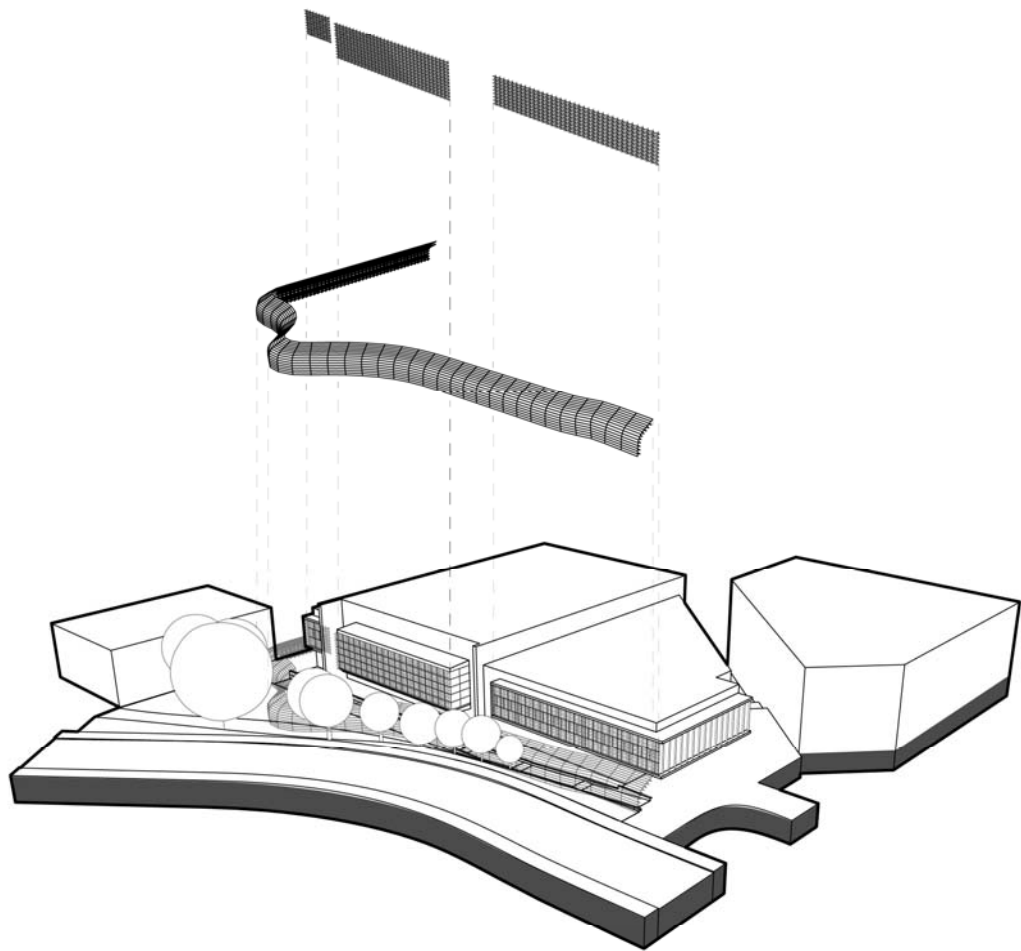


Figure 50: Exploded axonometric view of the two installations



The skin was the first element to be developed as it accommodated two stakeholders and can be seen in Figure 51. The initial factor to consider when designing the skin was to preserve the transparency of the façade. The façade faces North, which helps to bring natural light into the gym as well as give views to the outside. With this in mind, a pattern was designed to allow for some permeability

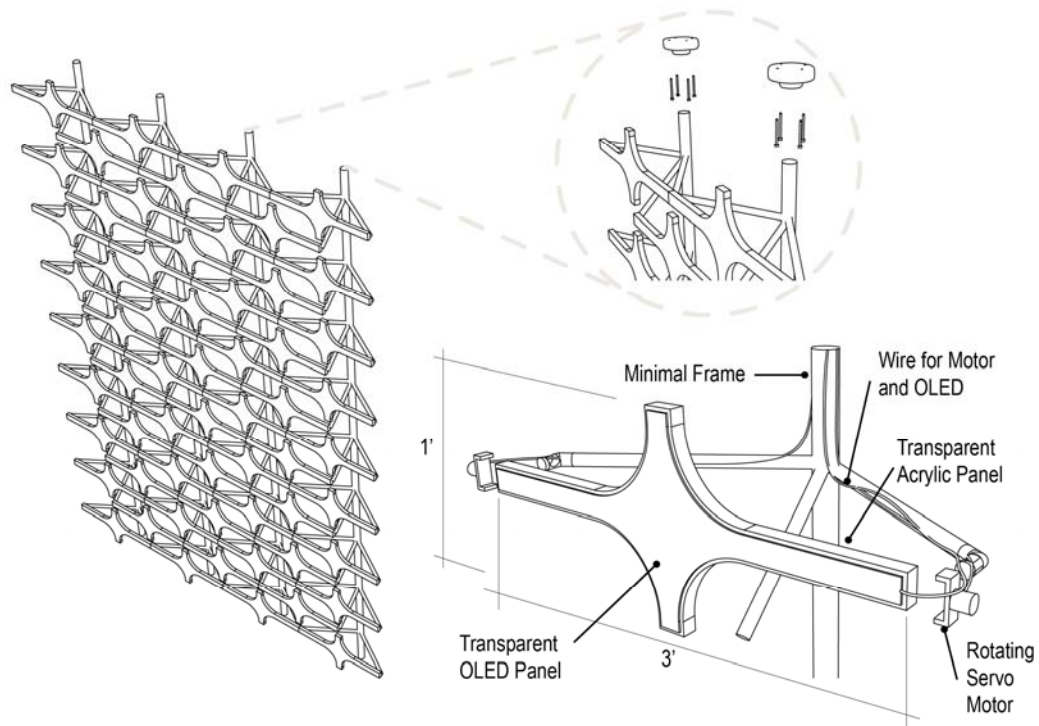


Figure 51: Diagram of skin element

within the skin. The shape of the skin harkens back to the stylized pattern of the mid-century modern *brise soleil*. The form consists of a series of diamond-shaped patterns that are elongated in the horizontal direction to instill the idea of movement along the ramp.

These series of panels can each individually rotate along the horizontal access, creating a reveal between the two spaces. This rotation is activated through the proximity and location of a person along the path of the ramp. As a pedestrian walks through the path, the skin would follow the person, rotating along the way to reveal the presence of the person to the gym members. An example of this rotation of panels can be seen in Figure 52. This kinetic movement also acts as a form of motivation through instilling curiosity within people to understand the installation.

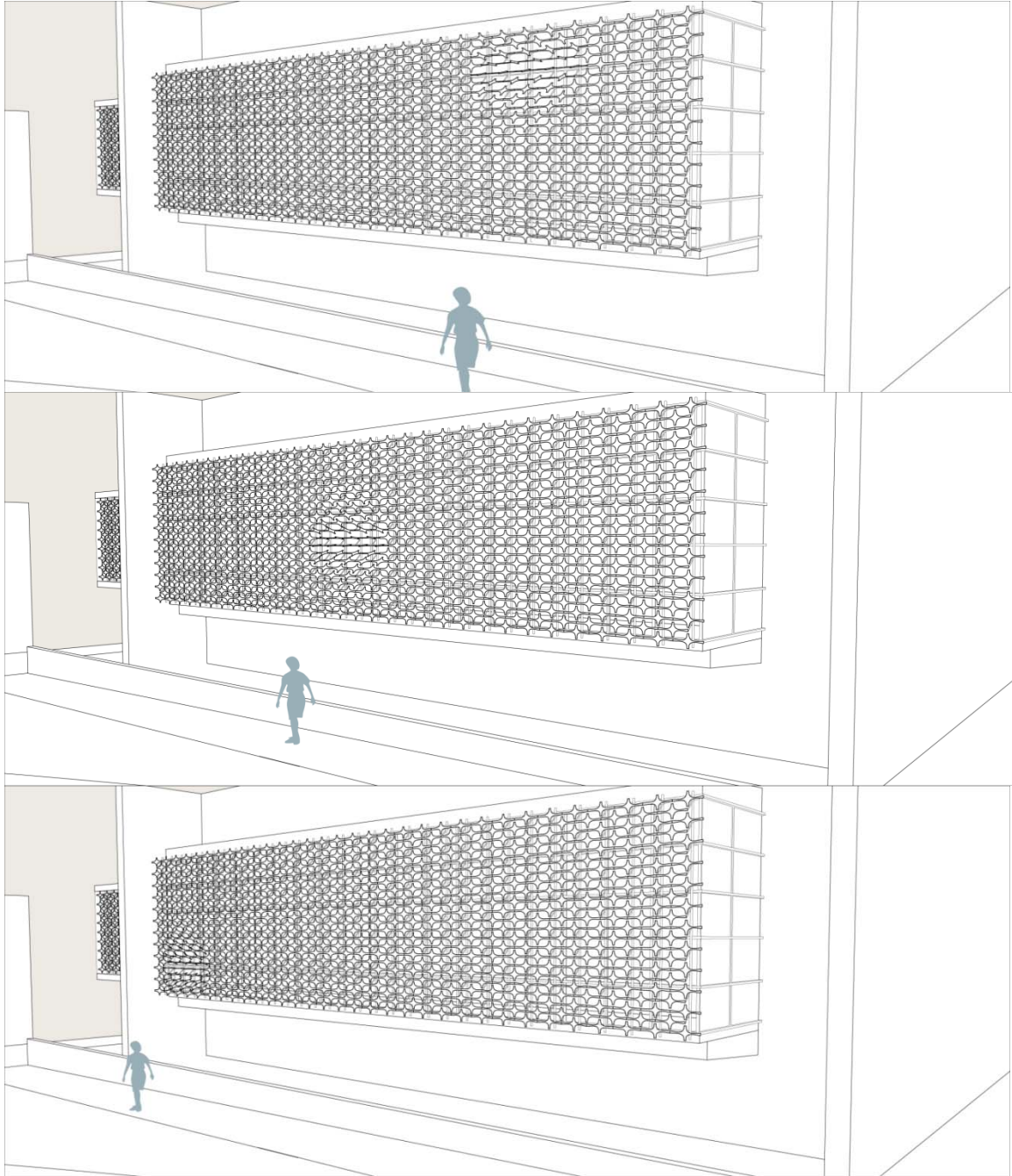


Figure 52: Series of images displaying how the skin rotates and tracks the person.

In order to maintain as much of the transparency of the façade, each panel is made of a transparent acrylic material that is slightly tinted. On the outward facing face of the panel is a transparent OLED panel. OLED stands for Organic Light Emitting Diode, which are thin films with of bioluminescent material coated onto it. When electricity is applied the film, it will illuminate. The advantages of this technology is that an OLED

can come in a transparent film and still be able to light up. The reason these panels are transparent is to minimize the visual impact of the skin upon the gym in consideration of view planes as well as natural lighting.

The reason each panel is able to individually light up is based on the motivational elements of the gym patron. Figure 53 gives a basic diagram of how the lights become more lively through gym activity. Sensors are put on the machines that are closest to the window and each of these sensors pick up the activity from the machine. The more activity, the more active the skin around the machine is going to be with light. This light acts as a motivator for the person working out, "gamifying" their work out as well as informing people outside of the gym about how active the inside is.

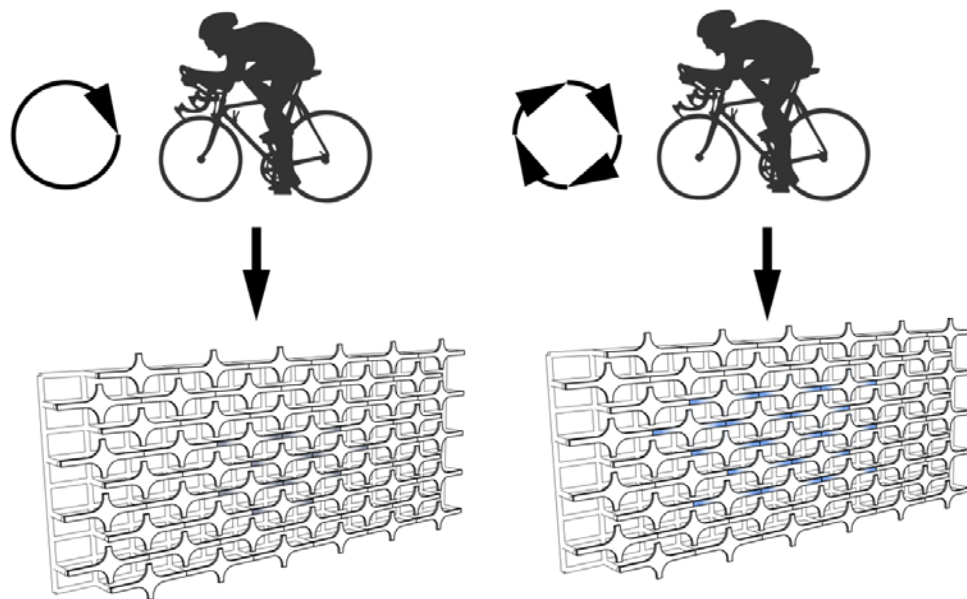


Figure 53: Diagram showing how the activity of the gym influences the intensity of the light

The second part of the intervention is the wall/canopy installation. The wall is a free-standing structure that extends over the pathway creating a canopy to protect the pedestrians from the random showers of Manoa Valley. The form of the wall is a three-dimensional representation of the skin. The two layers are offset to create a one

foot thick wall that is able to support itself. A breakdown of the design of the wall can be seen in Figure 54. A minimal steel prong footing design was implement to be able to stick the wall into the ground without bulky foundations and allowing for easy removal. One of the main characteristics of an interactive installations that it is ephemeral by nature, meaning that these installations have a lifespan. These lifespans can range from a few days to a couple of years and it is important to come up with ways of minimally impacting the existing environment. The wall consists of the curved wood panels, which are backed by frosted acrylic panels. The outer panels of the curved wood panels are backed with a set of OLED Panels. These panels shine up into the frosted acrylic panel, creating a nice diffused, ambient lighting on both sides of the wall. This light also tracks the pedestrians, in a similar fashion to the rotating skin, following the person along the entire path. As the wall continues down the ramp it begins to recede back into the grassy area in order to embrace the retreat space.

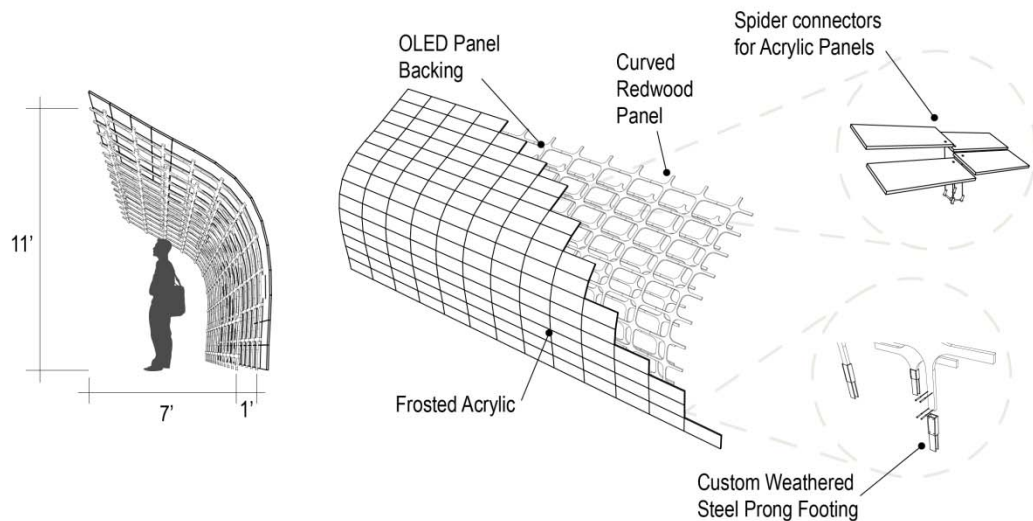


Figure 54: Breakdown of the components of the wall/canopy design.

At this retreat space, a series of LED screens are fitted into the pattern of the wall, which can be seen in Figure 55. Each of these screens display information from various sources such as weather information, UH sports updates, school newspaper headlines, as well as social media comments when tagged with UH related topics. Another amenity with the wall is that there are charging ports below the screens, which allows people to plug in their various devices and charge up. This power supply gives more incentive for people to stay within the space along with the multitude of information being displayed on the screens.

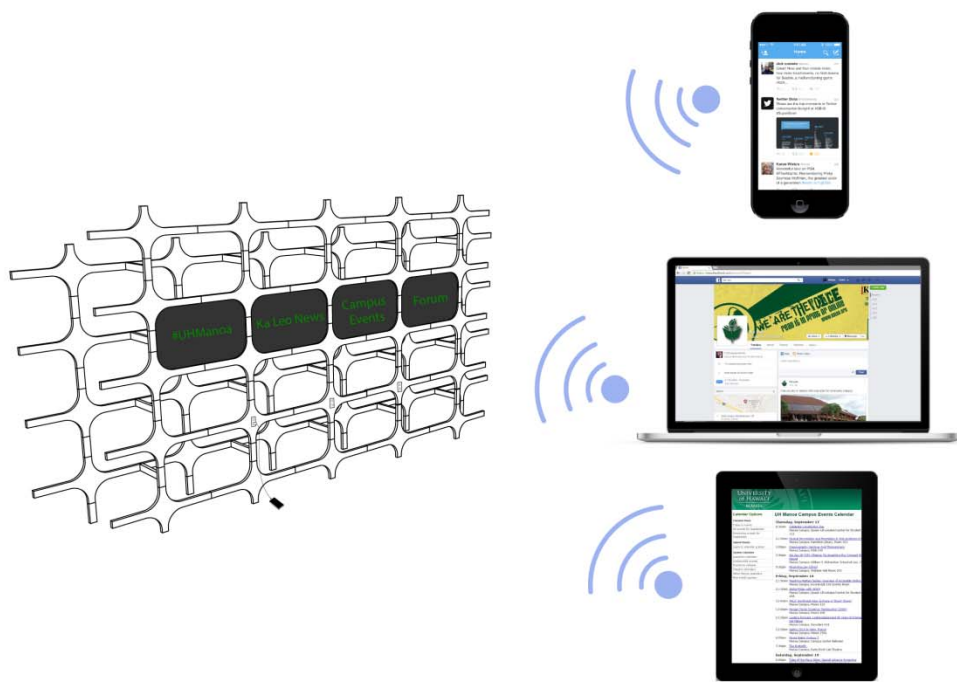


Figure 55: Display screens fitted into the pattern of the wall with charging ports below

An important criteria of the design was the relationship of the various spaces. A breakdown of these spaces can be seen in Figure 56 with the section drawings. The canopy of the wall is designed to flare up towards the façade so that it does not visually prevent participants from seeing the skin. As a result, each installation opens up to one another, which allows people within each space to be aware of one another. The section on the left shows the retreat space, which is separated from the transient space by a low tree. This creates a distinction between the two spaces, which allows the retreat space to be peaceful, and the transient space to be active.

Figure 57 also gives a glimpse of what the wall and the skin would look like when active

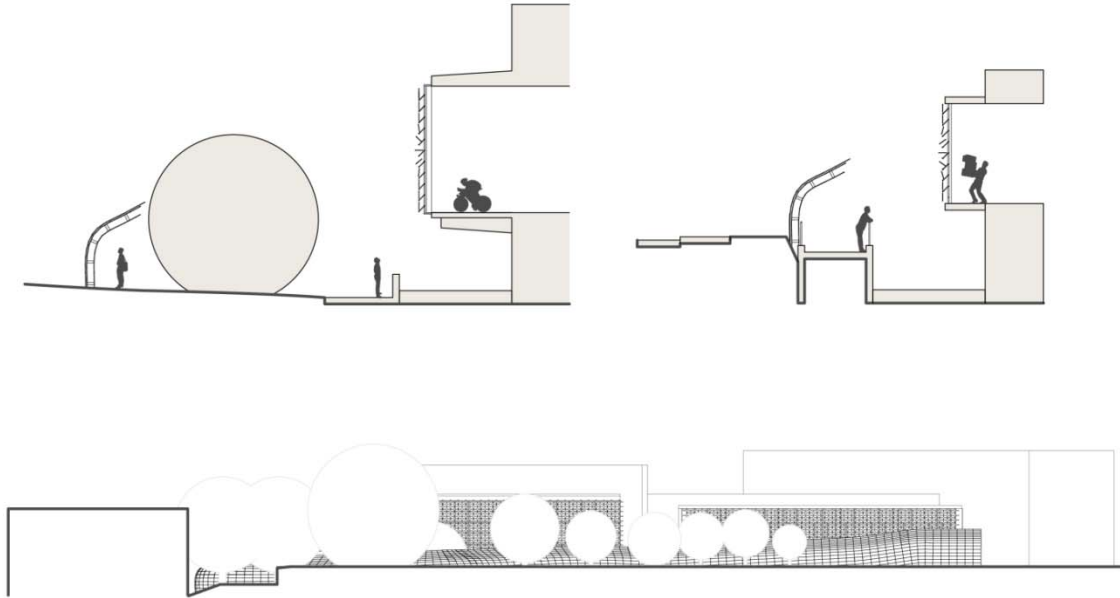


Figure 56: Top: Section showing the relationship between the various spaces. Bottom: South facing elevation

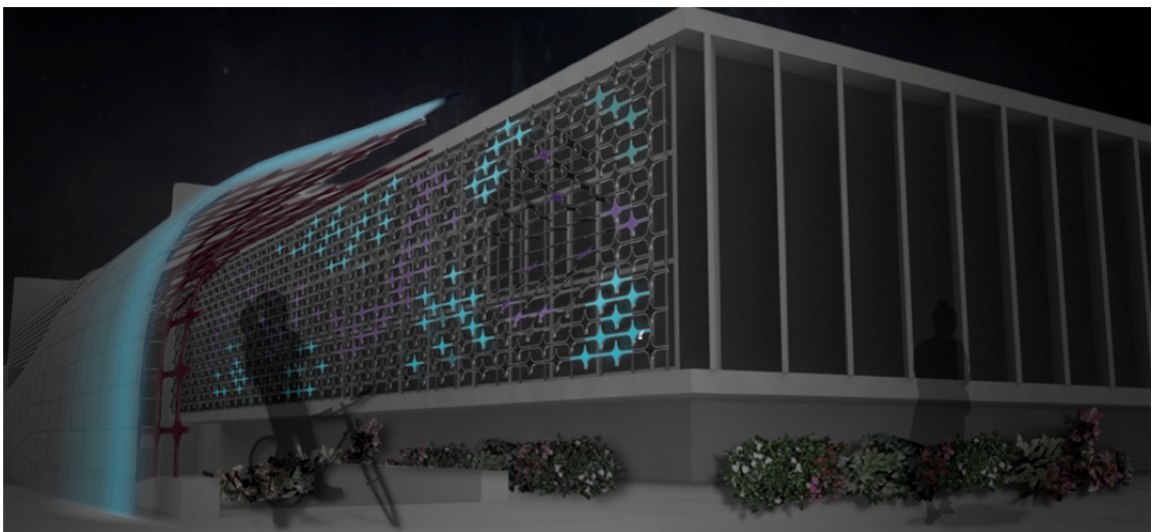


Figure 57: Rendered image of the skin and wall design.

## 7.7 Scenarios

The most definitive way to prove whether or not the installation works would be to actually build it or build a mock-up of it to see how people would react. Unfortunately, with the scale of the project, a full-scale mock-ups isn't feasible. The next best thing that can be done is to create a set of scenarios. These scenarios are intended to further illustrate how people would be able to interact with the installation.

### 7.7.1 Scenario 1: Retreat Space

Professor Tom has just finished eating lunch at campus center. He has a few minutes before his next class so he takes his time heading back to his office at Saunders Hall. On his way, he notices a wall with a low pulsing light (Figure 58).



Figure 58: Professor notices the lights

Intrigued, he walks up to the wall, as he gets closer he notices that the wall continues on down a ramp. Having time to kill, Professor Tom decides to investigate (Figure 59).

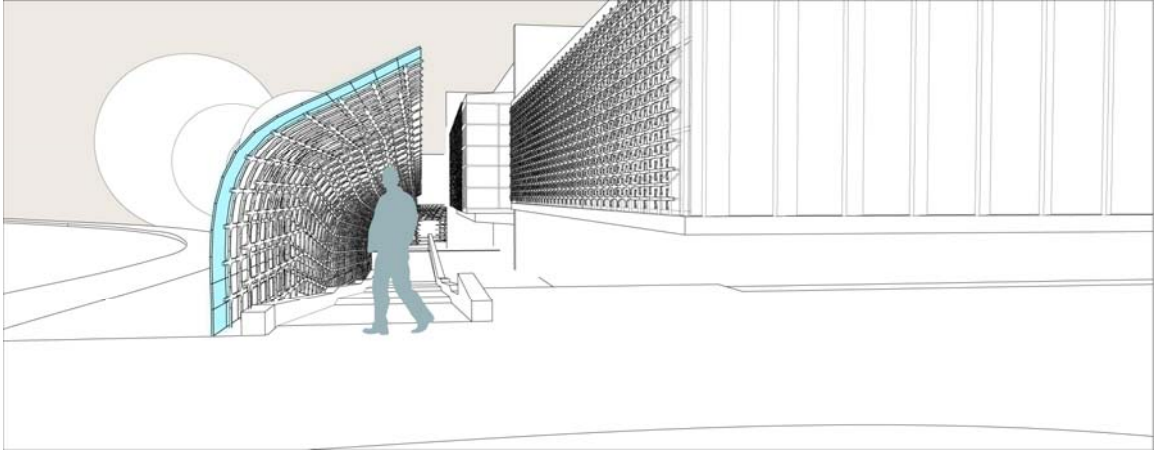


Figure 59: Wall reveals pathway

As he walks down the pathway, he notices the light follows him (Figure 60).

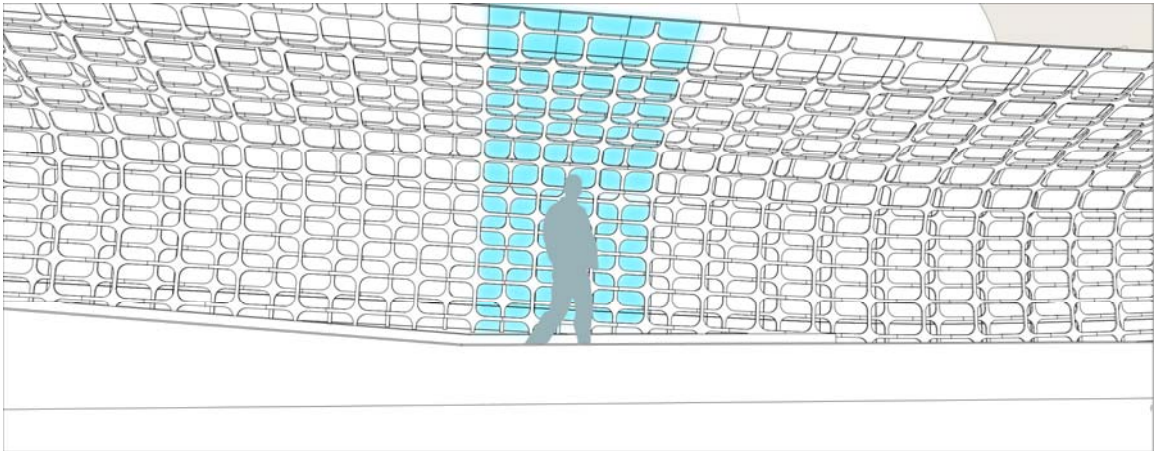


Figure 60: Light follows professor

Down the walkway he sees the wall veer off the path and into a lawn area, wrapping around a tree. At the bend in the wall he sees a series of screens and as he gets closer he notices each screen displays a series of messages (Figure 61).



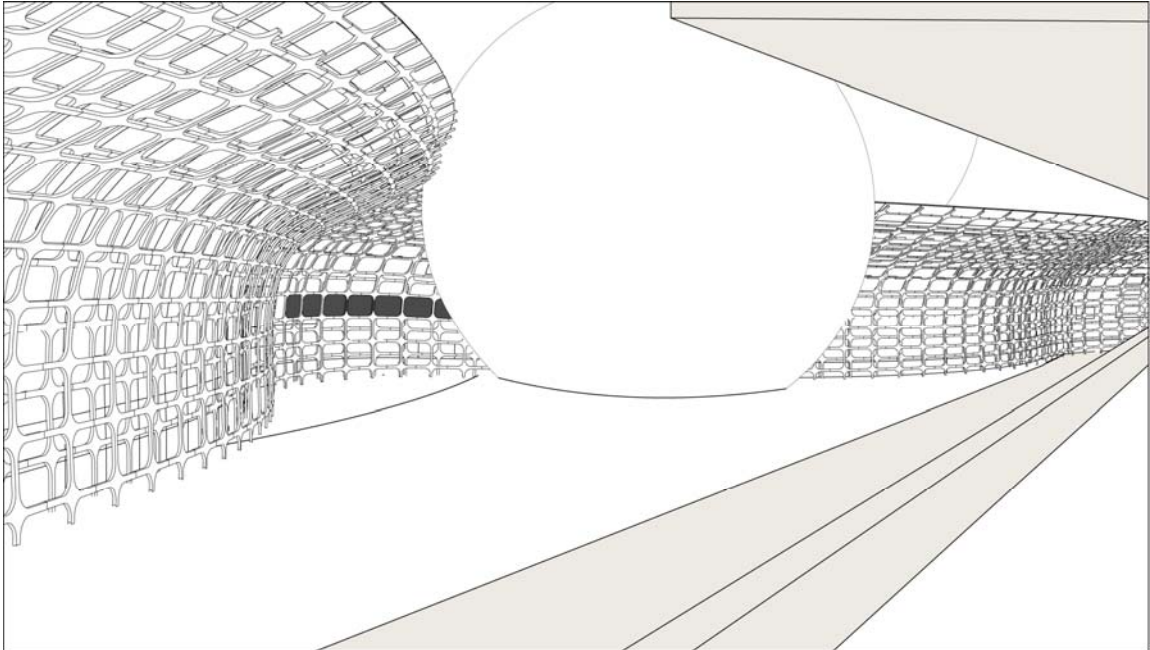


Figure 61: Reveal of retreat space

Each message relates to various things, one seems to show a headline, the other shows the next football game, and the other displays messages with a hashtag attached to it. Intrigued by one of the headlines, he notices that it is from the Ka Leo Newspaper. He takes out his iPad and begins to look up the article, as he searches his iPad battery begins to die (Figure 62).

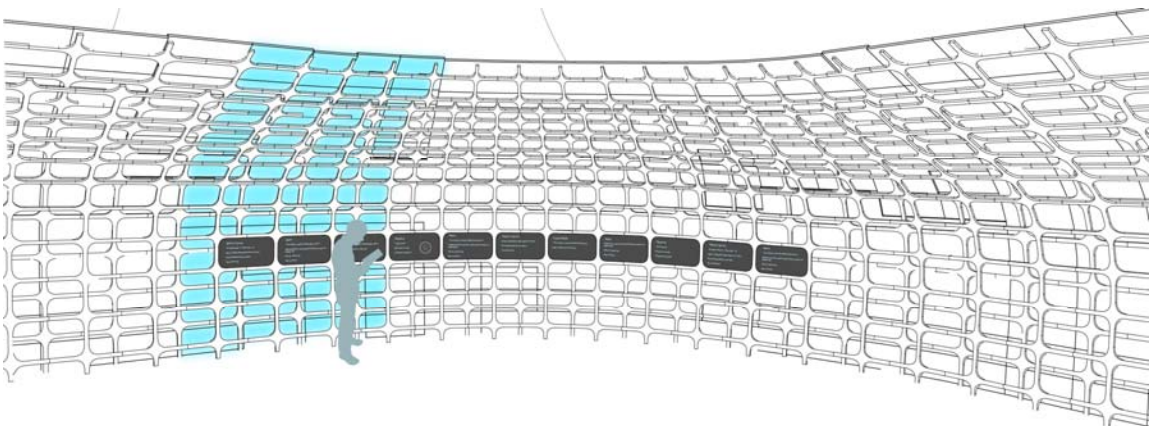


Figure 62: Retreat space

He looks down and notices that there are some electrical plugs available for him to charge his device. Minutes pass as he continues reading the news, suddenly he



## 7.7.2 Scenario 2: Alternate Route

Samantha is a student at the University of Hawaii, travelling in between classes. In order to get to her next class she must go through the Campus Center courtyard, one of the busiest thoroughfares on campus and a journey she never looks forward to. As she walks down campus road, she notices this new structure fronting the Warrior Recreation Center. As she gets closer, she notices a light glowing along the structure (Figure 64).

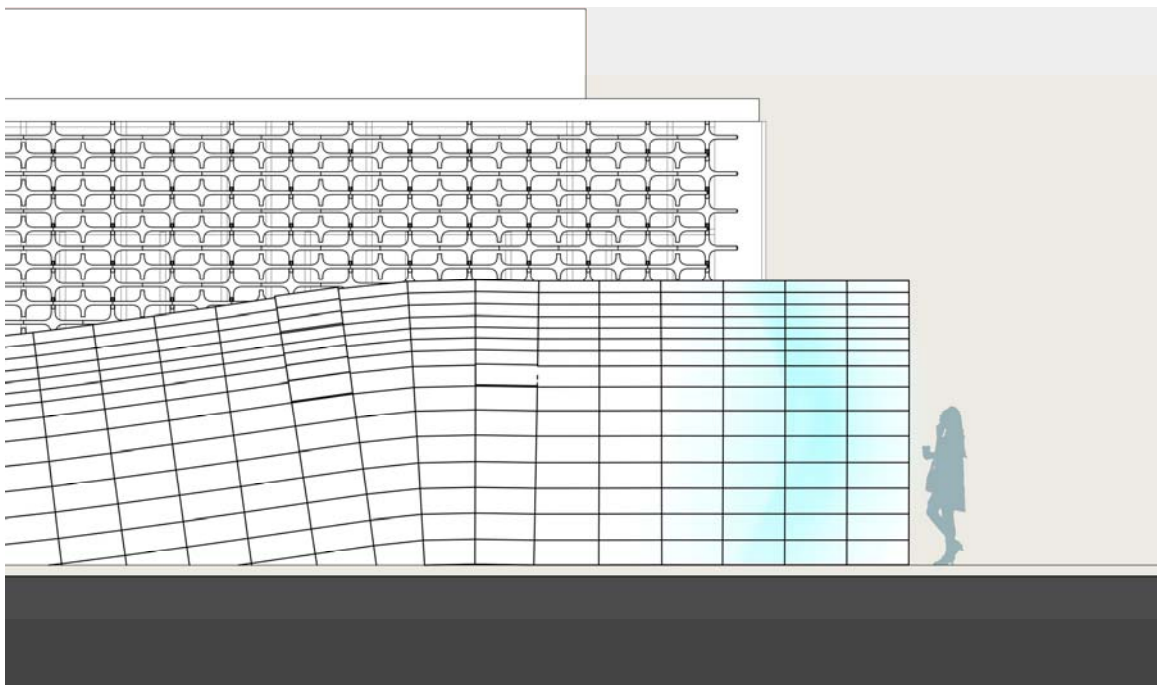


Figure 64: Samantha observes the light

Intrigued, she investigates the structure and notices that it follows a pathway she's never noticed before. Seeing how there were no pedestrians, Samantha decides to take this route. As she walks down the initial streak of light begins to follow her, and concurrently, objects within the window of the Rec. Center begin rotate, revealing the façade of the building (Figure 65).

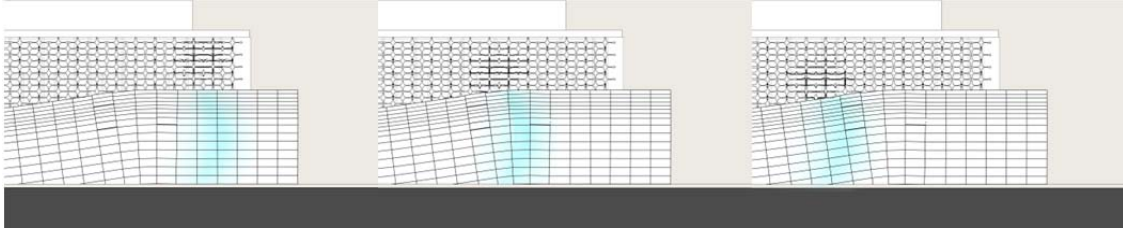


Figure 65: Skin and wall react to Samantha's presence.

Each of these actions continue with her down the pathway, seeming to encourage her to continue through and forget about the stress traveling to her class. As she exits the pathway and continues on her class she feels happy that she found this playful new pathway (Figure 66).

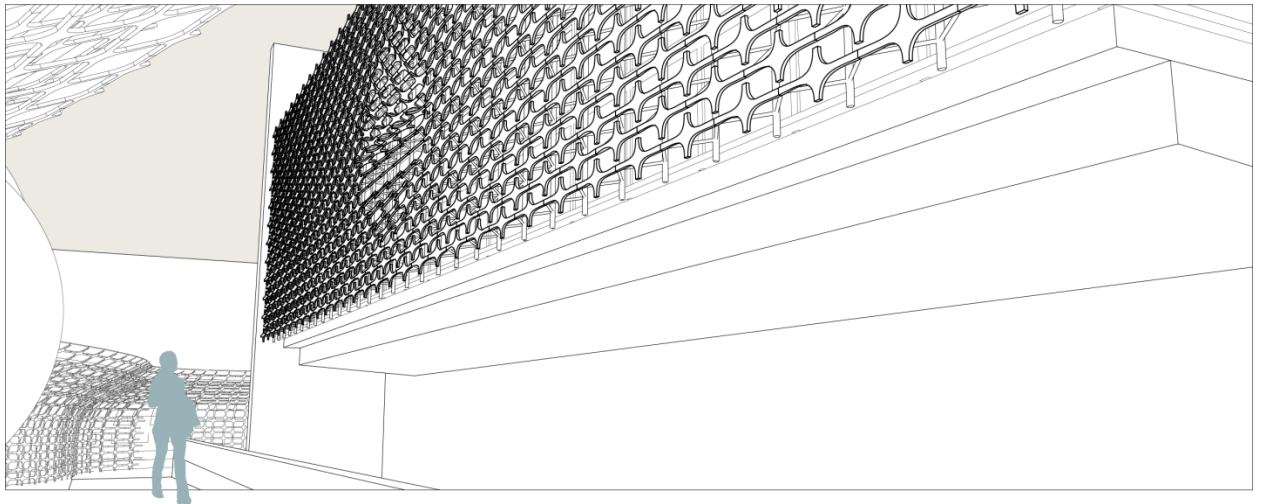


Figure 66: Samantha appreciates the installation.

Figure 67 shows the path that Samantha takes on her journey. Samantha's initial MOTIVATION to use the pathway was due to the pulsing light coming from the wall. Once along the pathway the symbiotic interaction between the PHYSICAL display of the light from the wall and the rotation of panels along the façade created a secondary encouragement for her to use the space. As she moved along the path the rotation of the panels and the light along the wall followed her all the way through and INTELLECTUALLY she understands that it is her presence, which is causing this phenomena. EMOTIONALLY she is thankful for the installation showing her this new path and feels a connection to the site through her immediate impact upon the installation.

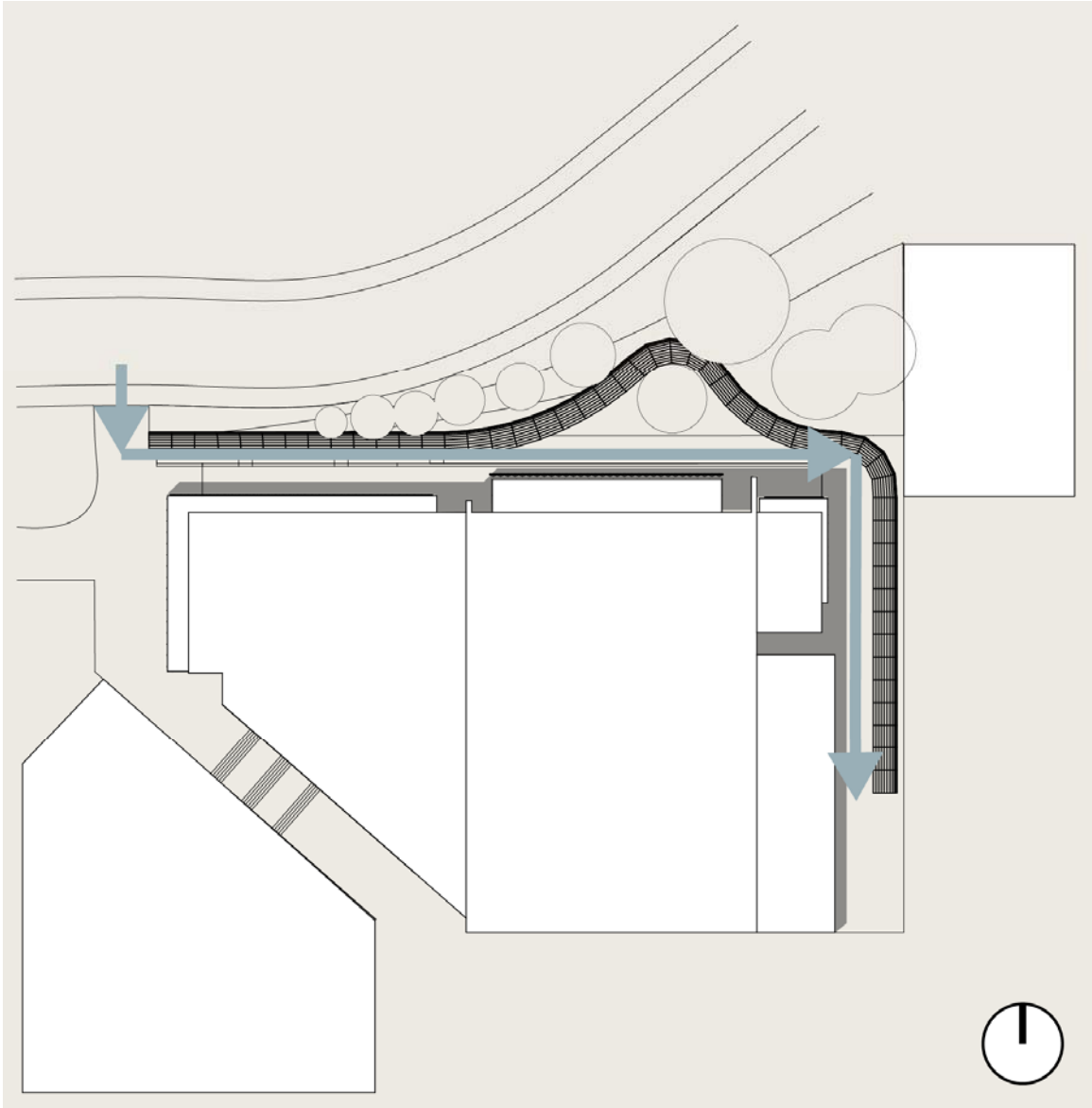


Figure 67: Samantha's path.

### 7.7.3 Scenario 3: Enlightening Workout

Jason just finished class and wants to exercise. Heading towards the gym, he notices objects in window of the gym. A random streak of light seems to be slowly meandering across the objects (Figure 68).

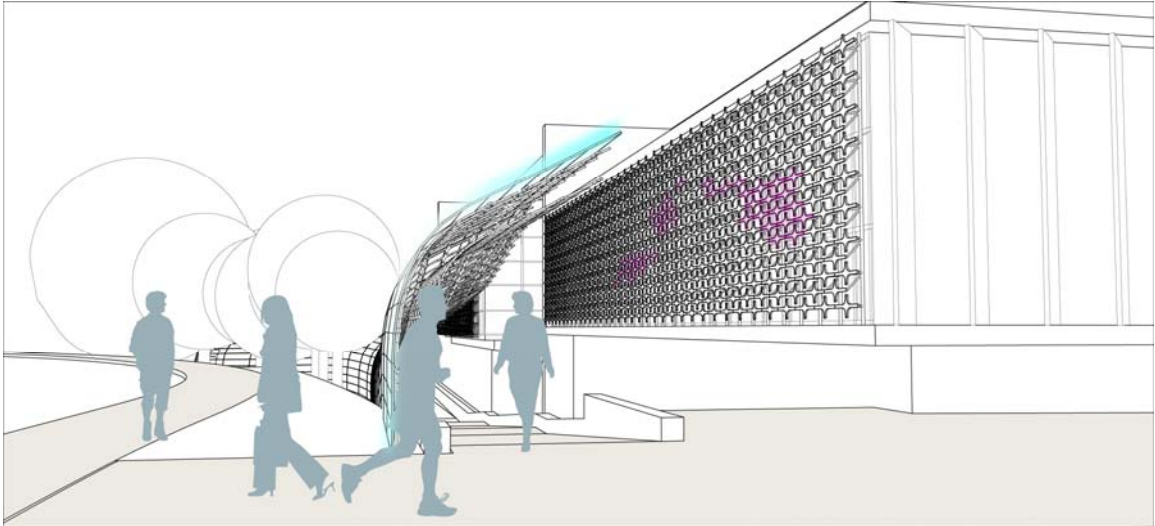


Figure 68: Jason notices lights

Thinking nothing of it, he continues on to the gym and notices the objects from the inside of the window. Still disinterested, Jason continues with his work out, not paying any attention to the objects (Figure 69).



Figure 69: View of the objects from the inside.

The next day, he wishes to go to the gym. As he passes by he notices the objects again, but this time the light seems to be more upbeat (Figure 70).

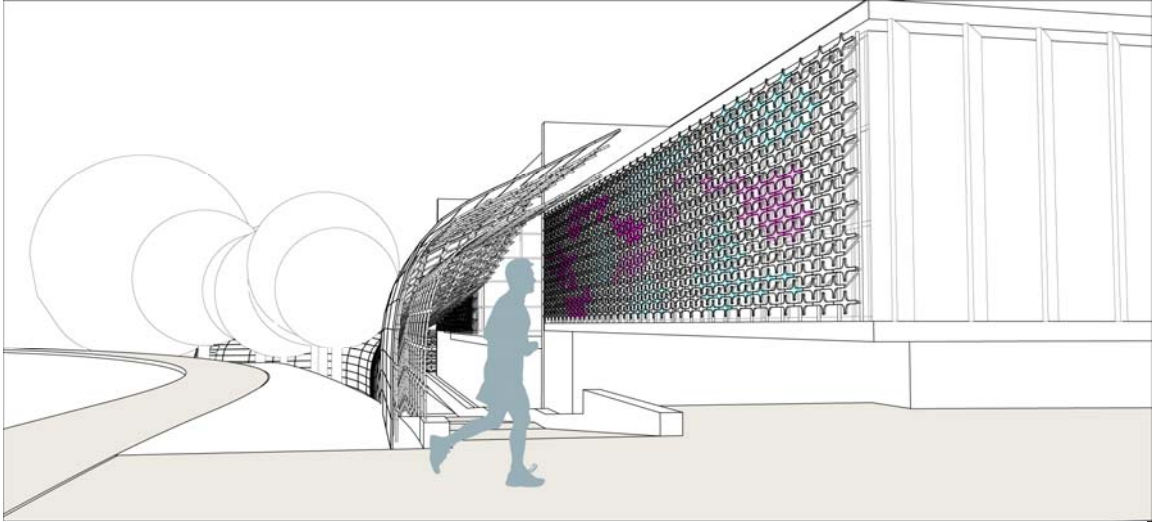


Figure 70: Jason notices the lights are more active.

Thinking nothing of it again, he continues on to the gym, but this time the gym is packed and full of people (Figure 71).



Figure 71: Gym is packed.

Putting two and two together he concludes that the light must correlate to how active the gym is. Wanting to confirm this, he walks through the gym to the window he saw these objects. From afar, he sees nothing, curious he gets closer to the window and faintly makes out the outline of these objects (Figure 72). A person walks down the

pathway and the object rotates towards him and as it does so he notices there are a series of transparent panels only visible by a thin white strip around the outside of the panel, or when they light up. Excited by his discovery, he immediately begins to work out, motivated by the lights and wanting to be able to influence the façade.



Figure 72: Closer look at the rotating panels

Figure 73 shows the path Jason takes on his way to the gym. In this scenario, Jason notices panels along the façade of the gym and sees that they light up. This gives him the MOTIVATION to investigate the façade while he is in the gym. As he gets close he notices that each panel PHYSICALLY lights up and rotates individually. On the second day, Jason makes an INTELLECTUAL connection that the frequency of the light relates to the activity of the gym as well as the rotation of the panels interacting with the pedestrians along the walkway. Lastly, he is connected EMOTIONALLY through being apart of the activity and directly influencing the façade.





# Chapter 8: Discussion and Future Development

Through the research in this paper was uncovered a 4 Step Design Process developed during the *ANIMATO* project by Sandra Vina. This design process became one of the key elements, for this project, in designing an interactive installation. By creating a design matrix, which correlates the interactive design guidelines with stakeholders of the site, a pattern of design criteria emerge, which informs the design. This project consists of two parts, the façade skin design and the wall-canopy design and both of these installations were derived from this design matrix.

Motivation – The wall installation creates a low pulsing light, which entices people to enter and investigate. As a person gets closer, the skin begins to rotate further intriguing participants. The skin is also able to light up, informing gym patrons of the activity of the gym.

Physical – Each panel within the skin rotate and light up, allowing a variety of ways in which the participant can distort and interact with the façade. The wall has a series of lights within it that lights up the acrylic panels, tracking the position of the person both inside and outside of the pathway.

Intellectual – These installations give out a variety of information, each targeting a different stakeholder. For the student and faculty members, there are a series of screens where information relating to the school is displayed thus keeping them connected. The pedestrians are alerted of the presence of this pathway and are offered an alternate route during times of high traffic. This is done by the pulsing of the light grabbing the attention of pedestrians. Lastly, the panels of the skin light up during

times of high gym activity and low gym activity, giving gym patrons the opportunity of knowing how busy the gym is as well as giving the gym users some motivation during their exercise.

Emotional – Participants are able to create a connection to the installations by being able to immediately impact it. People are able to change the form of the skin through their location along the pathway. This creates a sense of ownership, empowering people to want to return. Along the pathway is a retreat space, which is defined by the wall, that creates a safe haven, giving people an area to relax and retreat from the rest of the campus. Gym patrons create a playful bond with the skin because the lights that are displayed, challenges them to work harder.

Another successful aspect of this paper is the use of scenarios to further visualize the impact of this project. Scenarios are a tool that are used in a variety of different disciplines, but hardly done in architecture. These scenarios not only help to inform people of the function of the installation, but they also help to inform the design. By creating these scenarios, one can begin to understand the various ways in which the installation will be utilized and can adjust it when a problem arises.

While these scenarios are an effective tool for visualizing and understanding the function of the installation and how a person will interact with the piece, it is not a completely accurate representation of what would happen. These scenarios are completely fabricated and are an idealized representation of what interactions will occur with the installation. In order to get a more accurate representation, a full-scale mock-up model must be built. This model could then be placed within the same location or within a similar setting in order to further understand how the piece will be used. The last of the eight challenges of media facades, is the challenge of "Emerging and Unforeseen Uses of Places and Systems."<sup>64</sup> Humans have unique characters

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<sup>64</sup> Dalsgaard, Peter, and Kim Halskov. "Designing Urban Media Facades: Cases and Challenges." CHI '10. Atlanta: ACM, 2010. 2280-2285.

and it is difficult to say how everyone will interact with the installation. Having this mock-up would give a better understanding of unforeseen usages, which can be adjusted in further iterations. Through this prototyping phase, the design will change as well and become more refined. This project could benefit from further development within the physical realm.

Another way of further developing this project would be to take the design matrix and try to apply it to another site. The intent of this paper is to create a universal design process that can be taken and applied on any site. Applying it to different sites will reveal the true flexibility of the process as well as get a better understanding whether the process works. The range of sites should vary as well, for example in the next iteration a site off campus should be chosen where there will be a different set of stakeholders.

The final matter that can be further explored is the different interfaces in which people could interact: more specifically, ubiquitous devices such as smart phones, or tablets as a personal form of impact and interaction. A connection to ubiquitous technology was made, in this project, through the screen and encouragement of feedback through these devices, but it could be taken a step further by possibly influencing the form or the function of the entire installation. Technologies are becoming more integrated and have the possibility of creating new forms of interaction.

# Chapter 9: Conclusion

The purpose of this paper is to find a solution to the problem of dead spaces. Dead space is a common element found throughout the urban environment, which hinders the possibility of social interaction. These spaces are typically ingrained within existing infrastructures, making them difficult to be rebuilt. As a result, these spaces become a burden upon the urban landscape because they occupy real estate and can be costly and time consuming to get rid of.

This paper proposes the use of interactive interventions as a quick and dynamic solution to encourage the usage of dead spaces. Interactive interventions allow a more immersive experience through real time feedback between the installation and the person interacting encouraging participation. These interventions empower people to be creative, explore and change the way they interact with the built environment.

In order to test this theory a real world site was chosen, which is, by definition, considered to be dead space, to demonstrate the influence of using interactive installations. The design consisted of two parts: a skin design installed along the façade of an adjacent building, and wall/canopy design aimed to shelter the pedestrians. These two installations work in unison with one another, creating a playful connection with the participant, enticing them to interact with the space. This was done through rotation of each skin panel as well as the light emitted along the wall. The design of this installation was informed by the design matrix and was analyzed using a series of scenarios.

A successful aspect of this project was the use of scenarios in illustrating the way people interface with the design. By creating scenarios for each stakeholder, the designer is able to analyze the way each person interacts with the intervention, and can adjust the design if necessary. Scenarios are also used as a way of conveying the idea of the design to other people. By creating storyboards, audience members will have an easier time understanding how the installation works and how it relates to the site.

The most successful aspect about this project is the use of the design matrix in the process of designing interactive interventions. The design matrix consists of the four step interactive design guidelines, developed by Sandra Vina, and the consideration of stakeholders of the dead space. Alone, the four step interactive design guidelines provides a designer with the steps needed to create an engaging interactive design. By cross-referencing stakeholders with these interactive design guidelines, a connection is created between the design of the installation and the site.

Context is the most important factor involved when designing for a dead space. Every space is unique and has its own set of problems and solutions. In order to revitalize a dead space, social interaction needs to return within the space. As a result, local demographics of people familiar with the space (aka. stakeholders) need to be identified because they're most likely to understand and use the space. These stakeholders become the "clients" of the installation, informing the design process through their needs. By considering this factor the design will then create a relationship between the site, the participants, and the installation.

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