The Public-Object Nexus:
Activating Public Space Through Human-Centered Design

Aaron Basil Nelson

Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person except that which appears in the citations and acknowledgements. Nor does it contain material which to a substantial extent I have submitted for the qualification for any other degree of another university or other institution of higher learning.

Aaron Basil Nelson, February 2011

Acknowledgements

Abstract

The role of product design in activating public spaces is a relatively under researched area within the discipline of public space design. As a result, the potential for better addressing public user-needs through innovation using human-centered design has been largely unexplored. The primary objective of the Public-Object Nexus project was to investigate how the design of public urban furniture can be enhanced, to more effectively support an active and dynamic public lifestyle. The project sought to reposition the emphasis of public urban design from a macro to a micro level focus, so that user needs and desires might be more effectively addressed.

The project was underpinned by passive observations of urban public spaces, which were analyzed in the context of a number of design theories, resulting in the development of an open-affordances conceptual design framework. Evaluation and refinement of this conceptual framework was achieved through the design and development of three urban furniture proposals, personal reflection, and the subsequent use of potential users and experts for detailed evaluation.

A review and analysis of literature indicate that the needs and desires of public space users are often overshadowed by the implementation of a macro-level design approach, complicated by the divergent agendas of various stakeholders. The large-scale logistical and political complications involved with developing public spaces often appear to overshadow human-centered considerations. This approach to the design of urban furniture commonly emphasizes community legacy and aesthetics over functionality and user-centeredness. This insight is reinforced by the passive observation and analysis of user-object interactions in selected urban public spaces, revealing that a user's engagement often depends on the furniture's capacity to support a specific activity, such as eating, socializing, reading, and people watching. When furniture pieces do not serve sufficiently in this capacity, users are observed reinterpreting and/or adapting the furniture's originally intended function.

In response to key insights, an open-affordances conceptual design framework developed for the project, centers around three key facets of new human-factors, aiding activity, and flexibility. The open-affordances framework underpins a new approach to urban furniture design in which the consideration of dynamic user-needs, represented through these facets, is placed at the center of the design development process.

The three urban furniture design proposals developed in the research, *The Sugarhouse Lounge, The Hub* and *The Buttress*, have all explored the open-affordances framework from a variety of perspectives, and have identified a variety of issues and opportunities in public design. Although preliminary in nature, these design proposals demonstrate how public urban furniture can benefit from a framework of front-end human-centered research. This is evidenced by the favorable response to the design proposals by potential users and a variety of industry experts.

Table of Contents

List of Figures

1. Literature Review

This literature review explores an intersection of theory related to product design for public spaces. Although discourse within the disciplines of product and public design cover a wide range of knowledge and expertise, this review focuses on five subjects that frame the relationship between people, products, and public space design. These subjects are: understandings of public space, the influence of private lifestyle, public space design, the role of urban furniture, and a proposal for human-centered design. Although these subjects can be framed in a variety of contexts, this study focuses their application on the potential to enhance socially active public lifestyle.

1.1. Public Space

Each week, the balance of the world's urban population grows by 1 million people, and by the year 2025, almost two thirds of the world's population is projected to be living in cities (Cities: The urban equation, 2010). This global shift of an existence spent mostly in small settlements to a predominantly urban lifestyle has been referred to as an *urban stage of evolution* (Cities: The urban equation, 2010) and can be largely attributed to the economic and social magnetism of cities.

In investigating the draw of cities, Engwicht (1999) credits the diverse density of potential exchanges afforded by living in urban areas – exchange of goods, friendship, knowledge, culture, work, education, spiritual support, etc. Engwicht defines cities as an invention to maximize exchange opportunities and to minimize travel, and adds that humans choose to live

in cities because "exchanges are the real stuff of life" (p.19). Traditionally, these types of economic and social exchanges have occurred in the common areas of cities and towns – the public spaces – where both exchange and travel can be accommodated harmoniously. The streets, squares, and parks that constitute a city's public space give form to the ebb and flow of daily human exchange and serve as nexuses around which communities can gather (Carr, Francis, Rivlin, & Stone, 1992; Kent, 2000).

Broto and Krauel (2010) suggest that the high proportion of public space available in a city has been associated with an elevated quality of life for the city's inhabitants. This is partly due to the practical functions that public space and public amenities support such as visual and environmental enhancement, movement and transportation, recreation and relaxation, identity creation, etc. (Carr et al., 1992; Deasy, 1985). Yet an equally or perhaps more important function of public spaces is facilitating informal social contact and communication. Humans are social beings, and it is in public spaces where an engagement with diverse populations enables the full development of human character and the robust social structure of cities (Bounds, 2004). Correspondingly, Carr et al. (1992) characterize public space as the common ground where people carry out the functional and ritual activities that bind a community. When cities and neighborhoods have vibrant public spaces, residents have a strong sense of community; conversely, when they are lacking, they may feel less connected to each other (PPS, 2000).

According to Engwicht (1999), cities with vibrant public spaces and compelling public amenities are most apt to satisfy the inherent human

desire for reciprocal relationships, new ideas, and settings that stimulate all of the senses. Much of the intrinsic value of public space comes from its ability to offer an essential counterpoint to the routine of daily private life. In public, individuals can act freely and comfortably, come and go as they please, and no one has to play host (Oldenburg, 1991). Carr et al. (1992) declare that a healthy lifestyle encompasses a balance of private and public experiences in which people are freely permitted to engage in each domain, however, when public life is absent from this equation, people will become isolated and community connections will degrade (Carr et al., 1992). Without the communal engagement afforded by public spaces, it can be difficult to empathize with the concerns and convictions of fellow citizens and even harder to share aspirations of a shared vision for the city (Bounds, 2004).

1.2. The Fortification of Private

With an acknowledgement that public spaces replete with strong everyday relationships promote social cohesion, Sauri, Pares and Domente (2009) have observed a decline in the quality of public space provisions within many urban areas - a decline that could be partly responsible for the loss of social links and civic engagement in cities (Sauri et al., 2009). The diminishing significance of public spaces carries with it a departure from active participation in public affairs and a reduction in pride people feel for their community (Bounds, 2004). Some have ascribed the growing disproportion of public and private life to factors of modern individualism and consumer culture.

Arendt (as cited in Brandes, 2008) explains that in the ancient sentiment of the word, privacy (as in the trait of private life) was understood as being deprived of something – whereas someone who was not permitted to enter the public was not fully human. Today, the concept of 'private' is no longer linked to 'deprivation,' and Aredt claims this is due to the "enormous enrichment of the private sphere through modern individualism" (as cited in Brandes, 2008, p.192).

As cities attempt to cope with population growth and the changing needs of residents, the development of quality public space is being reduced in favor of an increasingly dominant private domain in the form of shopping centres, carparks, and access roads (Bounds, 2004). This pattern of growth has condemned modern society to spend the majority of life in private and/or semi-private space:

> Public space is increasingly degenerating into private territory. Shopping malls are private operations, which means that their owners can force out those they find disagreeable, while luxurious shopping districts have become virtual private grounds where one perambulates as if having received a private invitation…At the same time, the ability to relax in public is decreasing. Benches are being removed to prevent the homeless from loitering and barricades are being erected around building grounds, walls, and similar zones to prevent people from rededicating them as places to sit. In the future, sitting may only be allowed in those areas where one must consume. (Brandes, 2008, p.194)

Oldenburg (1991) refers to this predominance of private life as a "two-stop model" of daily routine (home and work) that is becoming fixed into the experience of many urban dwellers given the disappearance of public gathering centers, and adds that the pleasures of the city have been largely reduced to consumerism. In accordance, Bounds (2004) asserts "The contemporary city has moved from a city of production to a city of consumption."

CONSUMPTION

It terms of resources alone, urban areas consume more than their fair share. In 2006, about 50% of the world's population was inhabiting cities, yet cities accounted for two-thirds of total energy used, and 70% of carbon dioxide emissions (Cities: The urban equation, 2010). Inefficient land use patterns have led to the consumption of irreplaceable farmland, degradation of natural environments, and induced traffic that has been cited as a chief contributor to global warming – all factors that have positioned cities on a path for major ecological disaster (Engwhcht, 1999). According to Manzini and Jegou (2003), the current customs of urban daily living entail an unsustainable environmental weight. They concur that modern society's predominate custom of excessive resource consumption cannot be maintained in concert with a sustainable society (Manzini & Jegou, 2003). Farr (2008) attributes this situation to the commonly held modern presumption that human progress is best served through each individual's pursuit of self-interest. And in terms of creating environmentally and socially sustainable communities, this presumption has failed badly. According to these insights, the lifestyle of first-world inhabitants is on a destructive course. In a limited world with a rapidly growing population, a pattern of well-being qualified by the consumption of resources is inevitably unsustainable (Manzini & Jegou, 2003).

While an acknowledgement of environmental limits exists, and the necessity to share resources in order to achieve sustainability is apparent, current consumer behaviour suggests that personal material consumption is higher than ever (Dresner, 2002; Walker, 2008). The notion of sharing goods and resources has been superceded by a central importance given to individually available assets, and modern society has largely neglected the importance of common assets. As Manzini and Jegou (2003) propose, the most significant design question facing society today is how society can evolve to a point where expectations of well-being are separated from the consumption of resources. How can people be enabled to live well consuming much less while regenerating the quality of urban habitats?

1.3. The Role of Public Design

As the previous discussion illuminates, modern society places an unbalanced and unsustainable emphasis on the ownership of privatized goods (Manzini & Jegou, 2003). Therefore, exploring a counterpoint to the fervent private realm seems imperative through a re-envisioning of the role of publicly shared goods and spaces (Carr et al., 1992; Engwhcht, 1999; Oldenburg, 1991). Sauri et al. (2009) argue that public spaces constitute an important facet for urban sustainability as a component of urban life that enhances the well-being of residents through improved environmental quality, human comfort, and social activity. However, since the mid-1960s, public spaces have lost many of their functions in the social life of cities (Sauri, et al. 2009).

Part of culpability for this situation falls with the city agencies in charge of public space development who have not been responsive to the holistic needs of their neighborhoods, but rather more often intent on advancing the agendas of their disciplines and departments, such as traffic, building, etc., at the expense of creating well used, cherished urban spaces (Kent, 2000).

FORM VS. FUNCTION

Much literature in the discipline of public space development indicates an overabundance of public space design that emphasizes aesthetics over function. "Today, many public spaces seem to be intentionally designed to be looked at but not touched. They are neat, clean and empty – as if to say, "no people, no problem!" (PPS, 2000, p.20). The driving force behind public space design tends to exaggerate beauty and form, often ignoring the user activity that a space could or should support. Reflecting on his extensive studies of urban pubic space in the United States, Whyte (1980) asserts, "an enormous expenditure of design expertise, and of travertine and steel, went into some really bum plazas around the county" (p.15).

In most cases, it is not until a space has been built that much consideration is given to how people will actually use it; resulting in a significant level of retrofitting for failed public spaces because the user-function was never seriously considered at the outset (PPS, 2000). A shortsighted approach to the design of public spaces creates difficulty in providing for basic human needs such as comfort, relaxation, and discovery. The functionality that these spaces typically offer is often too passive, rigid, and unchallenging – most likely the result of designers and their clients confusing their desire to create a strong visual statement with good design (Carr et al., 1992). In light of this scenario, the emphatically endorsed alternative within public design discourse is informing the design of public space and amenities through a focus on the behaviors, desires, and needs of people who actually use the space, an act that will ultimately make the spaces more attractive and visually appealing - because people will actually be there (Carr et al., 1992; PPS, 2000):

> Our central assertion is that public space values must grow out of an understanding of why people go to spaces, how they actually use them, and what they mean to their users over time… [in short, their] needs, rights, and meanings. Although these are not the only important qualities, we believe they often are not addressed when public spaces are developed. (Carr et al., 1992, p.20)

SOCIAL CRITICAL MASS AND ACTIVATION

In an examination of public space from the perspective of user-needs and user-behaviors, The Project for Public Spaces (PPS, 2000) discovered that when users were asked to describe the qualities they wished to see in public spaces, intangible aspects were often identified with words like safe, fun, charming, and welcoming - traits that are difficult to measure and/or design for (PPS, 2000). Throughout their extensive research into the conditions of successful public spaces, PPS (2000) has identified accessibility, activities, comfort, and sociability as the four key qualities of successful public spaces. In addition, they offer specific characteristics that are often present within successful spaces: a high proportion of people in groups, higher than average proportions of women, different ages, varied activities, and the public display of affection (PPS, 2000). Whyte (1980) is famously quoted in

his seminal study of public spaces, The Social Life of Small Urban Spaces, "What attracts people most, it would appear, is other people" (p.19). Whyte (1980) maintained that the sociability of public spaces is what ultimately attracts users, not the design:

> [People] do not seek to get away from it all. If they did, they would go to the lonely empty places where there are few people. But they do not. They go to the lively places where there are many people. And they go there by choice – not to escape the city, but to partake of it. (p.100)

This assertion relates to the idea of a social 'critical mass,' in which a certain threshold of human-presence and activity is exhibited, therefore making a space appear valuable and interesting to other potential users. This effect implies a spatial activation - inspiring people to participate in the social functioning of a public space, and thus contributing its perceived vitality. Ultimately, it is the social interaction within a space that gives it a positive sense of *place and comfort* (Engwicht, 1999). However, the physical elements (i.e. design) of a space play a crucial role in either contributing to social activity or inadvertently discouraging it (Sauri et al., 2009; Whyte, 1980).

A GAP IN SUPPORTING ACTIVE PUBLIC SPACE

With the assumption that human activity and social interaction should be defining features of a successful public space, the question of how to design for these features rises to the surface. Social activity is characterized by impulses and movement, and design meant to support social activity should be informed by these factors. Dell (2008) explains that action does not necessarily arise from form, but that form arises from action, and

it is unfortunate that the architects and urban planners responsible for developing public space still believe that action will appear as soon as a form is built (Dell, 2008). Whyte (1980) makes the point that a typical plaza user will remain quite unaware of their architectural surroundings and is more apt to be paying attention to the activity happening at eye level. However, a gap exists in the provision of tangible public space design elements that effectively appeal to the human-scaled activity and affordances that are actually meaningful to users (Dell, 2008; Whyte, 1980).

1.4. Enter Urban Furniture

The design that constitutes public space clearly has an impact on appealing to the needs of public space users, however, it is possible that design at the micro scale (often not explored in public space discourse) might be the scale in which users, in the course of daily life, are most apt to relate and respond to. Of all the urban landscape elements that comprise a space, urban furniture has the closest contact and potential for interaction with humans (Siu & Wan, 2009). Siu and Wan (2009) claim that urban street furniture presents a significant influence on the urban environment and urban life because it is the component of design that most closely interacts with people – people who are inherently interested in satisfying their own varied needs, wants, and preferences (Siu and Wan, 2009).

The genre of urban furniture, also referred to as 'street furniture' and 'urban amenities' describes the sets of human-scaled objects and pieces, usually industrially produced, that reside in public spaces (Siu & Wan, 2009; PPS, 2000). This genre includes, but is not limited to, benches, bollards,

post boxes, telephones, streetlamps, traffic signs, bicycle facilities, waste receptacles, etc. These accessories that adorn the communal urban fabric of most metropolitan areas play an essential role in the safety and comfort levels of the public and can be a determining factor in attracting consistent human presence (Broto and Krauel, 2010).

Within the effort to improve the comfort, activity, and sociability of public spaces - the key qualities that Project for Public Spaces (2000) links to success - the provision of amenities in the form of urban furniture is a primary recommendation (PPS, 2000). This recommendation adds that the carefully considered location of amenities is important in creating community focal points, accommodating activity, and encouraging social interaction (PPS, 2000). However, with the exception that seating should be comfortable and movable, a more detailed discussion regarding the specific design aspects of human-scaled urban furniture is absent from recommendations.

In consideration that the needs and desires of public space users should drive design development, and that these needs might be best accommodated by the human-scaled aspects of urban amenities, the literature-based discourse regarding detailed urban furniture design is fairly deficient. However, a few authorities on the subject exist and are outlined in the following sections.

AUTHORITIES IN URBAN FURNITURE DESIGN

On the design of public urban furniture, Siu (2005) suggests that in order to fit the needs and preferences of users, designers of urban furniture must consider psychological, cultural, social, and ideological factors of their users, in addition to prerequisite physiological factors. Siu calls this principle for design "userfitness" – a principle that stems from the "historical, social, behavioral, and cultural backgrounds" of users as a basis for design (Siu, 2005, p.545). "By reviewing the concept of the spatial and temporal dimensions of culture, we can come to the understanding that a physical object or system has inseparable relations within the culture of an individual or group of users" (Siu, 2005).

BOLSTERING IDENTITY

A subsequent study by Siu (Siu & Wan, 2009) proposes the principle of Unity and Identity as a fundamental driver of urban furniture design. The study advocates the importance of designing urban furniture that reflects surroundings and represents local characteristics in an effort to maintain regionalism. It claims that, to ensure a high-quality of urban life, urban furniture should be presented with an identity relevant to the characteristics of its location (Siu & Wan, 2009). Although, In practice, Siu and Wan realize this effect with specific designs that seem exclusively informed by the ornate details of adjacent architecture and the stylistic heritage of Chinese tradition.

In Designing Public, a compendium of public design theory out of Köln University, Bieling (2008) also offers an argument advocating location-specific urban furniture, asserting that individualized designs are integral in any city's effort to develop a distinct urban identity. Bieling explains that individualized urban furniture that meets aesthetic demands can be realized while proving economically advantageous for state authorities and the private sector. Broto and Kraeul (2010) concur that urban furniture can serve an important purpose through offering landmarks for a city, citing London's iconic red telephone boxes as an example. However, the degree to

which urban furniture can address everyday problems is what will ultimately prove its validity (Broto and Kraeul, 2010).

RESPONDING TO BEHAVIOR

Bolstering the local identity and character of cities through urban furniture may be important, yet, designing for the behavioral transformation and improved public social experience that public space theorists advocate may require an alternatively innovative approach. As Carr et al. (1992) suggest, "When designs are not grounded in social understanding, they may fall back on the relative certainties of geometry, in preference to the apparent vagaries of use and meaning" (p.18). Designing for activity and social interaction can be difficult because the proclivities of human activity often evolve more quickly than form (Dell, 2008). In essence, form is constantly created in an attempt to 'catch up' to activity. A more effective approach might be to design or compose "impulses that spark movement" – which will then lead to form (Dell 2008, p.188).

In a study conducted by Daniel Bayer (2008) and his team from Köln University entitled 'Behavior in Public Space,' Bayer found that the behavior of public space users is usually dependant on how each individual perceives the semantics of a space, i.e. what the space affords the user to do and reflect on. These perceived semantics, or affordances, result in "making different interpretations and actions possible" – interpretations and actions that are often different from what was meant by the designer and design (Bayer, 2008). This formed a major finding from the study - indicating that a public space's design is not generally understood or used as it was originally intended (Bayer, 2008). Bayer offers a classic example in which a park

bench is meant for sitting, yet is often used for other purposes as well, and conversely, people will sit in other spots ignoring the provision of the bench. He claims that while the reasons behind unintended uses in public can only be speculated, "particular action is based on particular needs" (p.162). The study concluded with the assertion that, through public observations of user-behavior, needs can be deduced and then incorporated back into the design process.

However, in the traditional practice of public space design, primarily managed by landscape architects and urban designers, user-needs are not the driving design determinant. As opposed to product designers who are expected to employ an understanding of human-factors issues at the center of the design process (Jordan, 2000), traditional public space designers and developers seem to place a disproportional priority in the aesthetic and esoteric realms of design. A more socially supportive design process would be based on a broad understanding of demographics, delivery of programs, and services for basic human needs, which requires constant research, and qualitative and quantitative measurements of results (Pilloton, 2009).

AN ALTERNATIVE APPROACH

Within the imperative to promote user-behavior, desire, and need as the central focus of an improved public space design process, urban design research consultants, such as Copenhagen's Gehl Architects, have made significant progress towards quantifying the connection between human behavior and the quality of public spaces. Studies such as Gehl's professional assessment of urban public life in Wellington, New Zealand (Gehl, 2005),

make measures to recommend prioritizing pedestrian flow and connectivity and improve human-centric design elements. Quantitative methods of assessment including pedestrian counts, surveys of existing urban furniture, and evaluation of stationary user-activities all help bolster a strong and rigorous case for Gehl's human-centric recommendations for public space improvement. The majority of Gehl's recommendations, while not directly constituting design solutions and/or end-products, recommend that human-centered solutions are appropriate and should be considered by the municipality to improve urban public spaces.

The question that arises seems to revolve around how the physical act of design can *respond* to an informed understanding of public behavior. Fabricant (2009) claims that "designers are now in the behavior business" - a statement reinforcing the connection between design practice and behavioral outcomes. Yet, the current practice of designing and developing public environments design does not seem to demonstrate a human-centered behavioral consideration at the forefront of design impetus. In terms of public space design, Deasy (1985) declares that the principal reason for building anything should be to help people accomplish their purposes as effectively as possible. With this declaration, a deeper understanding of human purposes and/or needs becomes a prerequisite to design.

1.5. Human-Centered Design

In his study of public space design, Whyte (1980) observed that while designed public amenities and artifacts such as urban furniture do enhance the quality of urban living, they often do so more by inadvertence than by intentional design. Building ledges used as seats and rubbish bins used as tables were among the few examples that Whyte cited as an indication of unmet needs and insufficient urban furniture design. In response to this, Whyte suggested that a gap exists in the understanding and subsequently responsive design of urban furniture for actual user-needs.

HUMAN NEEDS AT THE CENTER

Developing an understanding and responsiveness to user-needs requires a shift in the practice of public space design. From the perspective of product design, Pilloton (2009) states that "we must begin with the human need and ask questions like, 'What is the problem and how can I best approach it?' and 'What are the most basic needs that design can serve?'" (p.35). These inquires present a central tenet of the new model for "need-based, human-centered design" (Pilloton, 2009, p.35).

The practice of Human-Centered Design (HCD) can be succinctly characterized by Brown's (2009) suggestion that "we need to return human beings to the center of the story. We need to learn to put people first" (p.39). Human-centered design, an emerging approach to informing design with the needs of users, is gaining esteem among design theorists and practitioners. Greenhouse (2011) presents a definition of human-centered design:

> Human-centered design is based on the physical and psychological needs of the human user, enabling the user to function at the highest level possible. It includes products and aspects of the physical environment that meet the needs and abilities of the user... Human-centered design is not a design style, but is a process for designing and

developing buildings, products, and communities that is grounded in information about the people who will be using them. (Greenhouse, 2011, p.1)

In addition to this definition, IDEO (2010), a leading international design firm and chief authority in human-centered design practice, appends:

The reason this process is called "human-centered" is because it starts with the people we are designing for. The HCD process begins by examining the needs, dreams, and behaviors of the people we want to affect with our solutions. We seek to listen to and understand what they want. We call this the 'Desirability' lens. We view the world through this lens throughout the design process. (IDEO, 2010, p.5)

To those in design practice, HCD is viewed broadly as a process and a set of techniques used to create new solutions for problems or design opportunities throughout the world. Solutions often involve products, services, environments, organizations, and modes of interaction (IDEO, 2010).

COMPREHENSIVE PROCESS

A human-centered approach to design entails developing a level of empathy for expected users, at the front-end of a project. Designing meaningful and innovative solutions that serve constituents begins with understanding their needs, hopes, and aspirations for the future (IDEO, 2010). As HCD generally refers to a process as opposed to a particular style, 'self-expression' is not considered an end in itself (Greenhouse, 2011; Buchanan, 2004):

[In human-centered design], self-expression is only a means toward the deeper goal of serving other people. We serve other people by strengthening their individual dignity and supporting collective social values, all within the pluralism of human experience. (Buchanan, 2004, p.35)

REPOSITIONING DESIGN EMPHASIS

Human-centered design positions the designer in what Erlhoff (2008) explains as an advantageous role in which designers can use their own "analytic, reflective, and creative strengths…including designers early on in the decision making process instead of consigning them to last-minute cosmetics" (Erlhoff, Heidkamp & Utikal, 2008). In the design of built environments, these early stages of the decision making process are often referred to as the 'programming' phase in which research aids decision-making around identifying the scope of necessary work, the functional needs, and the problems to be solved. An emphasis on 'programming,' and an influence on the programmatic functions of urban public spaces, could get designers in closer alignment with the front-end imperative of human-centered design, offering a greater opportunity to uphold users-needs as a basis for informing more effective and meaningful design outcomes.

THE HUMAN-SCALE CONNECTION TO PUBLIC SPACE

Human needs are not static; rather, they are dynamic and demanding in the way that individuals will continue to reach for better, more enjoyable, and more meaningful situations (Utterback, Vedin & Alvarez, 2006). Therefore, a methodological design process for exploring and responding to these

dynamic needs, specifically in the public, is pertinent in creating successful public-object relationships and strengthening social ties.

Utterback (2006) explains that physical design (and particularly product design) plays a significant role in satisfying human-needs, citing the "hammer, cup, and the wheel" as everyday examples of designed products that help people meet needs and reach goals. The micro-scale of design that products represent appeals to peoples needs along two dimensions according to Verganti (2009); one is the utilitarian function, and the second is the psychological and cultural meaning (individual emotion and social symbolism). In the spectrum of built design, the human-scale of product design is particularly positioned to offer a significantly positive impact in addressing dynamic human needs.

In order for the design for public spaces to appeal to people's functional, emotional, and social comforts, Pilloton (2009) suggests "we must reorient public priorities to value design solutions that physically, emotionally, and economically heal us in more substantive ways without perpetuating consumer habits" (p.26). A human-centered approach to micro-level design elements presents a new opportunity for improving the human experience of public space, while addressing Manzini and Jegou's (2003) call for developing systems which optimize the employment of products and at the same time encourage new forms of socialization. Enhancing socialization at both interpersonal and civic scales forms the foundation of how a human-centered design approach can contribute to healthy urban communities and improved scenarios of active public life.

2. Design Research Objectives

This design research project reexamines and challenges the design of products for public spaces. As the literature review has indicated, the design of urban furniture has been relatively under-examined within critical public design discourse, and consequently, a gap exists in the provision of products that effectively address dynamic user-needs in public spaces. This project aims to identify and develop design opportunities that more effectively address human-centered considerations and social activity.

Overview

With a professional background in urban design, and more recent post-graduate training in design strategy, the researcher comes to this project with a persistent interest in the role that design can play in elevating urban quality of life. Specifically, this research embraces a personal and professional interest in enhancing the physical, tangible, human-scale elements of public space, and it is the strong belief of the researcher that there is considerable potential for design at this 'micro' scale to positively impact human experiences and social interactions on a 'macro' level.

Through an approach that focuses on the affordances of design (i.e. what a design enables people to do), the potential for activating public spaces through design intervention was examined. A central aim of this practice-based research project was to explore user-object relationships, and respond through improved design of human-centered urban furniture for public spaces. It was the intention of this research to reinforce the social needs of urban communities through design both in terms of the personal interrelations that comprise a community, and the democratic implications associated with expanding the notion of what should constitute public space.

There are two key aspects to this research:

ACTION RESEARCH

As part of a Master of Philosophy academic endeavor, this project was undertaken as a vehicle for learning and engaging in the practice of product design. The process incorporated exposure to and experimentation with divergent and convergent design research, critical design thinking, and the tools of product design development. A focus on the subject of public design and urban furniture has allowed the researcher to leverage prior professional experience in urban design and landscape architecture, and orientate this towards research objectives that explore and test a product-related human-centered design methodology. In addition to bolstering the creative and academic goals of the researcher, it is believed that applying a human-centered design approach within the field of macro urban environments can offer a significant contribution to the discipline of urban design.

PROPOSING INNOVATION

At the core of this project was an objective to propose more effective and socially conducive public product design. The processes employed front-end research and development that would lead to hypothetical design concepts intended to challenge existing notions of urban

furniture. While acknowledging the practical implications of design development, the principal goal for design was to regard an improved human-experience as the central measure of success. The intended outcome was to instigate a discourse around how product design might more effectively contribute to public social innovation.

The key research objectives were to:

1. Establish a triangulation of public space design and product design theory in order to frame research objectives and test a human-centered approach to public urban furniture design,

2. Identify insights for design through research methods of passive public observation,

3. Develop a framework for designing innovative urban furniture that more effectively supports active public lifestyle,

4. Evaluate the validity and efficacy of the framework and associated design proposals through an expert evaluation.

3. Methodology

Described in this chapter is the methodological framework and specific design-research methods used to explore how the design of urban furniture might more effectively support active public life. The first sections cover the qualitative methodology and human-centered approach that underpinned this study, followed by a detailed description of the methodological design research stages and correlating methods used to design, analyze, and evaluate new opportunities in urban furniture design. Additionally, design research methods that were used for the practice-based portion of this study are also described in full within each respective practical design project chapter.

3.1. Design Research

The Carnegie Mellon School of Design presents a definition of design as the process of taking something from its existing state and moving it to a preferred state (ST&P, 2010). Explicit in this definition is the action of change, yet not addressed is the purpose or rational for enacting such a change. By the same token, Jones (1992) explains that the act of design can be difficult because designers, using only current information, are obliged to predict and produce the future – a future that will not come about unless their predictions are correct. Within the uncertainty of designing, the value of design research begins to surface as a process that can validate action and reinforce predicted outcomes. Design research offers an array of creative tools to help braid theory and practice, and more effectively inform innovation from earlier stages of concept development (Lunenfeld, 2003; Laurel, 2003). Brown (2009) adds that a distinction of the design paradigm

is to generate ideas and concepts that have not existed before - a distinction best carried out through the creative process of design.

The term 'methodology' refers to the way in which problems are addressed and answers sought. In the social sciences, the term refers to how research is conducted (Taylor & Bogdan, 1997). For this study, a mixed-methods research methodology (Creswell, 1998) was adopted to guide inquiry and practice-based design research to explore how the design of public urban furniture might be improved to better enable active public life. The methodology follows in an emerging practice-based tradition of human-centered design research in which the foundation for design insight is based on first-hand account, observation, and interpretation of human behavior. This study employed human-centered design techniques that were underpinned by qualitative methodology and action research. The rigor and strength of this form of qualitative research is derived through deep understanding, not broad coverage, and a consistent process of reflective action that imparts accountability to the free flow of the mind (IDEO, 2010). According to Schön (1983), this process of "Reflection-in-Action," occurring principally within the creative stage, is "central to the art through which practitioners sometimes cope with troublesome 'divergent' situations of practice" (p. 62). On the advantages of action research, Schön explains that through reflection, the practitioner is enabled to criticize the tacit modes of operation that become implicit through specialized practice in order to develop new practical approaches to creative problem solving.

The practice-based, human-centered approach allows the researcher to jump intuitively between a variety of research and design methods. Often, the

process of design research is an act of imagination just as much as design is itself (Johnson, 2003). Jones (1992) agrees that design research necessitates an imaginative, not conventional, course of thinking, but adds that it is the rigour with which the methods are carried out that "permits a higher aim, a wider view." The rigour in this research is established through reflection and analysis.

For design research, and particularly that concentrated with socio-behavioral patterns, a mixed methods approach with qualitative emphasis is useful for facilitating a broader perspective of the subject matter, and ultimately provides a greater opportunity to identify and understand the diversity of views, values and activities of communities (Mackenzie and Snipe 2006). Mixed-methods were used within a methodological framework of human-centered design to understand, and then design for an improved human experience with public products.

3.2. Human-Centered Design Research

The emerging paradigm of human-centered design research can be characterized by a set of methods and practices aimed at getting insight into what would serve or delight people, leading to clues that can inform design (Laurel, 2003). Laurel (2003) adds that "good" human-centered design research holds the potential to proliferate new values that shape popular culture. As a methodology, Human-Centered Design (HCD) embraces a set of procedures and protocols aimed at ultimately informing design opportunities. Many of these methods are commonly used in a range of research disciplines, yet are methodologically adaptable to the practice-based

approach characteristic of creative practitioners (Gray & Malins, 2004). The global design consultancy IDEO has perhaps most notably popularized and publicized HCD - most recently with its publicly available Human-Centered Design Toolkit (IDEO, 2010). This Toolkit highlights the 'human-centered' aspect by methodically focusing on the people who are being designed for. "The HCD process begins by examining the needs, dreams, and behaviors of the people we want to affect with our solutions" (IDEO, 2010, p.5). This approach illustrates the foundation of the HCD methodology.

In order to guide the Public-Object Nexus through a reliable design research process, a methodological process was developed through an adaptation of Swann's (2002) Action Research design process model and IDEO's (2010) Human-Centered Design Toolkit. Both sources suggest a three-staged process that is seemingly structured yet critically iterative and often non-linear.

Swann (2002) explains that the design process can only be effective if iterations are encouraged in which the central problem is re-analyzed and solutions are re-synthesized. In the first step - the research stage - insights and opportunities are established and used as a basis for the next step - the creative stage. The creative stage is primarily comprised of generative methods such as ideation, modeling, and synthesis, and followed by a final communication and evaluation stage (Please refer to *Figure 3.1*).

Others have referred to these successive stages of design research as "divergence, transformation, and convergence," where design conceptualization progresses in the direction of expansion-to-contraction

(Jones, 1992; Rhea, 2003). This model might suggest that the process follows in a linear trajectory. However, this is often not the case. The inherent critical attributes of reflection and intuition often lead the researcher to cycle backwards a few steps or to jump ahead – as the need arises (Swann 2002). Of design research, Jones (1992) proposes that the process must facilitate freely jumping around in sequence from one aspect of the problem, or its solution, to another, as intuitively as possible – advocating the free flow of the mind (Jones 1992).

"In qualitative studies, researchers follow a flexible research design. We begin our studies with only vaguely formulated research questions. We do not know what to look for, or what specific questions to ask until we have spent some time in a setting. As we learn about a setting and how participants view their experiences, we can make decisions regarding additional data to collect on the basis of what we have already learned" (Taylor & Bogdan, 1997, p.8).

Human-Centered Design

Communication Stage
Ideas are developed into a concrete plan of action

Research Stage
Insights are gathered from a variety of sources

Creative Stage
Insights are translated into ideas
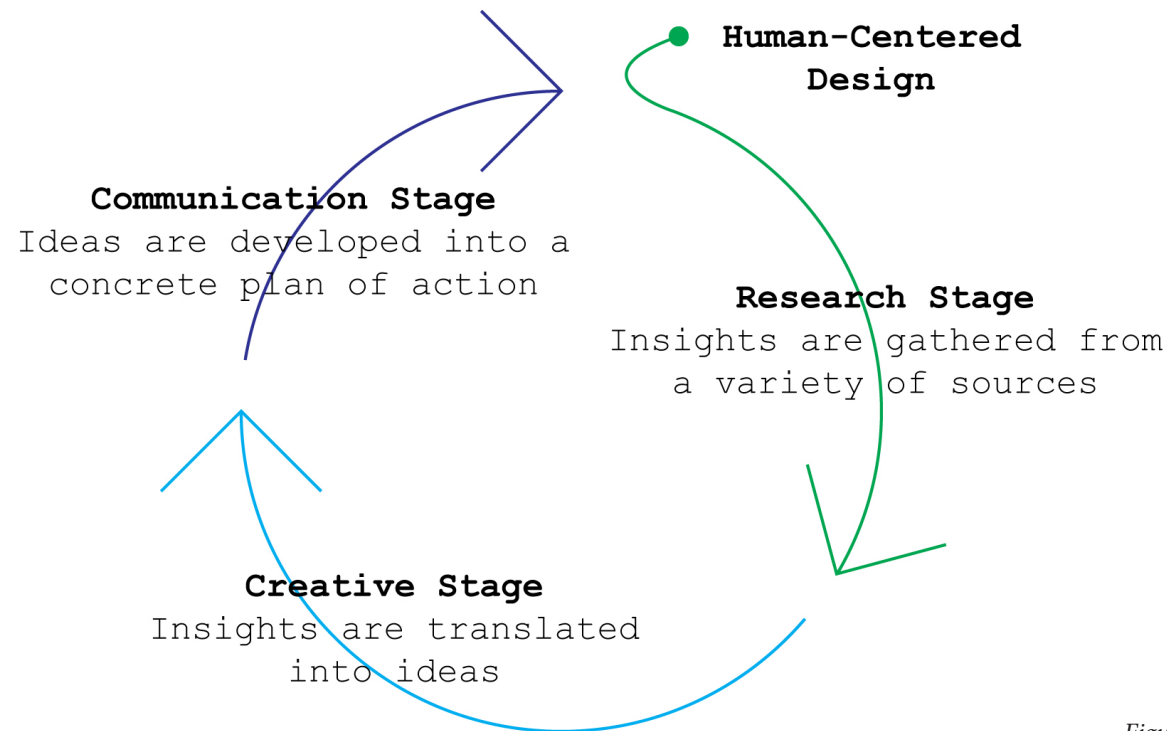
Figure 3.1 The Stages of Human-Centered Design Research

3.3. Stages of HCD Research

THE RESEARCH STAGE

This initial stage of the human-centered design (HCD) methodology, entitled the research stage, is largely characterized by the objective to develop qualitative understandings and insights that can then inform design. The qualitative aspect of this stage compels the researcher to derive insights through recognizing patterns in data rather than assessing preconceived models and hypotheses (Taylor & Bogdan, 1997). Emphasis is placed on the prolific production of descriptive data drawn from direct human accounts and observable behavior. From the resulting depth of data, interpretations of the meanings people attach to the things in their lives can start to take shape (Taylor & Bogdan, 1997). The qualitative methods that comprise the research stage create a foundation for practical design by unveiling the social, political, economic, and cultural opportunities and constraints of people within their own settings (Taylor & Bogdan, 1997; IDEO, 2010). Furthermore, a holistic view of settings and people is essential to this type of qualitative research (Taylor & Bogdan, 1997).

The Research Stage is a divergent stage in which appropriate methods are often exploratory and discovery-based, usually requiring leg-work rather than armchair speculation (Jones, 2002). In terms of research for design, research should be emphasize discovery, not track existing conditions and assumptions (Rhea, 2003). On divergence, Jones (1992) claims that the aim is to increase uncertainty, achievable by expanding the boundary of a design problem so as to have a large enough search space in which to seek a fruitful solution.

The HCD methodology specifically adapted for this study correlates closely to IDEO's (2010) HCD Toolkit, and its three-staged design process. For the research stage, the 'Toolkit' advocates thorough consideration of the design problem at hand and a necessity to recognize existing knowledge - in addition to robust qualitative socio-behavioral research. Below is an enumeration of the research stage methods that were employed for this study:

* Question Development
* Contextual Review
* Passive Observation

THE CREATIVE STAGE

"This is the stage of pattern-making, fun, high-level creativity, flashes of inspiration, changes of set, inspired guesswork; everything that makes designing a delight" (Jones, 1992, p.66). Within the HCD Methodology, the creative stage is where acts of reflection, analysis, and synthesis unite qualitative research and action research. According to Gray & Malins (2004), this transformative unity between research and practice / thought and action / is one of the central tenants of successful reflective practice.

Action researchers see knowledge as what they do. It is never complete and it is constantly shifting and developing as new and different understandings emerge… Learning is therefore rooted firmly in experience: the experiences are reflected upon in the light of the researcher's values and then future actions can be decided upon. (Paul, 2010, p.37)

Sometimes the creative stage is referred to as the design stage in which 'research' ends and 'design' begins. Yet within a qualitative/reflective methodology such as HCD, 'design' is not distinguished from 'research.' Swann (2002) concurs with the assertion that "the design process is a research process." The rigor and relevance of this action research stage is supported through a protocol of transparency – making the process evident with visible self-evaluation and accountability, and through acknowledging the particular tacit knowledge of the practitioner (Gray & Malins, 2004; Swann, 2002).

The creative stage is perhaps the most abstract part of the HCD process, when identifiable human needs are transformed into high-level insights and system frameworks (IDEO, 2010). Synthesis and interpretation play key roles in this stage along with the recognition of critical variables, constraints, and opportunities (IDEO, 2010; Jones, 1992). Following synthesis, the mode of action within this stage becomes generative, tangible, and judicious. The methods listed below were used as the primary means of exploration during the creative stages for this study.

- Brainstorming
- Analysis & Synthesis
- Ideation
- Feedback

THE COMMUNICATION STAGE

In this convergent stage, the design process aims to reduce secondary uncertainties until one solution can be chosen from an array of alternative designs (Jones, 2002). The stage consists of convergent thinking and processes that begin to evaluate creative concepts through a filter of practical criteria such as viability and feasibility. Top ideas that emerge from the creative stage are prioritized and measured against issues like marketability, customer needs, cost-efficiency, etc., and moved closer to implementation (Rhea, 2003). IDEO (2010) suggests that implementation is an iterative process requiring many prototypes and pilot projects before the final design is complete, however, this stage also requires fully acknowledging the scope and capability of the implementing organization in order to achieve a successful outcome.

The communication stage methods utilized for this study are listed below:

- Delivery
- Evaluation

For this particular study, an emphasis was placed on the theoretical, conceptual, and generative stages of the design process. The scope and resources were limited in terms of full evaluation and implementation. Therefore, an emphasis within the communication stage was placed on visual representation, selection of alternatives, hypothetical implementation, informal evaluation, and identifying opportunities for further research.

3.4. Central Project Map

The Public-Object Nexus was conducted using a full human-centered design process, including all three stages of design research as described above. For a successful transformation to occur during the creative stage, it was important to split the overarching problem into "sub-problems" replete with sub-goals and sub-outcomes (Jones, 1992). This study was primarily practice-based, using three individual projects, each addressing a unique set of sub-questions, to inform the overall research inquiry.
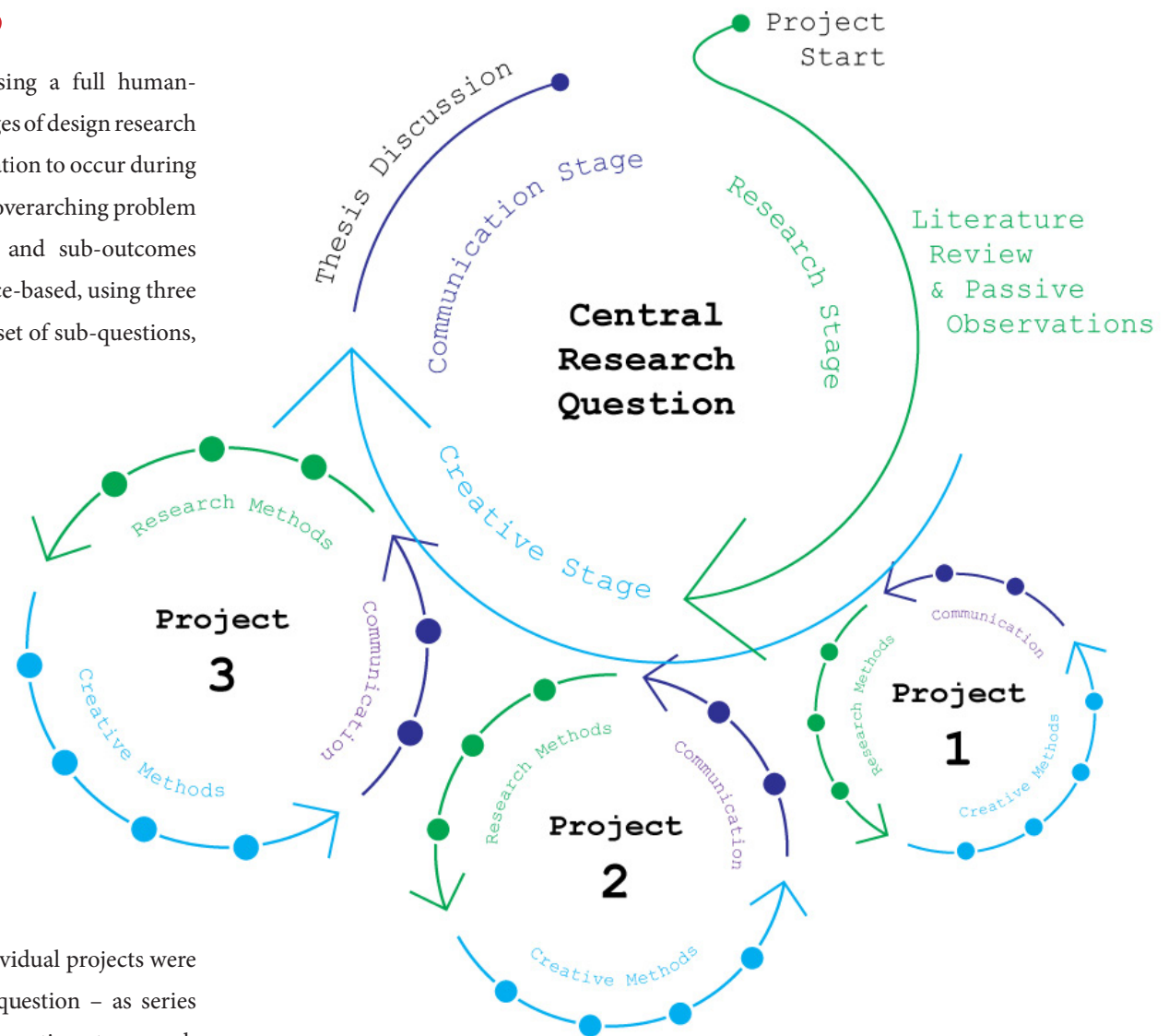
Figure 3.2 This diagram displays how the individual projects were executed in relation to the central research question – as series of projects situated within the overarching creative stage, each overlapping and informing subsequent projects.

3.5. Design Research Methods

The remainder of this chapter is devoted to describing Human-Centered Design methods and their application to the Public-Object Nexus. *Figure 3.3* below outlines specific methods that guided the individual projects within this study.
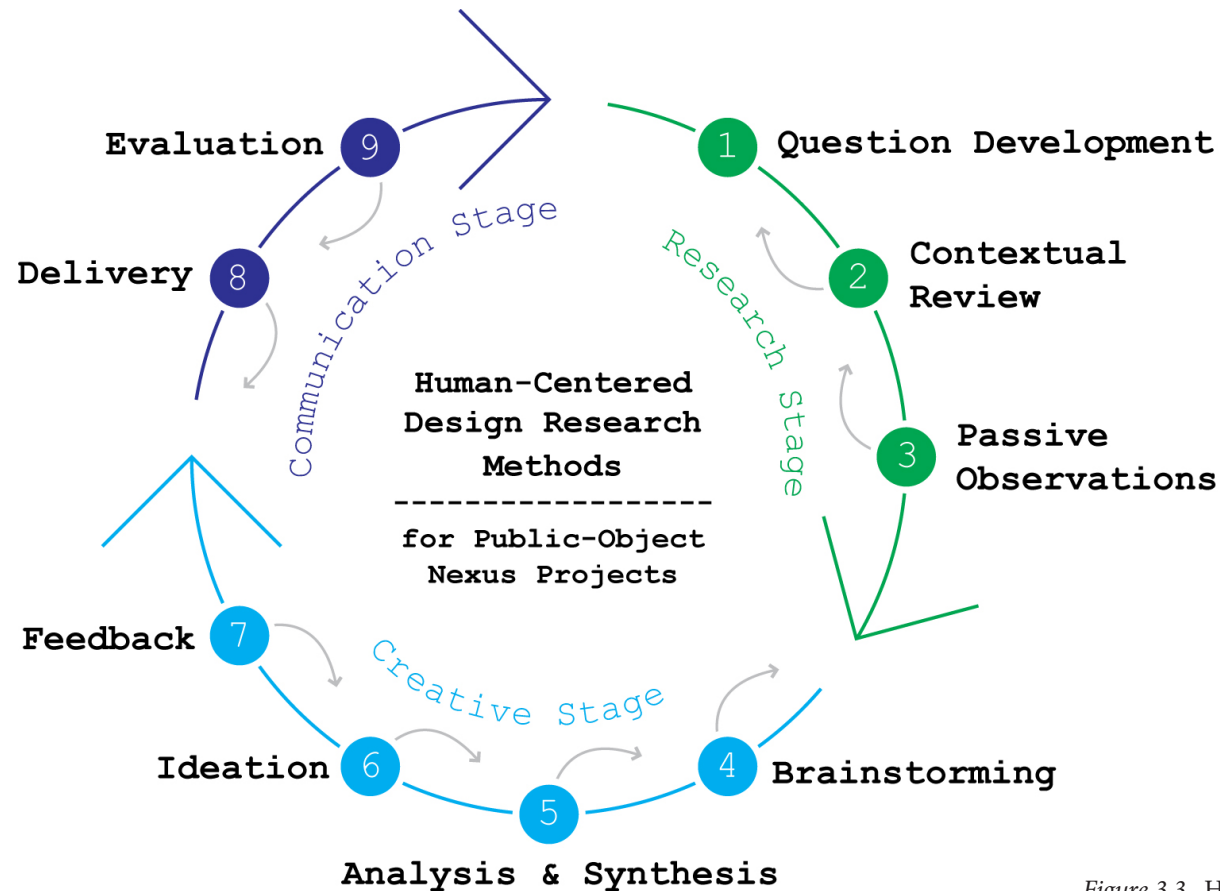
Figure 3.3 Human-Centered Design Research Methods

QUESTION DEVELOPMENT

The development and consistent refinement of a creative research question is considered a primary method in creating a strong foundation for the human-centered design process. Jones (1992) and Deasy (2003) explain that much of the creativity implicit in a design process is exhibited at this early stage with the originality of the questions one asks.

This study was a practice-based academic exercise in which a central research question (inquiring into the effectiveness of urban furniture design) was developed at the initiation of the project. An appropriate design research methodology was then crafted based on the central question, and supported by a series of sub-questions and associated individual projects - each addressing related issues around the human-centered design of urban furniture.

CONTEXTUAL REVIEW

Understanding the context that frames a project is a crucial step in developing a critical position that can contribute to the project's knowledge base. Gray and Malins (2004) explain, "The contextual review is a major part of any research project, its lifespan being as long as the project itself" (p.35). This method can also be referred to as 'recognizing existing knowledge' – a process that involves identifying what has been addressed, when, where, and by whom, in addition to what has not yet been addressed (Gray and Malins, 2004). A comprehensive contextual review establishes a framework in which the tangible 'gaps' in knowledge can be revealed, and the project positioning can be established. Contextual reviews for this study consisted of two parts: (1) Literature reviews, and (2) Surveys of existing design.

- Literature Review

In establishing an original position for design research, it is important to explore the context in which the research sits, and this is often most clearly done through reviewing the work of others in the same field (Ridley, 2008). A crucial aspect of academic research acknowledges and connects to the work of others (Ridley, 2008). The literature review is where connections are made between the source texts, and where the researcher can engage with said text that underpins their research. 'Reading,' in relation to academic research, is a generally a process that will last from the beginning of a project to the end (Ridley, 2008; Gray and Malins, 2004).

In relation to this study, the literature review was used as a discrete method in itself to broadly explore a critical discourse of human-centered design for public spaces and the relationship between people and designed objects. In addition, the method was employed within sub-projects to investigate more specific issues as necessary.

- Survey of Existing Design

Within a design context, it is important to survey design work that has come before. Often such work is visual or physical - in the form of objects, products, and/or conventional archetypes of design. Established human relationships and perceptions of such objects might also exist in anecdotal fashion. Surveying existing design can help to position ones work within the discipline and aid in informing the new possibilities.

Surveys of existing design were conducted during the initial stages of this study to map urban furniture typologies and explore existing innovations in urban furniture design. Sub-question stages also utilized this method to more specifically understand current market offerings and related design typologies.

PASSIVE OBSERVATIONS

In the research stage, building an understanding of human behavior and the connection to product design is perhaps most effectively developed through observations. This is because people often act differently than how they say they will (CDI, 2009). As a staple of qualitative inquiry, passive ethnographic observations can help the design process maintain a central focus on people (IDEO, 2006), while enabling a deeper understanding of the broader social realities of the participants observed (Hesse-Biber & Leavy, 2006). In context of this study, the passive observation method draws from 'ethnographic observation,' defined by Ireland (2003) as "a research approach that produces a detailed, in-depth observation of people's behavior, beliefs and preferences" (p.26).

According to Julier (2000), one of the primary advantages of using ethnographic observations to inform design is the illumination of patterns of consumption and attitudes towards products that market surveys and focus groups do not reveal. Furthermore, 'ethnography' is thereby defined by an articulation of these patterns via detailed descriptions and strong interpretations (Julier, 2000). Resulting ethnographic representations may be used to provide enhanced "comprehensive intellectual leverage for analysis and theory generation" (Plowman, 2003, p.34). The passive observations for this study served as essential pieces of the "ethnographic puzzle" (Hesse-Biber & Leavy, 2006) where a combination of photos and field notes could be used for analysis and gaining insight.

The observation procedure was employed in reference to IDEO's Method Cards (2006) and the CDI (2009) "P.O.I.N.T.S." observation procedure. The Method Cards present a variety of techniques for observation such as behavioral mapping, time-lapse photography, contextual diagramming, characteristic sketching, and user shadowing – all in an effort to better understand the process and interaction a user experiences with a designed object or environment. CDI's "P.O.I.N.T.S." method offers a simplified set of key principles to consider when making observations. For this project, both references aided in the methodical observation of people and objects in public spaces; illuminating patterns, nuances, and unmet needs that served as inspiration for the design of improved public urban furniture. The full method and results from the passive participant observation phase of this study are presented in detail in chapter 4.

BRAINSTORMING

Brainstorming, a method for rapid collaborative idea generation, is a skill that needs to be honed, and therefore requires consistent practice. Kelley and Littman (2001) advocate engaging in creative brainstorms on a daily basis in order to instill energy and momentum to carry a project through its more pressured or monotonous periods. Additionally, brainstorming allows participants to approach a problem from different perspectives, or shed new light on aspects of the project that seemed difficult before. The method of brainstorming offers a rationalistic way to use the imagination

for catalyzing the generative stages of a design process (Jones, 1992). Employing this method involves a focus on quantity over quality. IDEO (2010) explains that the process is characterized by the generation of many ideas in order to discover just a few that are truly inspirational. Through out this study, brainstorming was used as a primary creative method, and is described in further detail within the respective practice-based portions of this thesis.

ANALYSIS AND SYNTHESIS

Often situated at many points throughout a creative process, analysis and synthesis is described by Brown (2009) as a fundamentally creative act of extracting meaningful patterns from loads of raw information. This creative process is steeped in "pattern-making" which attempts to transform a complicated divergent problem into a simple one where decisions can be made about what is worth emphasizing and what may be overlooked (Jones, 1992). IDEO (2010) refers to this transformation as turning "stories" into "strategic directions." In design, value judgments must be made to determine a design direction. Brown (2009) explains that basing important decisions on often interpretive and intuitive 'hunches' can seem frustrating and/or risky, but it is this act of interpretation that can lead to truly breakthrough ideas. The process for conducting analysis and synthesis was aided through a mapping technique used to intuitively arrange the critical elements derived through creative processes (Buzan, 1993).

- Triangulation

Triangulation, a technique used in analysis and synthesis, is described as a validity tool (Hesse-Biber & Leavy, 2006). By using two or more different methods to approach the same research question with the objective of finding "convergence" in research findings, validity of research results can be enhanced in situations where results overlap (Hesse-Biber & Leavy, 2006). Triangulation was used in the Public-Object Nexus as a method for achieving a final concept direction within individual projects, and for developing the findings within the final discussion of this thesis.

IDEATION

Ideation is the process of generating, developing, and testing ideas (Brown 2009). This method was situated directly in the middle of the transformative stage of design research to help facilitate the translation of research into tangible ideas. Specific ideation methods were used to quickly develop a sizable evolution of ideas (through sketching and model-making) that were later assessed for poignancy. This method often resulted in a diversity of concepts that ranged from overarching ideas, to specific product details. Through the process, new issues and constraints, as well as and a range of varied solutions, were illuminated. For this study, ideation typically constituted the first phase of design refinement, using the techniques of sketching, scale-model making, prototyping, and computer-aided design. These are detailed as follows:

- Sketching

The positioning of the ideation method lies somewhere in between generative brainstorming and concept testing. In this study's adapted HCD methodology, the ideation method was primarily performed through iterative drawing and scale-model making. In practice-based

research, Gray and Malins (2004) suggest that drawing/sketching provides an accessible space for experimental thought in which the "non-precious" medium encourages a large range of visual thinking that can be tracked and reflected upon.

• Scale-Model Making and Prototyping

Where two-dimensional information is insufficient for understanding and communicating the complex aspects of design such as form, structure, and texture, 3D modeling and prototyping provides multidimensional and tactile data that can facilitate formal design development (Gray & Malins, 2004). In terms of the HCD research methodology, prototyping is considered a creative thinking tool, and its use is encouraged early in the creative stage of design development (Brown, 2009). By making ideas real and tangible, a prototype can illuminate design issues that might have otherwise not been acknowledged, offering an opportunity to iterate and refine ideas more quickly and successfully (IDEO, 2010). The objective of prototyping is not necessarily to build a working model. Rather, it is to give form to an idea to better understand its strengths and weaknesses (Brown, 2009). Through prototyping, holistic forms (in addition to detailed design elements) can be developed and evaluated. For prototyping to be most valuable, designers should avoid becoming prematurely attached to a particular idea or form in the initial stages, instead allowing intuition and reflective action processes to fully develop in order to explore a wide range of possibilities (IDEO, 2010).

Prototyping was used throughout this study to explore issues of three-dimensional form, material strength and durability, ergonomic user-testing, and concept salience. With the aid of modern workshop tools and fabrication techniques, scale models and prototypes played a crucial role in the development and communication of this study's urban furniture concepts.

• CAD

Computer-Aided Design (CAD) was also an invaluable ideation technique used in the Public-Object Nexus. Computer-based design tools can provide three-dimensional renderings that facilitate varied perspectives on a design, elucidate otherwise unnoticeable details, and communicate design intent with realism (Utterback, Vedin, & Alvarez, 2006). Although, Utterback et al. (2006) offer caution with the over-dependence on CAD, in which design consideration can too readily focus on minor details rather than broad principles. For the Public-Object Nexus, CAD was used extensively and a primary means of concept communication.

FEEDBACK

Particularly when designing for people, a collaborative atmosphere of feedback is a critical component of the HCD methodology. Feedback plays a central role in enabling collaborative, well-informed choices to take place though the appreciation of varied points-of-view (McIntosh, 2010). The HCD methodology specifically stresses the criticality of bringing varied opinions back into this stage of the design process, which aids in concept iteration and refinement that more effectively addresses a diversity of user-

needs and preferences (IDEO, 2010). Because the individual projects within this study were hypothetical in nature, the feedback method primarily consisted of critical discussions with design colleagues and others close to the researcher. Although these discussions wer often informal in nature, they proved to be a crucial influence in the decision making and conceptual development processes.

DELIVERY

In the communication stage, delivery refers to the particular phase of concept resolution where final design concepts are formally presented. Delivery necessitates the significant effort of developing, arranging, and presenting a series of design representations that include concept renderings, design details, and explanatory texts. Delivery constitutes a crucial step in the design process - in that final concept presentations serve as a vital communication bridge between the designer and external stakeholders, such as clients and users. For the Public-Object Nexus, a comprehensive visual delivery ensued in the communication stage for each individual sub-project. The delivery presentation materials produced were essential in communicating design intent, and enabling an informed evaluation.

EVALUATION

In design research, evaluations are used to determine the value of something and assess its worth (Gray and Malins, 2004). The key objective of an evaluation method is to reduce uncertainty and inform further design development (Jones, 2002). At the culmination of this study, a focus group and expert evaluation were undertaken to test the viability of the design concepts proposed, and at the end of each individual design project, personal

reflections were recorded to inform this study's research conclusions.

- Focus Group

Focus groups are a form of qualitative research loosely structured around obtaining opinions related to a specific topic. Focus groups usually consist of a small number of individuals (3-10 people) who are selected based on a set of pre-specified qualifications that render them appropriate for an effective evaluation (Edmonds, 2001). The focus group used in this study utilized a group of individuals from outside the design profession in order to ascertain opinions less partial to design. Some of the most common uses of a focus group include: positioning products or services, testing new concepts, and testing usability of a product (Edmonds, 2001). For this study, the final practice-based concept, The Buttress, was evaluated by an informal focus group as a means for generating an outsider's perspective on the design. Results from the focus group are covered in the respective project evaluation in chapter 8.

- Expert Interviews

Evaluations through expert interviews represent a means of attaining factual information from individuals with specific knowledge on a given subject. The professional experience that experts possess can instill an invaluable cross-reference of expert knowledge for a research project. The interviews conducted for this study followed Kolb's (2008) marketing research technique in which the interviews were generally short in duration, and followed two phases: *opening and questioning*. Experts, drawn from the field of professional public space design and

development, were consulted at the final stage of this study in order to obtain a qualified evaluation concerning the viability of proposed design concepts, and to broaden the perspective around the challenges to implementing innovative urban furniture. The full procedure and analysis of results for this method are explicated in the expert interviews chapter 9.

• Personal Reflection

As a key component of action research, the method of personal reflection constituted much of the embodied knowledge that was developed through this project. The process of reflecting on design is often what can help a researcher / practitioner make sense of a problem or question that initially made no sense (Schön, 1983). Crucial to this process is the ability to critique personal assumptions, beliefs, and modes of practice, at all stages of design research. From self-reflective critiques, new processes of understanding and approaching design problems can be achieved. For the Public-Object Nexus, personal reflection was employed throughout the duration of the study. Particular reflective conclusions are summarized at the end of each individual design project chapter.

4. Passive Observations

4.1. Introduction

In order to begin to explore the overall project aim of identifying design opportunities that can more effectively support active public lifestyle, passive observational research was selected a key research method. The purpose of observation is to document, analyse and categorize key patterns of human activity. As a crucial part of a human-centered design process, observations are considered an invaluable research tool for uncovering insights that can inform design (Suri, 2005). The method of passive observational research was selected, in part, due to the accessibility of the subject matter; public spaces and public artifacts. It was the assumption of the researcher that the relative ease and accessibility associated with documenting public space would enable the collection of abundant data. Subsequent insightful interpretation of this data could then be used to underpin the design process. The overall outcome of passive observation is to identify key insights to be later used in developing frameworks that drive innovative design.

A series of key public spaces within the Auckland City Central Business District were selected as the focus of analysis and evaluation, with documentation recorded through a collection of photographs and detailed notes. Research was conducted to capture a range of human activities in these spaces. These included frequency of use, desirability, perceived value, and general effectiveness of existing urban furnishings.

4.2. Objectives

The principal objectives of the passive observational research process were to:

- Create detailed notational and photographic documentation of selected public spaces,

- Identify key activities and patterns regarding the use of public artifacts,

- Develop a deeper understanding of the physical factors that affect the viability of urban furniture,

- Identify key insights leading to opportunities that might exist for improvement and innovation of urban furniture,

- Develop a design framework to inform practice-based design processes aimed at developing a series of conceptual urban furniture pieces

4.3. Observation Methodologies

The methodology for this design research stage draws from the ethnographic practice of participant observation. Dewalt and Dewalt (2011) define participant observation as a qualitative method for developing a holistic understanding of the nature of phenomena under study. Jorgensen (1989) explains that participant observation is an exceptional method for studying processes, relationships, events, organizations, continuities, patterns, and socio-cultural contexts.

For the Public-Object Nexus project, public space, and the human-object interactions within, were the phenomena under scrutiny. When public spaces are observed, knowledge can be gained about how they are actually used, rather than how one might assume they are used. Observations enable the quantification of what would otherwise be considered intuition or opinion (PPS, 2000). As a staple practice of qualitative inquiry, observations help the researcher to understand social realities from the perspective of the participants they are studying (Hesse-Biber & Leavy, 2006). This may lead to a deeper appreciation of participant needs and desires. Hesse-Biber and Leavy (2006) describe the role of the ethnographic observer as one who enters the social worlds of research settings in order to hang out, observe, and record social life, and then provide thick descriptions that elucidate a true social context.

Sociologically rooted ethnography informs the theoretical underpinning for passive observations within this study. Historically, ethnography has been associated with the field of anthropology in which research is conducted on foreign cultures in order to capture understanding of a "native" population-the customs, values, and artifacts associated with a given group. In the late 19th century, a more contemporary sociological practice of ethnography developed based on emerging social reform movements (Hesse-Biber & Leavy 2006).

Plowman (2003) explains that ethnographic accounts can be both descriptive and interpretive requiring analytic rigor and inductive analysis. Techniques within the method lead to an inductive process of deciphering what the data means (Plowman, 2003). Kelly (2001) explains, "It is not enough to see or hear what people say. You have to interpret and intuit shades of meaning to divine their underlying motivations or needs" (p.39).

In a design innovation context, Kelley (2001) recommends a type of observational research that is a "mixture of hyper-observation and synthesis" (p. 38). For this project, passive public observations were aimed at instigating concepts, generalizations, and theories grounded in human reality (Jorgensen, 1989). These were subsequently used to inform design opportunities. This required a flexible, open-ended process for identifying and defining problems, concepts, and appropriate methods for collecting and evaluating data.

4.4. Study Locations

To select field locations in which to conduct passive observational research, Dewalt and Dewalt (2011) explain that, in an ideal situation, the question drives the site selection. For the Public-Object Nexus, field locations were chosen based on the scope of the study and following characteristics:

- The space was genuinely 'public' – allowing equal access to all people
- A diversity of existing urban furniture pieces
- A moderate amount of user activity throughout the day
- An urban hardscape 'plaza and streetside' context (as opposed to a public park)
- Small to medium size space that can facilitate sufficient assessment by the researcher
- Close proximity to the Auckland Central Business District
- Close proximity to the researcher's home base

Sites for this study were chosen to generally represent Auckland CBD public areas. It was anticipated that the sites selected would be comparable, offering the opportunity for the cross-referencing of observational insights. In addition, the genuine public nature and moderate activity of people would help to facilitate passive and unobtrusive observation and documentation by the researcher.
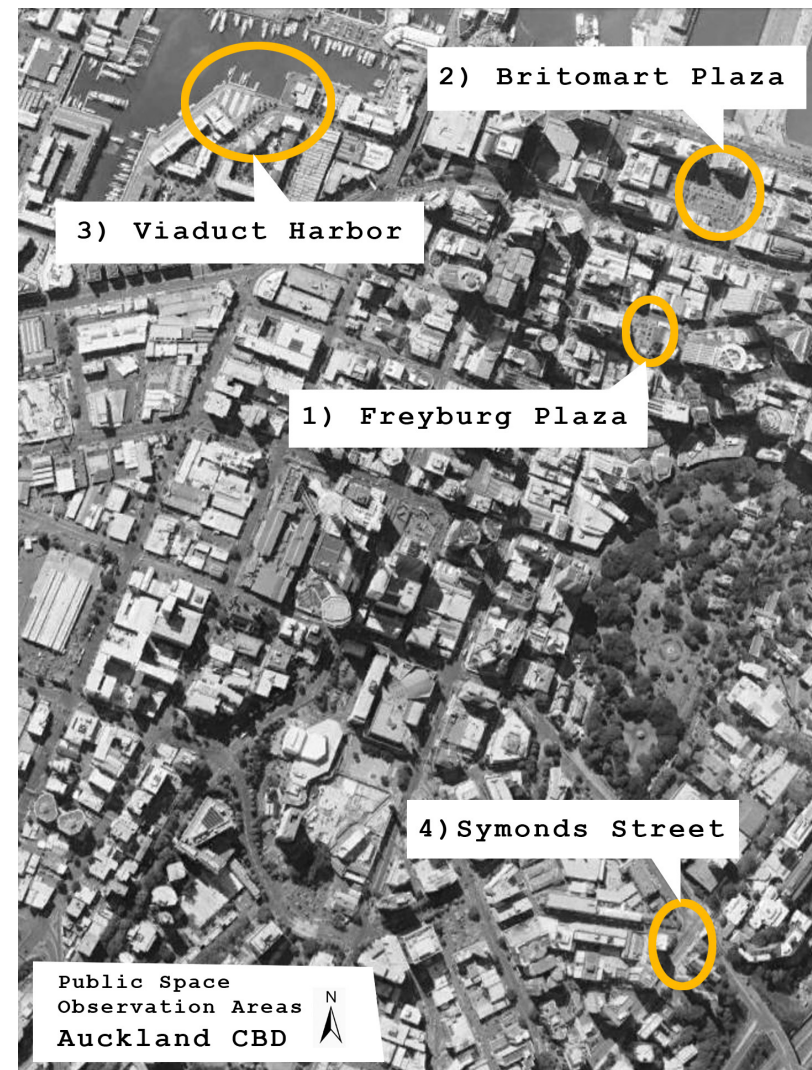
Figure 4.1 A display of the selected set of corresponding observation study locations within the Auckland Central Business District.

Four public space locations in the CBD of Auckland were selected as appropriate settings for conducting passive observations for the Public-Object Nexus study. These included the following:

1) Freyburg Plaza on High Street:
A small hardscaped urban plaza with easy public access, a variety of public amenities, and an abundance of mid-day use.

2) The Viaduct Harbour:
A series of waterfront plazas and promenades along Auckland's recently reconstructed central harbour. The provision of urban furniture is ample and use is intermittent.

3) The Britomart Plaza:
A newly constructed plaza located above Auckland's underground train station. Currently at a stage of half-completion, as its construction phasing aligns with the progression of adjacent building projects.

4) Symonds Street:
A section of Symonds Street within the University district that contains a collection of periodic urban furniture arrangements – most of which corresponded to the City's public transportation infrastructure.

Figure 4.2 Individual study locations

4.5. Passive Observation Procedure

The ethnographic process of participant observation informed the methods employed for this research. The process required the researcher make extensive visits to research locations to observe activities of inhabitants (Hesse-Biber & Leavy, 2006). Similar to 'passive ethnographic practice,' the process implied a passive emersion of the researcher into a given environmental context – in this case, a series of public spaces within Auckland City.

ETHICS

Passive observations of public spaces rendered users of these spaces as passive participants, meaning that no intervention was enacted by the researcher that would alter the normal course of everyday behavior. In this way, the physical health and safety of users of these public spaces under observation was not endangered by any research operations.

The protection and/or concealment of the identities of individuals who became subject to this research was a primary concern of the effort, and material has not been published of those who have expressly objected to participating in the research. The research findings from this process are submitted for the sole capacity of informing new product design opportunities. For this research process, ethics approval was sought after and approved with conditions (AUTEC Reference Number 10/108).

PROCEDURAL STAGES

Kemp (2001) explains that the aim of participant observation is to identify what is going on by observing with as open a mind as possible. With this aim, Kemp (2001) describes the key stages in observational research:

- Selecting a site for observation,
- Observing,
- Detailed recording,
- Formulating hypotheses,
- Repeating observations, and
- Establishing saturation point.

In the context of the Public-Object Nexus mixed-methods approach, observational research served as a means of informing design. Therefore, the stages of research proceeded to a point in which observational insights could be developed, and then tested and validated through a triangulation of alternative methods. Dewalt and Dewalt (2011) affirm that one of the most effective uses of observation methods is for generating hypotheses that can be cross-referenced through other methods.

DATA COLLECTION

Primary data collection was administered through a succession of hand-written notes and supported with photographic and hand drawn sketches. Note taking was structured around identifying design details, common behaviors, and patterns of use. An important component of note taking was the attempt to make tacit knowledge explicit through expounding the everyday occurrences of public space (Dewalt & Dewalt, 2011).

Several data collection techniques were employed as follows (IDEO, 2006):

- Fly on the Wall - Observing and recording behaviour within its context, without interfering with people's activities.

- Behavioural Mapping – Tracking the positions and movements of people within a space over time.

- Behavioural Archaeology – Looking for the evidence of people's activities inherent in the placement, wear patterns, and organization of places and things.

Observations were conducted primarily around mid-day and during periods when it was expected that the largest number of people could be observed interacting with the urban furniture. As the intent of this study was to examine detailed human-object relationships in public spaces, observation scheduling predominantly revolved around the potential to capture these interactions in progress.

For each location, the researcher was situated in a non-covert manner with the objective to take written notes and photographs documenting the current state of urban furniture and the correlating human-activity. *Figure 4.3* offers a depiction of a typical research observation point, and orientation for conducting observations (at the Britomart plaza in downtown Auckland). This protocol adheres to Hesse-Biber's (2006) depiction of the "complete observer role" which requires the researcher's identity to remain hidden (p.204). "The complete observer role allows the researcher to study a setting without interfering with its day-to-day operations, thereby minimizing the

bias (or reactivity) that might result from the presence of the researcher interacting and possibly changing the very nature of social relationships in the setting." (Hesse-Biber & Leavy, 2006)
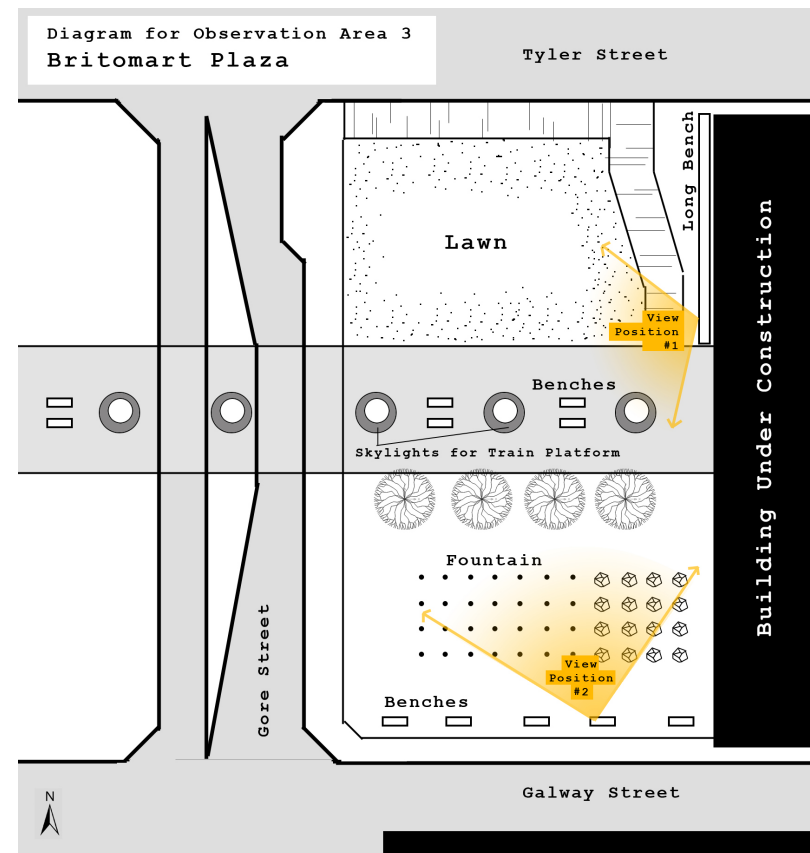

Figure 4.3 Diagram of example research observation points at Britomart

ANALYSIS

The process used for assessing the data collected refers to Jorgensen's (1989) analytic strategies that recommend identifying essential features, patterns, and relationships, comparing and contrasting, and formulating categorizations. Through the recognition of common patterns as well as idiosyncratic events, insights were developed and then cross-checked through other methods (Dewalt & Dewalt, 2011). The validity of insights was then tested in subsequent design practices and evaluation phases.

In analyzing field notes and other data, Dewalt and Dewalt (2011) suggest a three-pronged approach including data reduction, data display, and interpretation and verification. It is a highly iterative approach where data is transformed, organized, and then interpreted, and conclusions are drawn and tested at every stage of the research process (Dewalt & Dewalt, 2011).

PHASES

Initial discovery phase:

This phase was a preliminary effort in which a 'haphazard' passive observation informed by ethnography was conducted absent of major preconceptions by the researcher – based on the "intuitive approach" advocated by Simmel (as cited in L'Aoustet & Griffet, 2004). The goal of this initial phase was to explore various factors that might play into the facilitation of urban furniture use, and to start identifying patterns associated with design and behavior. In general, the central research question around how product design might more effectively support active public life underpinned this phase. Each study location was visited an average of four times during this phase for approximately one hour per

visit – the entirety of the phase lasting three weeks.

Focused investigation phases:

More focused public observations were employed in parallel to design practice processes as necessitated by the specific sub-questions of each project. Within these phases, the goal was to inform a specific design inquiry and/or test research hypotheses that were being developed. Observations were conducted on an "as-needed" basis and usually satisfied by an average of three study location visits. Documentation and key insights derived from these focused observations are detailed in the respective practice-based project chapters of this thesis.

4.6. Summary of Observational Insights

The outcome of initial public space observations is summarized in the following sections:

4.6.1. Contextual Influences

MACRO FACTORS

Although observations for this study were primarily focused on the micro-level interactions between urban furniture pieces and their users, it was impossible to discount or ignore the impact that macro-level contexts have on making a public spaces successful. Through observations of four study locations (listed above), it quickly became apparent that a set of factors, often less related to the specific 'design' of these spaces, was determining whether they were or were not used. That is not to say that the design of spaces didn't apparently affect their success, but it did seem prudent to detail some of these external factors before focusing on internal factors and patterns of use related to micro-design provisions.

LOCATION, SCALE, AND CONTEXT

To describe the impact of contextual factors on urban furniture use, simple observations of the Freyburg Plaza on High Street offer a good example. Perhaps one of the most widely used and evidently popular public spaces in Auckland's CBD, the Freyburg Plaza seems to exhibit many of the qualities that constitute a lively public space. A lunchtime visit to the plaza during fair to favorable weather conditions almost any day exposes an abundance of human activity – to the point that finding a place to sit, within the plaza's extensive seating provisions, is almost difficult. From a contextual urban

perspective, the plaza's physical location is most likely one of the overriding contributions to its success. Positioned directly in the middle of the bustle of Auckland's fashionable high street area, the plaza sits comfortably enclosed on all for sides by a dense mix of vibrant urban environment. This positioning creates a captive demographic likely to use any public space that is conveniently and attractively available.

The physical scale of the plaza was also observed to be a determining factor for use. At key periods during the day, Freyburg Plaza seemed to exhibit what felt like a critical mass of human presence. The scale of the space is strategically proportioned so that not too large a number of people have to present before it feels like an important and popular place where one could be "seen." On the factor of scale, Carr et al. (1992) explain, "Squares are most successful when they are under seventy feet (twenty meters) in diameter… In a plaza this size people are able to make out the faces and half-hear the talk of those around them, which encourages a sense of social connection, increasing opportunities for interaction" (p.120). The importance of a comfortable scale becomes even more apparent when comparing the favorable scale of Freyburg Plaza to the disproportioned scales of the other spaces within this study.

MOVEMENT AND REST

Another important consideration related to critical mass, also exemplified at Freyburg Plaza, is the balance of movement and rest. Through this study, movement and rest were observed as mutually symbiotic activities. Sitting at Freyburg Plaza is interesting for users, in part, because there is a constant flow of people traversing through the space – making it an exciting place to

rest. Conversely, walking through the space is interesting because it offers a short cut in which 'movers' can quickly experience the urban 'scene.' Whyte (1980) describes circulation and sitting as complementary elements, offering accounts from his own extensive observations in which people are more likely to congregate close to a steady pedestrian flow. For these scenarios, Whtye (1980) adds, "If there is some congestion, it is an amiable one, and a testimonial to the place" (p.33).

Figure 4.4 Freyburg Plaza on a nice autumn day around noon

USERS

Observations also illuminated the importance of understanding the demographic. An evident effect of the public space's location seemed to have a direct correlation to who is actually using the space, or the demographic makeup of the space. It seems that for most of the public spaces observed, their locations in the context of the city determined who might have immediate access and interest in the space. The Freyburg plaza, for instance, appeared to be dominated by a majority of young to middle-aged professionals and retail employees – both apparently taking breaks from their work environments. In addition to this group, the space was also made up with a smaller ratio of shoppers, families with small children, vagrants, and others; a general demographic typical to any downtown shopping/office district.

In contrast, the public spaces that comprise the Viaduct, Auckland's downtown harbourfront district, were often additionally composed of tourists (directed there by cruise ships and/or travel guides). The observed addition of the tourist demographic in the Viaduct greatly alters the ability to categorize behavior of the average user, as tourists are often motivated by a different set of objectives than locals. Developing an appreciation for the type of users that might typically use a given space becomes important not only in gearing design interventions towards them, but also in understanding what groups are absent and could therefore be accommodated for through design.

4.6.2. Review of Urban Furniture

PROVISION

As the main focus of this study primarily revolved around urban furniture, perhaps the most striking initial observation was the sheer abundance of urban furniture populating each of the four study locations. The provision of furniture pieces was observed to be consistently profuse, yet the use of pieces varied widely from space to space. This led to the assumption that the simple provision of urban furniture was not enough to garner use - an assumption partly inspired by the swaths of under-utilized pieces in Auckland's Harbourfront district.

Whereas an almost excessive provision of urban furniture was a commonly observed scenario, in many cases, the peices often consisted of a hodge-podge of varied design vocabularies that physically and visually cluttered spaces. This often occurred in a fashion that appeared to be devised as an 'after-thought' or retrofit. A classic example of this was the clustering of objects at the Britomart Plaza (*Figure 4.6*). Addressing this kind of 'cluttering' was later revealed to be a priority for city intervention in the coming years. As an initial cue for design innovation, it seemed that in many instances there was an opportunity for greater efficiency, either through combining the construction of furniture elements and/or simply placing them more strategically in space.

Figure 4.5 The exceedingly long row of benches along Viaduct Harbour

Figure 4.6 Clustered furnishing at the Britomart Plaza

PLACEMENT

A prime example of the potential for urban furniture efficiency was demonstrated by the rubbish bins at Freyburg Plaza. Instead of interspersing the bins throughout the plaza adjacent to congregations of users, the bins are located at the entry/exit points of the plaza – offering a convenient "dump spot" for users, and necessitating fewer bins. In this situation, the provision of fewer bins meant the bins were often filled to capacity more frequently than at other plazas, but the tradeoffs of material savings, reduced clutter, and facilitated maintenance seemed like advantages. This observational insight demonstrated a type of scenario where an understanding of actual human behavior (the fact that people will indeed carry their rubbish and dispose responsibly) can lead to more effective provisions of public design.

CONSISTENCY, STYLE, AND MAINTENANCE

The mishmash of urban furniture design styles and formal vocabularies also led to the observation that a consistency of style and material across urban furniture elements is a rarity. This can mostly likely be attributed to the varied life-cycles of differing products – some being more prone to degrade through weather and/or extended use than others. This apparently results in a varied assortment of furniture replacement cycles, making consistency over the years difficult. A myriad of materials, styles (harkening to many different eras), and apparent levels of permanence characterized the display of urban furniture within each study area.

Despite the apparent success and popularity of the Freyburg Plaza on High Street, the urban furniture elements were not necessarily in good condition, nor an expression of 'good design.' Much of Freyburg's seating was worn, rusty, bent, and disheveled. Other elements such as the bollards and rubbish bins were also showing signs of age – both physically and stylistically. Yet these factors did not deter use. It's possible that, in fact, they bolstered use. Chapman (2005) explains that signs of use equate to "signs of life" - a quality that can elevate an objects status beyond the "bland anonymity of a mass-produced world" (Chapman, 2005, p.116). This quality, which he refers to as "patina," is certainly evident in the human-scaled elements of Freyburg Plaza, imparting on the elements a sort-of unique character that could not necessarily be intentionally designed. In this observed scenario, the 'style' and 'identity' of the given objects at Freyburg seem to be somewhat inconsequential. The other three areas of this study also showed periodic evidence of deterioration, from broken wood slats on benches, to chipping paint, to loose hardware, to stained and tainted surfacing. The general upkeep and maintenance of furniture pieces offered some cues as to how varied materials fare in outdoor conditions overtime, leading to the acknowledgement that a more holistic materials-based study would be an appropriate step for continued research and development beyond the scope of this study.

Figure 4.7 A Viaduct Bench

Figure 4.8 A Britomart Bench

4.6.3. Key Observational Insights

• Preference for Flexibility

A key observation of this study was an identified pattern of preference given to urban furnishings that offered flexibility in use. Instances such as the low concrete ledge bordering the fountain at Freyburg Plaza (pictured in *Figure 4.9*) offered insights into why users might prefer open-ended, flexible design provisions. First of all – the ledge is "easy," meaning it is simple to understand, clean in form and material, and easy to use. The flexibility of the ledge is imparted by its adaptable purpose, affording myriad ways to use the piece.

Also, people who visit the plaza can intuitively assess the concrete ledge's capacity for use through its simple form and construction – this in contrast to an adjacent seating element (a high, sculptural perch surrounding a plaza tree) in which users were consistently confused by its apparent functionality.

With flexibility, or even the user's perception of flexibility, proportions seem to be a critical factor. The Freyburg ledge, for instance (*Figure 4.9*), demonstrated favorable proportions (a low height and broad sitting surface) that afforded a variety of resting positions. People were observed sitting on the ledge in an surprising array of ergonomic positions, and seemed to prefer the allowance to do so. Whtye's (1980) study of urban plaza seating

Figure 4.9 A low concrete ledge used for sitting at Freyburg Plaza

concurred that simply maximizing flat surfaces and the sittability of inherent features offers a tremendous choice of sitting combinations that enhance the viability of a public space. Features within the Britomart and Viaduct areas also offered successful exemplars in choice of sitting combinations. The long wooden seat ledge in addition to the adjacent turf area at Britomart were popular and could be found being used in a variety of anatomical displays. During favorable weather conditions, the Britomart management occasionally offered an assortment of outdoor pillows peppered randomly across the turf. When available, these colorful outdoor pillows were often occupied by users –representing probably the most progressive display of innovation and/or experimentation with urban furniture observed in this study.

The pillows at Britomart highlight an aspect of flexibility, which is considered ideal for public spaces, yet difficult to administer: movability (Whyte, 1980). With the exception of the Britomart pillows, none of the observed public spaces provided truly movable and/or adaptable outdoor furnishing. Sometimes the arrangement of elements alluded to the organic placement by users, but elements were almost always fixed to the ground. The Britomart sign on castor wheels *(Figure 4.10)* is such an example where an attempt was made to make a street element movable, but the practicalities have yet to be resolved.
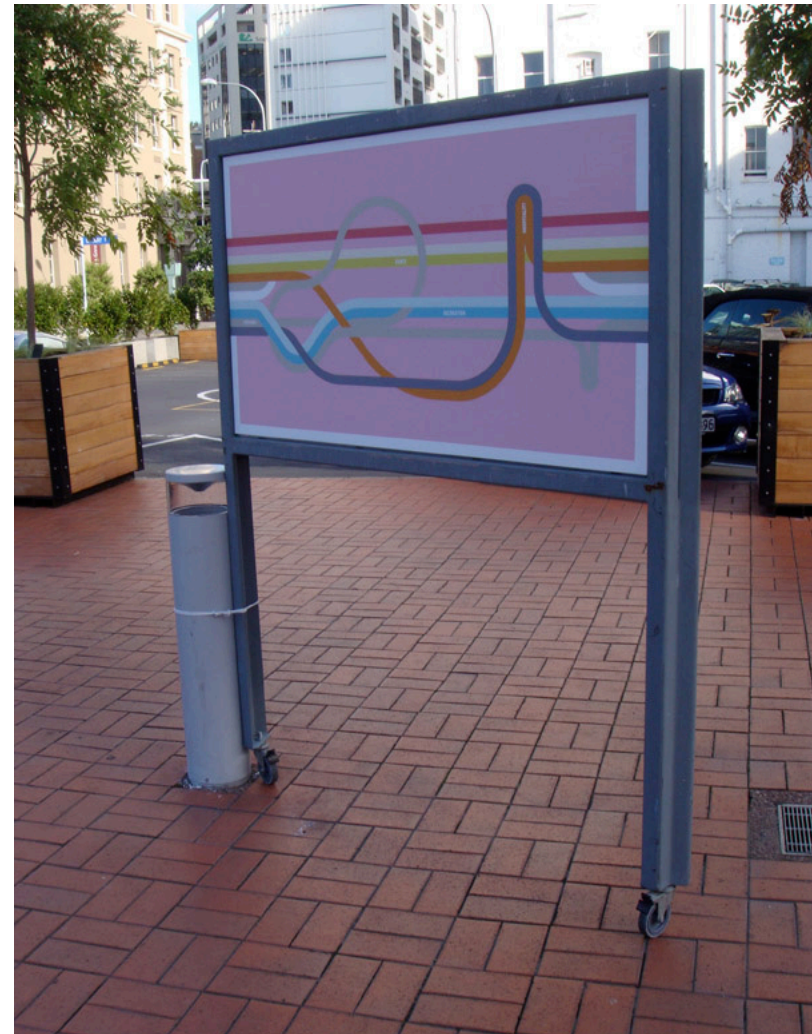

Figure 4.10 A Britomart sign on wheels tethered to a pedestrian street light

• Altered Ergonomics

Associated to the provision of flexible furnishings was the observation of altered ergonomics. In all four study areas, the physical posture of the people using urban furniture was often observed to be different from what the furniture element may have initially been designed for. People were observed lounging, putting their feet up, lying down, leaning on top, etc. – basically, in as many positions possibly afforded by the object. In these situations, people's inherent creativity and proclivity for dynamic interaction was demonstrated.

temporality of standing as a substitute for sitting in an office. This display of altered ergonomics illuminated the valuable alternative that urban furniture and public spaces might tender in the routine of daily living. Clearly, other factors beyond furniture motivate the public's inclination to freely enjoy a space, such as favorable weather (*Figure 4.11*). Yet, the tangible, touchable, human-scaled elements of a space seem to offer an essential link between people and the ability to enjoy such factors.

The use of bus shelters on Symonds Street, for instance, offered an ideal display of varied ergonomic behavior beyond what was intended by the shelter's furnishings. People were observed leaning on the posts, propped up against the back wall, or squatting and sitting on the ground, with the shelter used as a backrest. In the Britomart plaza, a pattern was observed of users preferring to stand or lean next to urban furniture elements rather than sit on the benches provided. The issue of bench cleanliness was observed to play into this pattern of behavior (not wanting to scuff up work attire), in probable addition to the

Figure 4.11 Britomart plaza users enjoying the sun

• User-Adaptation

Some of the most fascinating observations of public behavior in this study revolved around the unexpected reinterpretation of urban furniture intent. In these idiosyncratic displays, altered ergonomics and preferential use of flexible elements were observed to an extreme extent in which users stretched themselves and the capacity of given objects in order to serve personal ends. The majority of the urban furniture elements that populated these study areas seemed quite intentionally designed for specific purposes (serving those purposes to varying degrees of success), yet unintended uses were also occurring that were almost certainly not anticipated. Suri's (2005) collection of related research, termed *thoughtless acts*, concurs that "everywhere we look there is evidence of people's creativity in reinterpreting and adapting things, improvising solutions to make up for something that's missing or poorly designed" (p.167).

private moment, whereas the women in *Figure 4.13* have situated themselves, somewhat awkwardly, inside a concrete planter so that they may experience a social moment. Proclivities towards privacy and sociability, spontaneity and purpose, introversion and extroversion, were all observed behaviors, offering an indication that diversity was not just a desirable attribute of the public, but rather a given. An insight into the effective role of urban furniture was developed through these situations revolving around how much or little the design afforded users to enact their own intended use.

By recording or mapping the ways people use spaces, you can also learn a lot about what they want from a space. In fact, people will often go to extraordinary lengths to use a space in a particular way. For example, we have seen people use waste receptacles as seats, for sorting their bills, and for cooking clams. Often their actions speak louder than words. (PPS, 2000, p.51)

Observations of unintended uses, or object reinterpretations, did not necessarily crack the code of public socio-behavioral predisposition. In fact, it may have complicated behavioral understanding, in that many of these activities could not have been anticipated until the moment of actually observing them. For instance, *Figure 4.12* shows a man resting on a traffic bollard at the edge of Freyburg plaza experiencing a
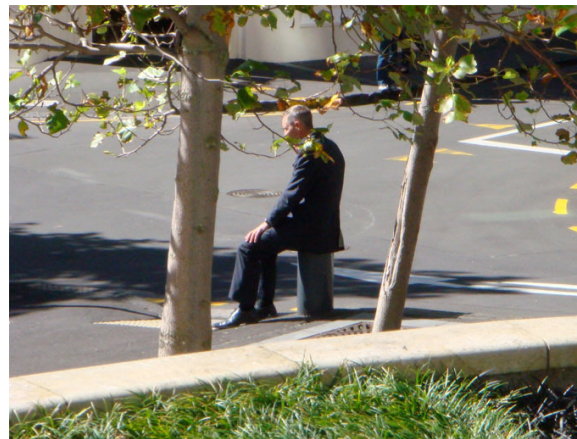

Figure 4.12 A man using a street bollard as a seat

Figure 4.13 A group socializing inside a plaza planter

• Activity as Primary Motivation

A reoccurring insight developed through this observation process illuminated the specific *activities* that people were engaged in as a driving motivation. It seemed that personal and/or group activity often underscored how and what people would use in a given public space. A frank way of describing this assertion is that people in public spaces were "into themselves" – in essence, primarily interested in their own objectives. The 'design' of public space and public artifacts seemed to concern users only in as much as it was useful to them in achieving their personal objectives. The caveat with this assertion is that 'objectives' vary widely – from reading a book, to eating lunch, to exercising, to people watching, to meditating, to enjoying the sun – though in most cases, people seemed to operate with a certain element of personal purpose.

This key observation is in accordance with Bill Moggridge's appeal for designing "verbs not nouns" in which design efforts focused on behavior rather than objects can lead to new and better ideas (Suri, 2005).
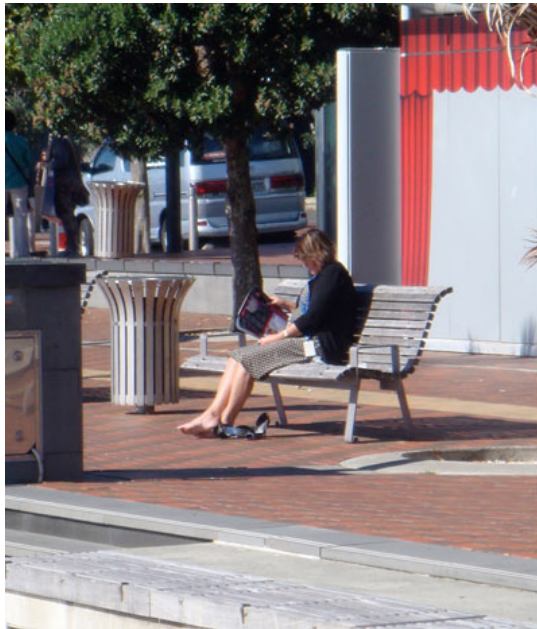

Figure 4.14 Reading a book in the Viaduct

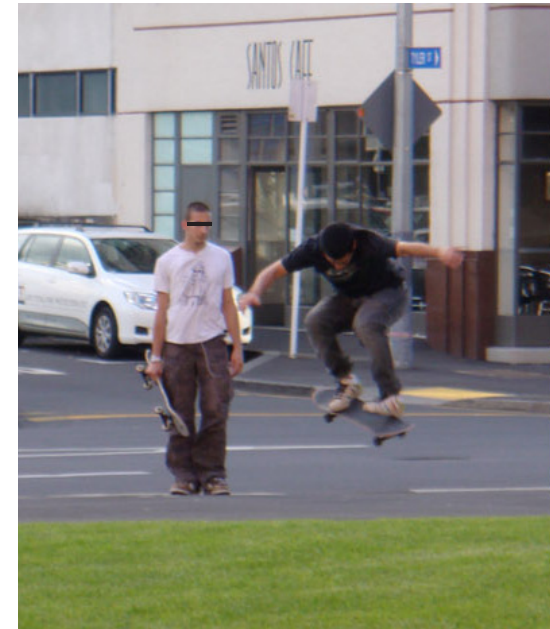*Figure 4.15* Eating lunch at Freyburg Plaza

Figure 4.16 Skateboarding at the Britomart Plaza

This observation also helps in realigning public design emphasis from accommodating *incidental* users to accommodating *intentional* users. Carr et al. (1992) explains that, contrary to prevailing thinking, incidental users usually make up a minority of the public space users. "Most people go to public open spaces for specific reasons. Some involve immediate needs – to get a drink of water, to eat lunch in a sunny area, or to rest. Others are long-range purposes and may be less obvious, for example, the need for a change or the opportunity to exercise" (Carr et al., 1992, p.87).

As observed, the manner in which people use urban furniture might be unexpected, yet an underlying purpose almost always appeared to govern this human-object interaction. The recognition of deliberate, often even premeditated activity as a primary motivating factor for users of public space can give an improved foundation from which the design of urban furniture can be enhanced.

4.7. Discussion

For this stage of research, conducting passive observations was an invaluable method for developing a deeper understanding of human-object relationships in public space. The initial phase of public observations was fruitful in capturing user-inclinations, and illuminating key insights for a formulated design framework based on *open-affordances* (detailed in chapter 5). In general, the key observational results from the process were, at first, somewhat unexpected. However, in most cases, when a behavioral inclination had been identified through this study, revisiting literature proved that others in the field had indeed encountered similar insights. An iterative process of cycling back and forth between research methods provided the 'triangulation' of findings necessary to reliably underpin an ensuing design process.

With specific regard to the passive observational procedure, this process elucidated the criticality of the passive aspect of this method. Even in public spaces where behavior and activity is 'out in the open,' the particular act of recording and documenting subject activity could affectively alter the normal course of activity in instances where people became self-conscious of being observed. For this reason, research documentation placed an emphasis on note-taking over photography, because writing in a journal seemed less intrusive and therefore less apt to influence everyday actions.

Many of the key observational insights identified through this study alluded to a certain level of user self-determination, in which people tended to visit and remain in public spaces for the purposes of fulfilling a need. Sometimes needs were personal (like reading a book, or smoking a cigarette), sometimes social (like eating lunch with friends), though it was not often that people were observed to deviate from their intended purpose. The influence of design appeared to be of secondary importance to the influence of activity in creating a meaningful connection to public space. Designed objects often served as mere 'props' to support activity, and appeared to be appreciated foremost for their functional value. Although this interpretation could be more effectively validated through further research and testing using other qualitative methods, it offers insight into an alternative approach for designing urban furniture that can be inspired by the potential for enhanced functionality and meaningful, human-centered affordances. A new framework for urban furniture design, based on the key observational insights of this study, is detailed in the next chapter.

5. Open-Affordances

5.1. Introduction

This chapter describes a framework for designing urban furniture to more effectively support an active public lifestyle. The framework, entitled open-affordances, was developed within the Public-Object Nexus study through a string of parallel research and design methods to inform the production of human-centered design for public spaces.

The open-affordances framework was formulated through a triangulation of public space and product design literature, passive public observations, and reflective practice. A review of literature in public space design theory suggested that the primary purpose of built public work should be to appeal to the needs and desires public users. However, indications show that these needs are often not addressed when public space is developed (Carr et al., 1992). Rather, a disproportional amount of design emphasis is instead placed on the macro-scaled visual aspects of public space design – an emphasis that is largely unnoticed by users (Wythe, 1980). Concurrently, passive observations of Auckland CBD public spaces suggested that the designed aspects of public space are principally meaningful in the way that *design* helps people to accomplish their personal goals and activities. This was particularly evident through the periodic observations of users adapting the originally intended function of objects to serve their own alternative purposes.

The open-affordances framework proposed by this study recommends a reoriented appreciation of people's dynamic needs, activities, and autonomous behaviors, which can then be accommodated with public design that 'opens' up both functional and visceral possibilities. The successful execution of open-affordances is carried out through a balance of three facets: *aiding activity, flexibility,* and *new human factors.* This study proposes that a design addressing the combination of these three facets can result in a considerable improvement to the vitality of public spaces.

5.2. Theory of Affordances

The term 'affordances,' with origins in cognitive psychology, refers to the "action possibilities" that an individual perceives are inherent to an object and/or environment (Gibson, 1979). As the term is derived from the verb *to afford*, and is essentially used to describe what an *object* or *space* affords (Suri, 2005). In terms of a public space, affordances could signify the possibility for sitting, resting, playing, eating, watching, sleeping, etc.

Gibson (1982) explains that affordances link the utility of things and places to the needs of users and their actions in fulfilling such needs. These needs are not just composed of immediate desires, but also the needs that arise in keeping users in reflective connection with their environments and able to contribute to the lifestyle they wish to lead (Gibson, 1982).

Affordances themselves are perceived and, in fact, are the essence of what we perceive. We do not perceive stimuli of retinal images or sensations of even just things; what we perceive are things that we can eat, or write with, or sit down on, or talk to. (Gibson, 1982, p.60)

The affordances of a design can be described as what it can offer to a user, i.e. what it provides or furnishes (or conversely does not). Therefore, the term emphasizes a particular relationship between user and design. Norman (2004) concurs in his assertion that affordances *are* a relationship. And in terms of the meaning that can be derived with designed objects; a users attachment is not to the object, it is to the physical and psychological relationship the object provides (Norman, 2004).

Krippendorff (2006) asserts that the true meaning of a design is created by the user through interaction with an object's affordances - the set of its imaginable uses. Where meanings concern possible uses, features such as reliability, flexibility, interaction, and pleasure all become important in creating a positive human-object relationship. Krippendorff (2006) argues that rather than attempting to appease a users extrinsic motivation, i.e. the goals and principles held external to the interaction with a design, a designer is better suited to facilitate intrinsic motivations. Intrinsic motivations rely on the pure enjoyment of using an object or engaging in an activity as the value and reward in itself, and this is where a designer can have the most significant impact (Krippendorff, 2006).

5.3. Emphasizing Open-Affordances

In design, the concept of 'perceived' affordances is commonly underscored through product development and user-interface design (Norman, 2004). This is generally because designers are concerned with communicating, through design, the express functionality that was intentionally built into the product. Perceived affordances are deemed important because the intended user-action should be perceivable and intuitive to the user (Norman, 2004).

In public design, affordances are important, but complicated by an element of diversity - diversity of people and activities that are intrinsic to the very concept of freely accessible public spaces. The effect is that a singular functionality is not always appropriate to the multifarious needs of a diverse range of users. Additionally, the public element seems to carry with it a certain sense of 'free-will' in which users feel free to treat urban amenities however they please. This behavior was evidenced through passive public observations.

Therefore, a more effective approach to humanizing public design is proposed through the concept of 'open-affordances.' – an approach that implies opening up the possibilities for what a design can afford a user. An open-affordances approach compels designers to strive for design that is based on creating unbound possibilities rather than specific outcomes. Dynamic and interactive qualities are emphasized as they open up possibilities for human engagement and more meaningful experiences. Verganti (2009) explains that it is the interaction between a user and an object that creates meaning – a meaning that is therefore not intrinsic to the object and cannot be

designed deterministically. A designer may conceive of potential meanings and design features and technologies that serve as a platform for which a user can provide their own interpretation. But the fact is that people will often bestow their own meanings for products that deviate widely from the original purpose (Verganti, 2009). "Humans thrive when they can realize themselves on their own terms, unfolding autonomously" (Krippendorff, 2006, p.131).

For the design of urban furniture, the concept of open-affordances not only implies freeing up possibilities and interpretations, but also advocates not precluding possibilities. Deasy (1985) explains that it is a public space designer's responsibility to create settings that promote social interaction, but perhaps more important, to avoid the creation of settings that discourage such interaction. Open-affordances proposes comprehensive urban furniture design that can more effectively facilitate enduring human-object relationships in public spaces and lead to improved scenarios for social urban activity.
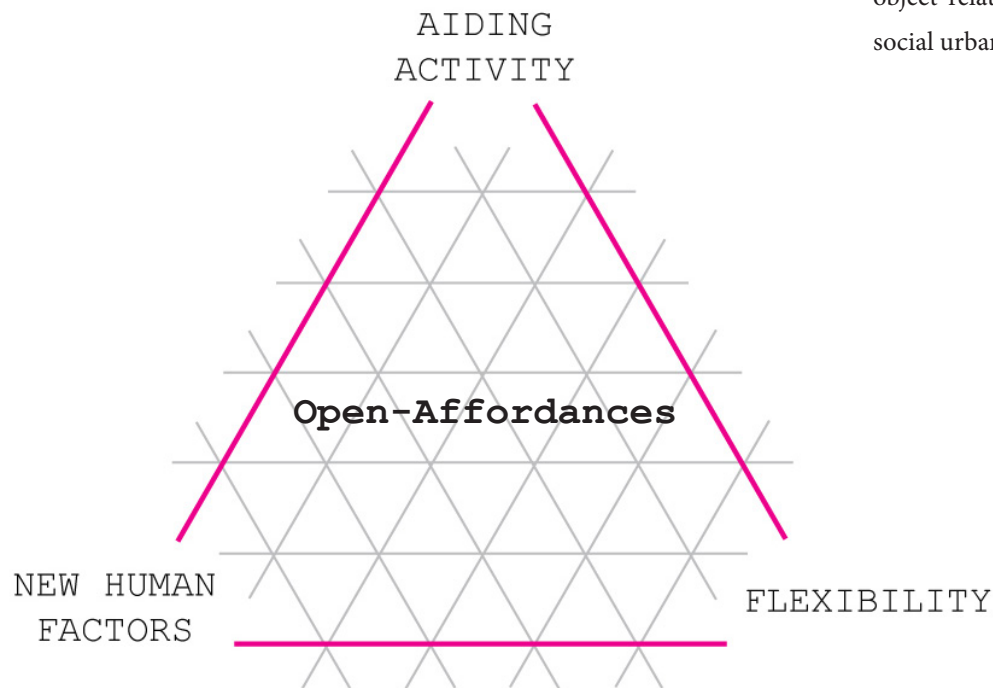

AIDING
ACTIVITY

Open-Affordances

NEW HUMAN
FACTORS

FLEXIBILITY

Figure 5.1 The proposed Open-Affordances framework for urban furniture design

5.4. The Developmental Evolution of Open-Affordances

The concept of open-affordances was developed through a human-centered design research process involving parallel methods of contextual review, passive observation, and reflective-practice. Early notions of the framework, including certain attributes of affordances, were used as a basis for design practice. Reflections from practice cycled back to inform and improve the framework development in a process that continued until the complete concept of open-affordances was fully realized.

Initially, a contextual literature review in the discipline of public design suggested that activity and social connections in public have been declining, and user-based needs and desires were often deemphasized in pubic space development. This scenario framed the need to emphasize a human-centered approach to public design in which user-needs and desires would constitute the main focus of research and subsequent design.

As observational and practice-based methods commenced, an approach to enhanced urban furniture design was developing around supporting activity. Initial observations indicated activity, or people's personal needs and related actions, as an apparently dominant motivating factor behind user-behavior. Therefore, it was considered that the aim to enhance the vitality of public spaces could be appropriately addressed through design that bolstered specific activity. This position led to the approach of explicitly designing affordances into the tangible design of urban furniture by extending the functionality of an object in order to more effectively serve people's apparent needs. Passive

participant observations provided insights in which specific need-based activities were indicated and subsequently utilized as the foundation for design. A few examples of identified activities included chatting with friends, reading and writing outside, playing games, riding bikes, waiting for the bus, etc. Although fairly common activities, it was concluded that these desirable activities could be reinforced through better public design.

However, through another string of passive public observations, a pattern of user-behavior had revealed instances in which urban furniture design was being used in ways not intended by the original design (refer to Passive Observation chapter). Additionally, reflections from early practice-based design efforts indicated that, in the effort to support a specific activity through design intervention, design outcomes may have become too prescriptive in use, therefore precluding the potential for a diversity of alternative and undetermined activities and users.

From this perspective, it was considered that a level of 'openness' and/or freedom of interpretation needed to be infused into the developing framework for urban furniture design that could more effectively support autonomous human needs and activities occurring in public spaces. The framework was termed 'open-affordacnes' – describing a triangulation of factors that can be used to inform urban furniture design that more effectively support active urban life. The standard of open-affordances is oriented toward fostering increased user-participation, social interaction, and a dynamic human experience in public spaces. The intent of proposing open-affordances in public design is to facilitate a resurgence of the valuable role that public space can play in the social and environmental health of urban living.

5.5. Three Facets of Open-Affordances

Three design facets form the basis of the open-affordances framework developed for this study: (1) Aiding Activity, (2) Flexibility, and (3) New Human Factors. These particular facets were derived and reinforced through a triangulation of context review, passive observations, and reflective design practice. Although their theoretical and practical application is explored in more detail throughout the practice-based chapters of this thesis, the remainder of this chapter presents a summary of the three facets.

Aiding Activity:

The facet of *aiding activity* refers to the capacity for a designed object to directly support the needs, actions, and efforts of users in public spaces. This implies providing design (specifically urban furniture) that can correspond gracefully and intuitively within the requirements of an underlying activity (Norman, 2005). The notion of aiding activity emphasizes user-needs and/or desirable actions foremost, whereas design plays a supporting role as a reinforcement of identified needs. This facet of open-affordances deemphasizes aesthetic design for design's sake in favor creating designs that are in balance with their functional role and dynamic context.

Aiding activity addresses a human-centered approach to design in which the proclivities of human behavior are what drive design – the focus is on people, but more importantly, what people are afforded to do. An emphasis on "verbs, not nouns" imbues the design process in human activity, leading to better ideas for improving human experiences (Suri, 2005, p.168).

Various human-centered design research methods can be utilized to explore common and/or latent need-based activities in public spaces. Passive observations were used as a primary method for this study - the results of which are explicated throughout this thesis. However, in addition to observations, a proactive approach to identifying desirable activities can be taken. This proactive approach, recommended by Manzini (2008), involves combining design activity with an agenda to support new scenarios of healthy and socially-sustainable urban living. Activities such as walking more, eating local food, socializing with neighbors, participating in community affairs, etc. are just a few examples of activities that Manzini (2008) suggested comprise an improved sustainable quality of urban living. A proactive approach such as this suggests the restructuring of value found in activity, and therefore the value placed on active public spaces.
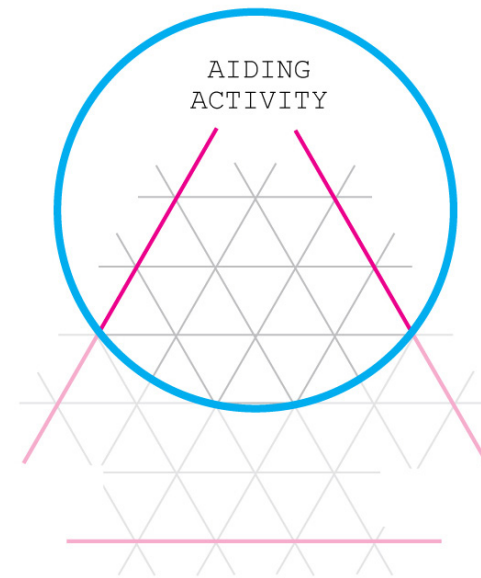

Figure 5.2 The *Aiding Activity* facet of Open-Affordances

Flexibility:

Flexibility, to a large degree, represents the *open* quality of open-affordances. For a design to be flexible means not just that the design can be physically movable and adaptable, but also could imply a user's reinterpretation of the design's function. Key observational insights from this study observed that a preference was given to functional objects in public spaces that could be used and adapted in various ways. This corresponded to Whyte's (1980) finding that if there is a choice between fixed and movable seating in public spaces, people will almost invariably choose the movable type. The act of being able move, adapt, rearrange, or reinterpret an objects function imparts a certain autonomy and ownership in public spaces that is not as easily induced by static objects of design.

Flexibility entails a dynamic quality in function – a quality that is not typically attributed to urban furniture. The aspect of flexibility suggests an increase in the dynamic interaction between humans and objects; an interaction that can invoke the ingenuity and imagination of users to create a positive and consistent relationship between people and subjects of design (Suri, 2005).

Baur (2008) explains that the discipline of design is best observed through the quality of interaction it generates: the relationship between human beings and transformed non-human objects. Designing flexibility into public space furniture can deepen the level of potential interaction, both between humans and objects, and in terms of public sociability.
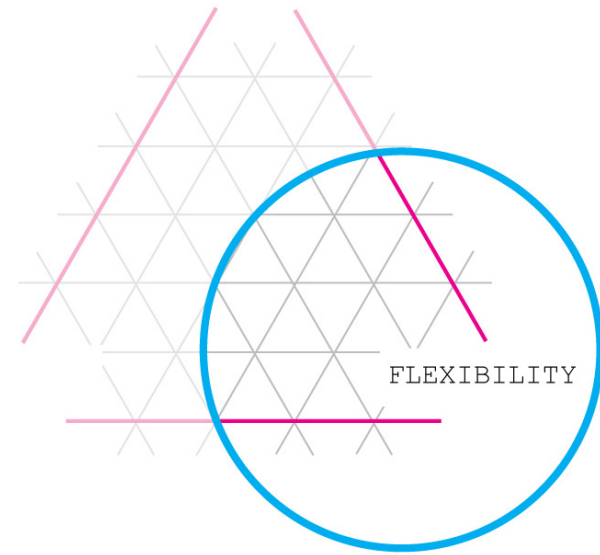

Figure 5.3 The *Flexibility* facet of Open-Affordances

New Human Factors:

The facet of *new human factors* is used in reference to Jordan's (2000) term by the same name, in which a standard understanding of human-factors is supplemented with an additional layer of human pleasure. Jordan (2000) explains that the simple usability and visual qualities of a product design, while important, are not enough to satisfy modern users. People nowadays are looking for thoughtful designs that demonstrate an understanding of their values, culture, and lifestyle. A design approach based on this understanding is what constitutes infusing pleasure into new human factors design.
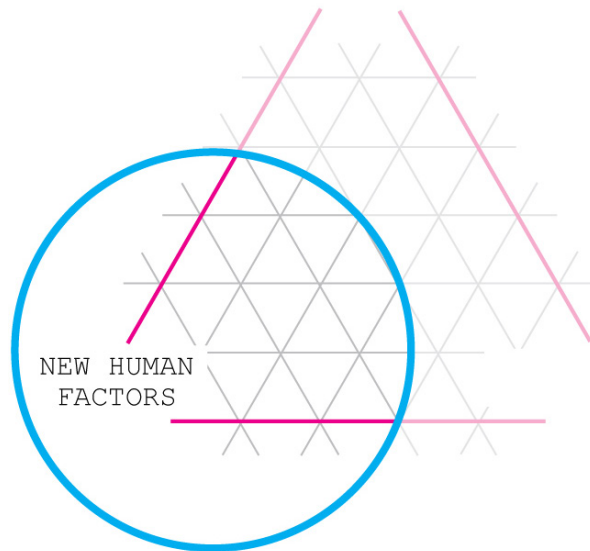
Traditional human factors, also often referred as ergonomics, remain an essential component of facilitating pleasurable, comfortable experiences for users. Defined as the development and application of knowledge about human physiology and behavior in operational environments (Nemeth, 2004), traditional human factors offer a sound basis for ensuring that aspects of usability, functionality, and human comfort are built into design. These considerations represent a foundational layer of *new human factors*.

However, an additionally critical component for design is proposed through new human factors that revolves around providing pleasure for the user. This additional layer compliments the functional benefits of a design with emotional ones (Jordan, 2000). The emotional layer makes reference to 'four pleasures' that can be infused into design. These include: physio-pleasures that appeal to the senses, socio-pleasures that support social relationships, psycho-pleasures that facilitate ease of use, and ideo-pleasures that appeal to people's morals and values (Jordan, 2000). New human factors presents a facet of open-affordances that seeks to understand people more holistically and respond to their intrinsic needs.

Figure 5.4 The *New Human Factors* facet of Open-Affordances

Open-Affordances Synthesis

In order to effectively address the intent of open-affordances, a triangulated framework of *aiding activity, new human factors, and flexibility* through design is proposed. The open-affordances conceptual framework underpins a new approach to urban furniture design in which the consideration of dynamic user-needs, represented through the three facets, is placed at the center of the design development process. With support of the open-affordances framework, inspiration is drawn through human-centered methodologies and translated into socially innovative design outcomes that bolster the positive contribution that public space can have in everyday urban life.

For the Public-Object Nexus study, the conceptual open-affordances framework was applied to the individual design projects that are outlined in the following chapters. For each project, a singular facet of open-affordances was investigated through research and responded to through design. Results and reflections from each respective project fed back to inform the final open-affordances conceptual framework that is proposed by this study.
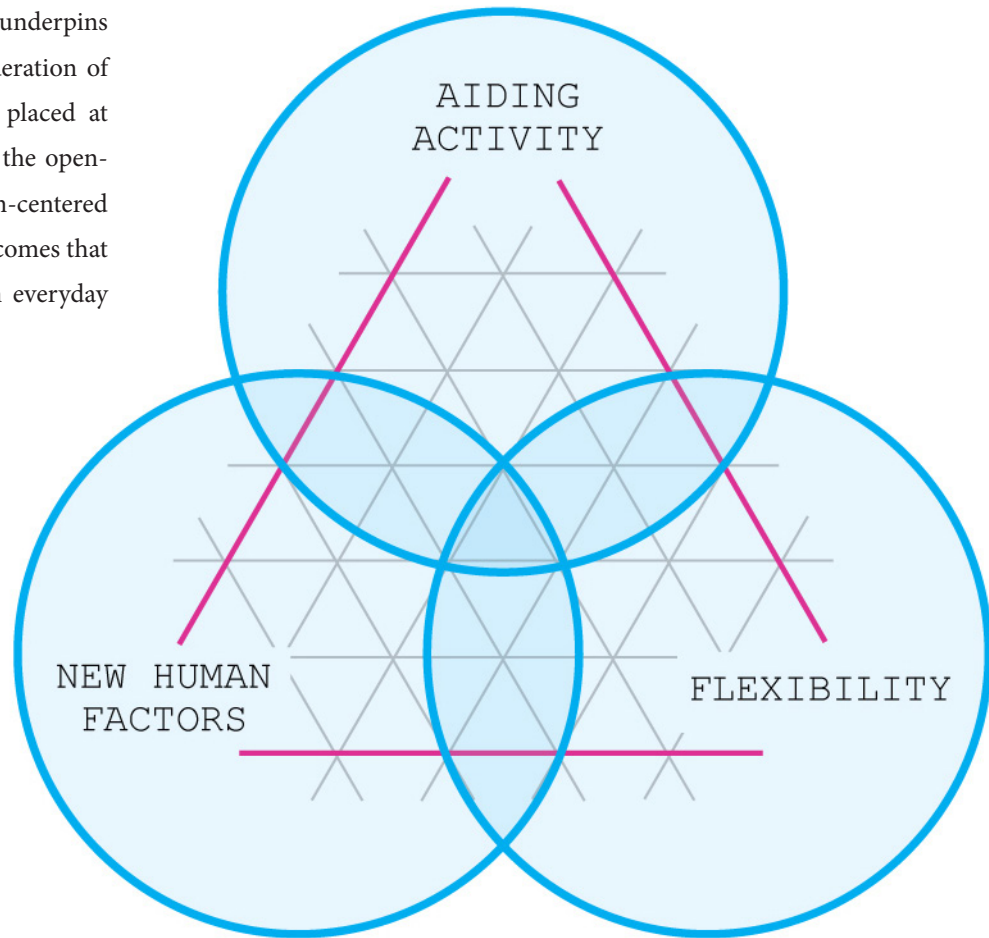

Figure 5.5 Open-Affordances Synthesis

6. *The Sugarhouse Lounge*

INTRODUCTION

The first in a series of three consecutive practice-research projects was primarily initiated to help the commencement of the practical design phase of this study. The main purpose of this first project was to help facilitate a deeper engagement with product design methods. Specifically, these included the identification of insights and development of physical form in response to these insights.

An opportunity to participate in a design challenge was presented by the Utah Transit Authority and the University of Utah (both organizations located in the researcher's home town). The stated aim of this challenge was to promote public transit readership through improvements to the physical user-interface; the bus shelter.

As a strategy toward increased vitality and environmental sustainability, PPS (2010) asserts that public transportation stations can be a catalyst for improving health and civic engagement, while servicing people's transit needs (PPS, 2010). Additionally, the APTA (2010) affirms that public transportation equals a stronger economy, a cleaner environment, and greater energy independence—which add up to a better quality of life, adding that public transportation is also critical to the social quality of life for all citizens (APTA, 2010).

OBJECTIVES

Engaging in this design challenge to re-envision the 'bus shelter' revolved around a personal objective to ignite the creative stage of this overall study.

Specific objectives were:

- To explore and challenge the design (aesthetics, form, materials) of existing urban furniture. The bus shelter brief not only offered a succinct challenge and well-defined timeframe (one bus-shelter in two weeks), but also included the potential to acquire open feedback from the project's organizers (the University of Utah, and Utah Transit Authority), as well as participants (other design entrants),

- To explore the use of human-centered design (HCD) methodology from project initiation through to concept fruition. Passive public observations and generative design processes led to a final design outcome that was used to inform subsequent design explorations and inform the evolution of the *open-affordances* framework.

OPEN-AFFORDANCES: NEW HUMAN FACTORS

The ultimate approach taken by this project was an appeal to new human factors, specifically comfort and relaxation, as a basis for developing physical design within the evolving open-affordances framework. The aspect of new human factors emphasizes a spectrum of human-centered considerations such as functionality, ergonomics, pleasure, and meaningful significance. The goal was develop an original bus shelter design that could address these specific factors, and therefore, a specific facet of open-affordances.
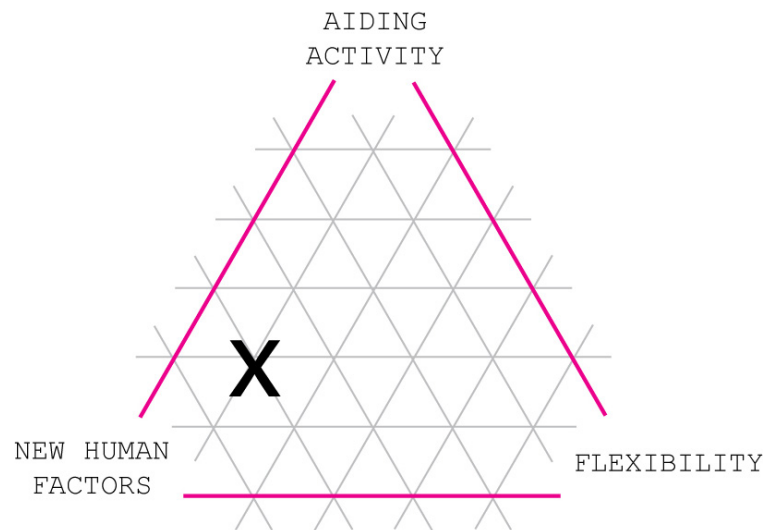

Figure 6.1 The New Human Factors facet of Open-Affordances

6.1. Research Stage

Passive Observations

To initiate a specific design research stage, the first step was a series of field visits to conduct passive observations of the bus shelters located on Symonds Street in Auckland's University district. Without preconceived notions or hypotheses about what insights might surface, observations were conducted with the purpose of identifying common behavioral patterns and idiosyncratic events regarding bus transportation users and their interaction with the physical shelters. The intention in identifying patterns and issues around general bus shelter use was based on the potential to subsequently address these issues through design in an effort to ultimately improve the human experience and success of this particular component of public transportation.

As it was not possible to conduct field observations in the design challenge's location in Salt Lake City, Utah, field observations were undertaken in Auckland City. The strategy underpinning this effort was a supposition that behavioral insights derived from scenarios observed on Symonds Street in Auckland could then translate to design principles for a shelter applicable to the design challenge in Salt Lake City.

INSIGHTS

Through a series of observation sessions focused on Symonds Street bus shelters and associated users, a recurring set of behavioral patterns quickly emerged. These patterns transcribed into the following key observational insights:

1) The majority of bus shelter users tend to watch quite attentively up the road while waiting for the bus,

2) While waiting, users are arranged in a multitude of ergonomic positions,

3) In general, unacquainted users tend not to socialize with other users.

Figure 6.2 A peak hour at a bus shelter on Symonds Street

INTERPRETATION

Although these observed behavioral patterns of bus shelter use may seem somewhat tacit or obvious, the motivation behind such behavior can be interpreted in a variety of ways; bringing to the forefront a primary question of whether observed patterns of behavior are a user's *preferred* behavior or *involuntary* behavior. Specific to this case, the driving question becomes; do people sit and watch anxiously for the bus because they *prefer* to? And, do they sit in various positions because they prefer to? Precise answers to these questions may be difficult to obtain. Because these types of behaviors often occur on unconscious levels, and asking these individuals may not yield dependable results (Suri, 2005). However, it seems that through a human-centered interpretation, an opportunity exists for designing a bus shelter in response to these behavioral insights. Is there a way to alleviate anxiousness, to allow people to relax and enjoy their bus waiting experience? And can this be achieved through the provision of physical human-scaled design?

Contextual Review

PUBLIC COMFORTS

The observational insights described above highlight the role of relaxation and comfort as behavioral qualities in and of themselves. What does it mean to relax, and particularly, to relax in public? Some have suggested that relaxation and comfort should be an inherent attribute of any public space (PPS, 2000; Carr, 1992). Yet, observations of the Symonds Street bus shelters, as an example, indicate that public provisions may not always be conducive to relaxation. Carr et al. (1992) explain that comfort is a basic need:; "The need for food, drink, shelter from the elements, or a place to rest when tired all require some degree of comfort to be satisfied" (p.92). As an important aspect of nearly any successful public space, comfortable *seating* is also deemed essential (Whyte, 1980). Some of the particularly important features of physically comfortable seating include: "orientation of the seating, its proximity to areas of access, seating for individuals and groups, seating that enables reading, eating, talking, resting, and privacy"(Carr et al., 1992, p.94)

Additionally, comfort can be understood as a psychological attribute – often in the form of familiar and/or conventional cultural settings. Carr et al. (1992) refer to the "legibility" of a design as a quality that imparts familiar, recognizable cues to convey a design's intention. For public spaces, these cues communicate what kind of a place it is, and often determine if people feel welcome or not. One aspect of comfort that can be provided through legible cues is created through visual and physical metaphors – features that make reference to other common and familiar scenarios. Suri (2005) explains that many of the habits and reactions of typical human behavior depend on socialization and cultural learning, and recognition of such cultural patterns and learned meanings can inform effective design through building on familiar interactions.

A PHYSICAL AND PSYCHOLOGICAL APPROACH

For this design project, an approach to addressing comfort in public space emerged around enhancement through both physical and psychological means. This concept developed as an intuitive response to the behavior of bus shelter users. The experience of waiting for the bus appeared to be tense and awkward, and for some individuals, the experience is long. It was the intention of the researcher to propose a design solution that would alleviate this apparent tension through a combination of improved physical and psychological comfort factors – otherwise referred to as 'new human factors.'

SURVEY OF EXISTING DESIGN

Surveying existing design for this process was undertaken in the form of an "image feed" – a method of reviewing what designs exist in the particular genre in order to assess general advantages and disadvantages, material choices, human considerations, color and dimension choices, etc.

A cursory evaluation of analogues bus shelter concepts revealed an overabundance of architectural and/or technologically centric solutions. Also, it seemed that not much true innovation existed in the realm of human factors and comfort considerations for bus shelter users. Surveying existing design at this point bolstered a positioning for physically comfortable and metaphorically gratifying bus shelter design.

6.2. Creative Stage

Brainstorming

Based on a conceptual direction for design revolving around providing physical and psychological comfort, the project effort proceeded to a generative and transformative creative stage of human-centered design. The first creative method employed in this stage was a rapid brainstorming phase. Brainstorming is a technique for generating a large amount of ideas in a short timeframe, usually focused on expanding and unpacking a specific topic.

For this particular phase, brainstorming was used to explore metaphors for human-comfort and analogous scenarios of human-scaled design in which comfort and human factors are central. The objective was to consider physical and metaphorical "cues" that conjure the 'feeling' of comfort at the scale of a bus-shelter sized environment.

The outcome of this rapid brainstorming phase was the evolution of four alternative design metaphors. These alternatives appealed to comfort and western cultural metaphors through reference to familiar leisure alternatives and/or artifacts that imply comfortable cultural autonomy. These included:

A) The Living Room - Sometimes also referred to as a lounge, this concept makes reference to the typical suburban household living room,

B) One large object - A reference to the stereotypical suburban household sofa, but as an abstraction, making it playful and adaptable for different sitting arrangements,

C) The Swivel Loungers - A concept inspired by barber-shop chairs. Ergonomically built for extended comfort and extensive adjustability. Swiveling allows the user to easily watch for the bus,

D) The Poolside - The ultimate leisure activity – lying by the pool. Users are virtually forced to relax in this setting.
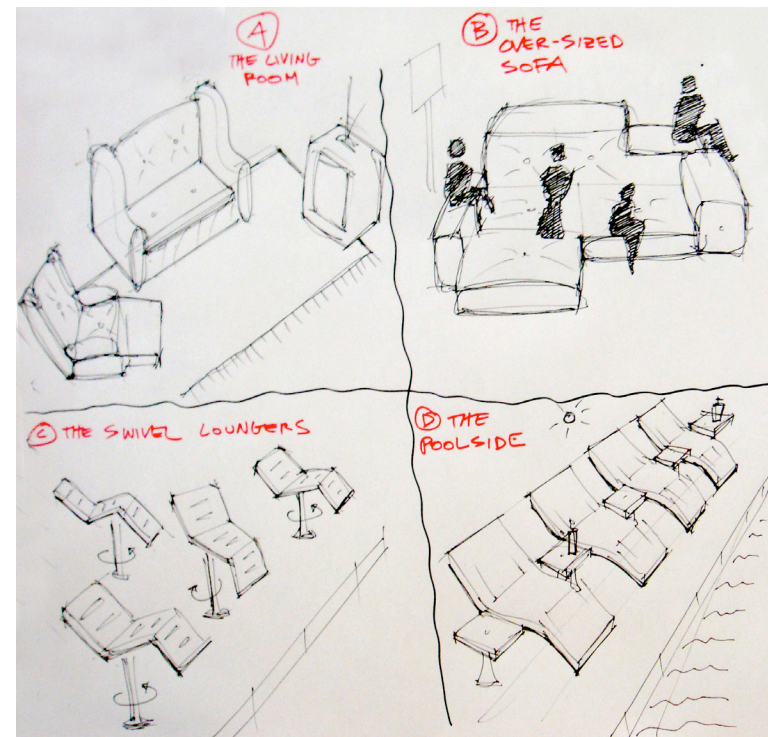

Figure 6.3 Alternatives derived through brainstorming

The appropriateness of concept alternatives was assessed through an intuitive approach based on which concepts the researcher believed would be most salient. The intention of brainstorming at this stage was to expand metaphorical possibilities that could transcribe to an original, yet culturally familiar, bus shelter design - a concept that holds the potential for wide-ranging cultural association, and also a large potential for dynamic product integration.

Ultimately, the 'living room' concept alternative materialized as the direction that the researcher and colleagues determined was best suited to achieving physical and psychological comfort through a design metaphor. The following concept synthesis describes the combination of ideas and insights that congealed to constitute the final bus shelter design concept.
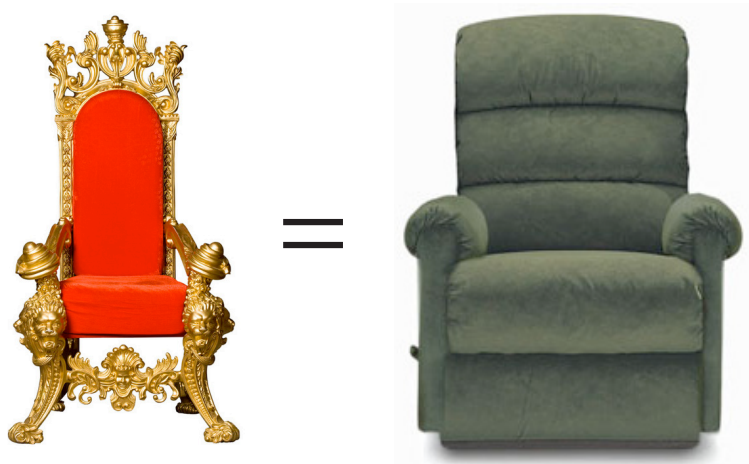

Figure 6.4 The armchair as the Mid-West American throne

Concept Synthesis

Summarized in this section is the convergence of ideas, research interpretations, and metaphorical concepts that formed the final design direction for the 'living room' bus shelter concept.

1)   **An interpretation of the behavioral patterns of observed bus shelter users:** User behavior indicated waiting for the bus was a somewhat inhospitable experience in which users were compelled to keep constant watch for the bus. An appropriate design intervention might enable users to relax and enjoy the waiting experience more readily.

2)   **The armchair as a metaphorical 'throne':** a spontaneous metaphor that would come to underpin the 'living room' was the idea of the 'throne.' The official seat of a monarch, the throne implies a gesture of imbedded importance and pride for those who sit upon it. Waiting for the bus should impart a similar experience of regality, class, and pride. In the American mid-west, the living room 'armchair' is widely considered analogous to the throne.

3)   **A call for enhanced comfort afforded by public spaces:** Design practitioners and theorists in both urban design and product design fields state the importance of comfort and human factors in creating comfortable public spaces, yet the standard typology of bus shelters does not typically offer extensive physical and/or physiological comfort.

4)   **The retail furniture heritage of the Sugarhouse neighborhood context:** The "living room" concept also worked well as a cross-reference to the historic context of the Salt Lake City neighborhood in which it would be ultimately proposed. The 'Sugarhouse' neighborhood was once known as "Furniture Row" based on its retail furniture-based economy.

This collection of developmental components comprised a concept synthesis revolving related the "living room." The final concept was determined to offer an abundance of innovative opportunities for urban furniture design and a sound foundation for establishing metaphorical cues for pleasure and comfort. The challenge from this point was in maintaining a succinct formal design that accurately represented the synthesis of ideas.
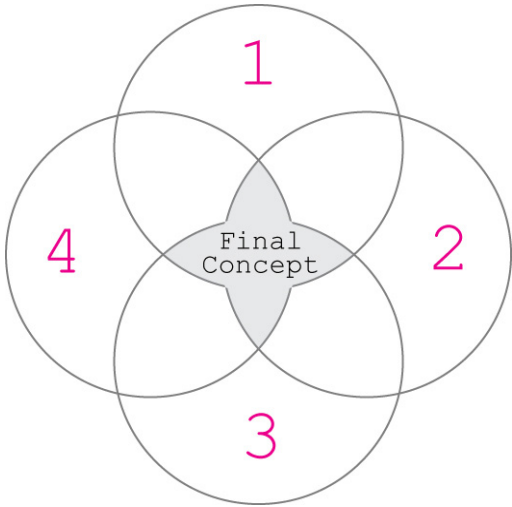

Figure 6.5 Concept synthesis for a final bus shelter concept

CRITICAL SUCCESS FACTORS

The following is a list of criteria that were established to guide final concept design development:

Intent	• Challenging the notion what a bus shelter can provide • Instilling physical and psychological comfort • Imparting novelty, playfulness, and humor
New Human Factors	• Protection from weather / the elements • Places to sit / lean in comfortable proximity to others • A sense of enclosure and comfort • Visibility of street activity and incoming buses
Aiding Activity	• Enjoyable waiting with the aid of furniture affordances • Potential for inspiring social interaction
Flexibility	• Flexibility in component arrangement
Visual Appeal	• Culturally familiar / referential to a pleasurable lifestyle • Fun and playful forms, unconventional for the outdoors
Functional Considerations	• User safety • Easy to maintain / repair / replace • Provision of amenities (next bus info, lighting, etc.)
Proposed Materials	• Durability against the outdoors and vandalism • Contemporary, elegant, and sturdy
Users & Context	• Equal accessibility for a variety of users • Location-appropriate – appeal to specific conditions

Ideation

In order to develop the physical properties of the 'living room' bus shelter concept, a series of iterative designing techniques were employed as a means toward concept refinement. These techniques, referred to as ideation, were used to specifically explore aspects of form, material, and structural variation.

SKETCHING

A concept-sketching phase was undertaken with the primary objective of investigating iconic forms for both the bus shelter architecturally, and for the human-scaled furniture products within. Explorations included variations of archetypal living room furniture translated for outdoor use, combinations of familiar and new forms, testing of various architectural shells, color experiments, and a search for a distinctive, iconic roof form. The 'armchair' seat remained a central organizing component, and other components such as the structural shell and alternative seating were envisioned to complement the 'armchair' as an icon.
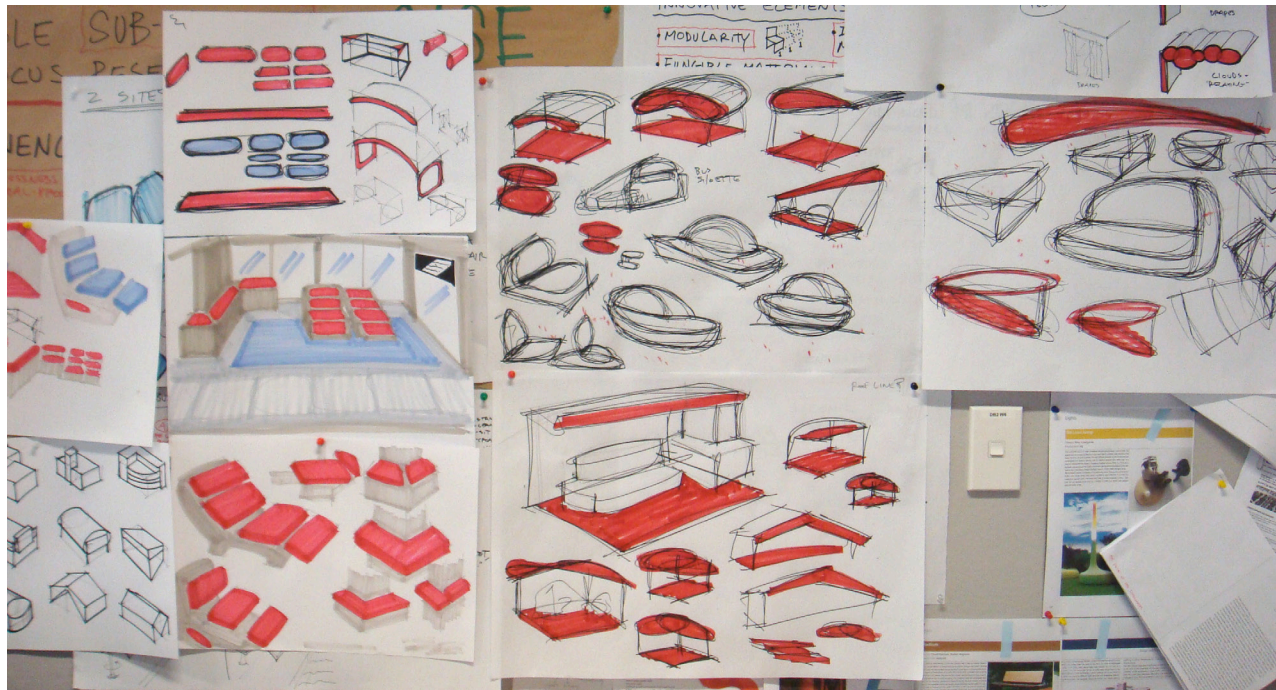

Figure 6.6 Ideation sketches for the bus shelter concept

MODEL MAKING

As a second phase of concept ideation and refinement, scale models were used to create and analyze potential forms and scale proportions for the bus shelter's design elements. Much of the focus in this stage revolved around investigating the armchair as the central organizing piece of the set. It was expected that once the formal details of the chair were established, the rest of the shelter's design would follow in style, color, and material.

Through this process, it became clear that the "set" of pieces, or "sum of parts," was what gave the concept salience. Therefore, the "set" was expanded to include an outdoor house lamp, a coat rack, and eventually, a standard picture frame to display bus route information.

Figure 6.7 Scale model explorations of various furniture forms

The primary outcome of this phase was a final determination by the researcher and colleagues that the 'living room' concept needed to be clear and obvious, and that design components needed to succinctly reflect the compositional framework of an actual living room. This clarity would render the design better equipped to achieve its stated intent. Based on this determination, a set of final revisions were made to elucidate the 'living room' concept as a clear means toward physical and psychological comfort.

6.3. Communication Stage

Delivery

Delivery refers to final concept deliverables. In the practice of design, deliverables (often in the form of renderings and/or prototypes) are essential for communicating design outcomes to stakeholders, decision makers, and collaborators who will later contribute to the design's construction and manufacture.

Concept communication deliverables for this project resulted in the form of representative illustrations and photorealistic renderings. The purpose of these deliverables was primarily to communicate the concept and its potential application.

Figure 6.8 A rendering of the final bus shelter design in an urban context

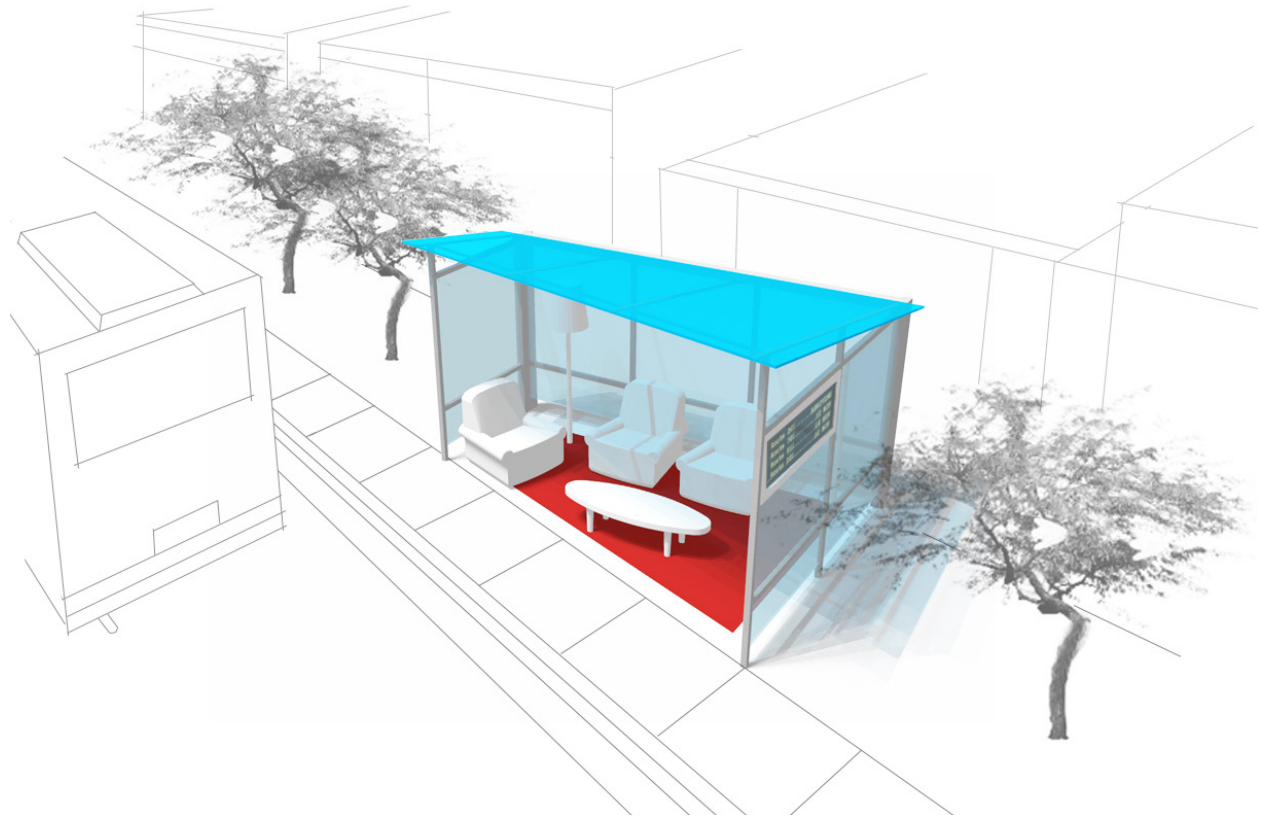## FINAL CONCEPT | THE SUGARHOUSE LOUNGE

Introducing the Sugarhouse Lounge – a bus shelter developed in reference to the familiar components of a living room. The individual seat, as the main feature, is a proportionally scaled-down and simplified version the typical living room armchair - comfortable, yet minimal, and slightly abstracted with its shrunken arms. Contained in an architecturally simple glass enclosure, the row of armchairs are flanked by an outdoor lamp and coat rack, and punctuated by a dark red stone floorplane. The bus shelter structure is slightly offset in an axial orientation that facilitates watching up road for the bus.
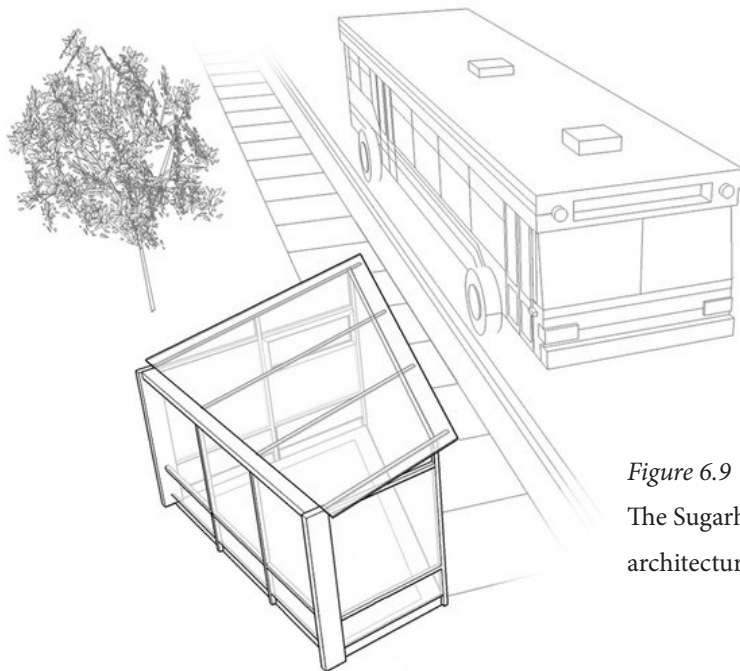
Figure 6.9

The Sugarhouse Lounge

architecture and orientation
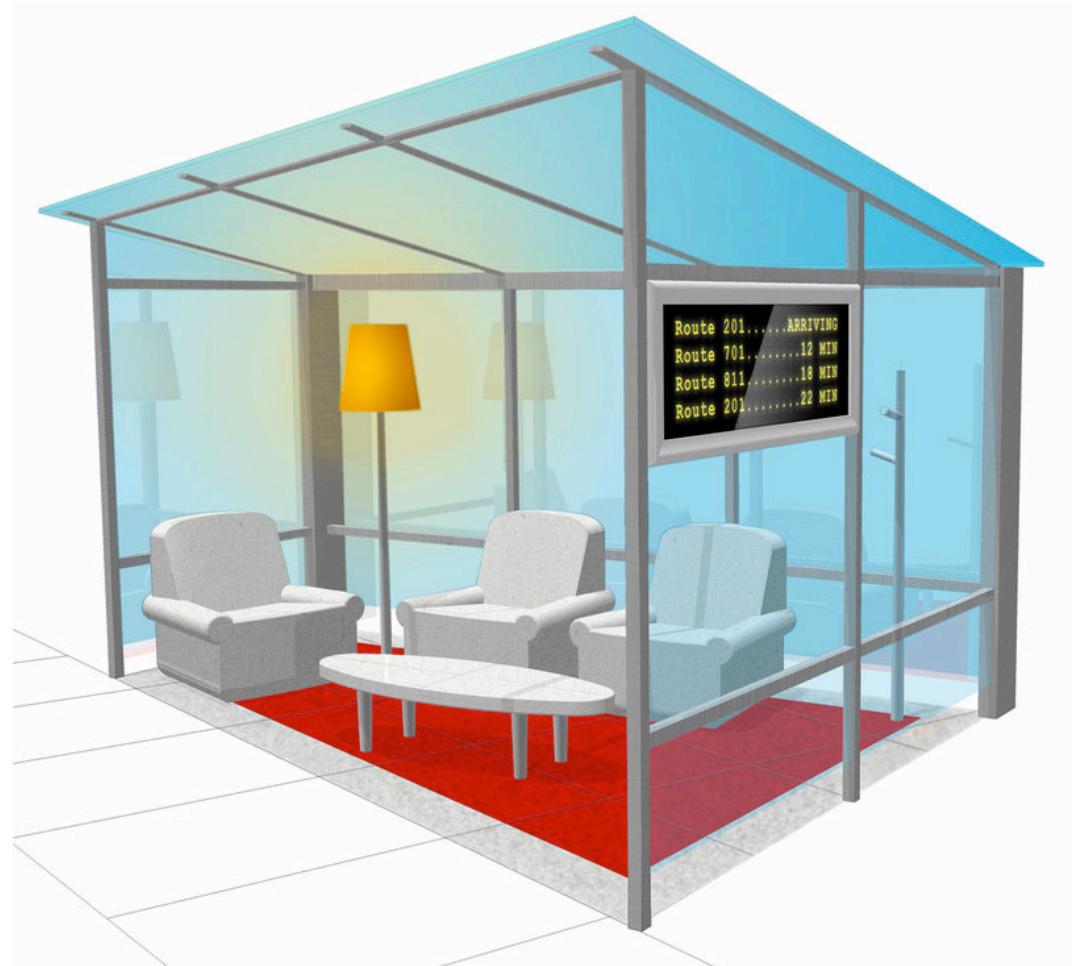
Figure 6.10

A rendering of the

Sugarhouse Lounge at dusk

PROPOSED MATERIALS

The driving principle behind proposed material selection centered on durability with a sense of delicacy. Specific material applications are proposed below:

• The Armchairs: Precast white concrete,

• The Coffee Table: A pre-cast concrete slab on gently tapered stainless steel legs,

• The Lamp: A plastic molded polyetheline conical head, and stainless steel tapered base,

• The Coat rack: A solid, tapered, stainless steel piece with welded arms,

• The Notice board: A framed digital information display,

• The Shell: Simple glass and aluminum construction components.

Figure 6.11 Close-up view of the Lounge furniture in use

Figure 6.12 The Lounge superimposed on Symonds Street, Auckland, NZ

Figure 6.13 The armchair and house lamp forms

Evaluation

As the first design exploration is a series of practice-based design projects, a formal evaluation of this particular project was not attained. Although, participation in the bus shelter design challenge did offer a level of informal feedback that was encouraging in terms of the design's conceptual viability.
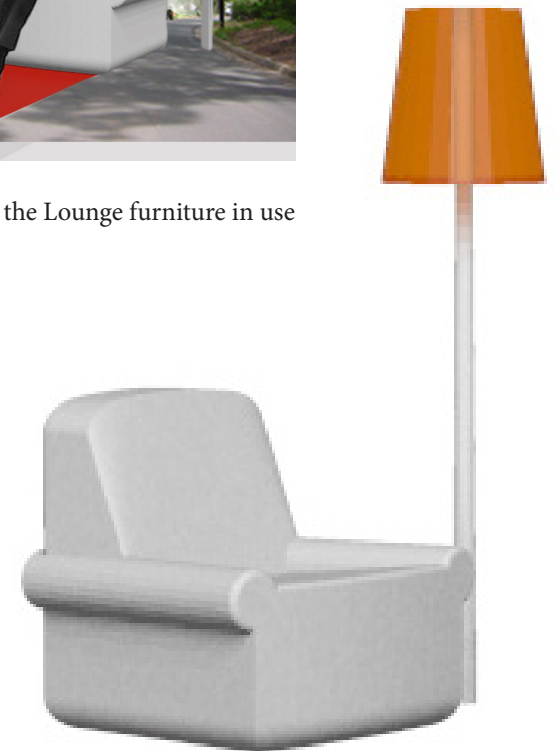
DESIGN CHALLENGE RESULTS

A select number of images were uploaded to the Utah Transit Authority design challenge website. There was no limit or prerequisite as to whom could enter the competition. Concepts were uploaded and then voted upon by anyone who cared to participate. This approach appealed the challenge organizer's overarching objective to create a community of public participation in which constructive feedback and discourse is encouraged around proposals for public intervention.

The primary objective for entering the Sugarhouse Lounge in the design challenge was the potential to generate feedback and evaluation concerning the design from the challenge's organizers as well as from fellow participants. Ultimately, the Sugarhouse Lounge was chosen as the design challenge winner, and the comments below represent a summary.

- The design's reference to the historical context of the neighborhood was praised.
- The playful nature of the bus shelter had potential to make the public transportation experience fun and enjoyable.
- The design was unique and could be a "fun and comfortable resting point in an otherwise boring process."
- The layout and feel of the shelter and furniture pieces could encourage conversation, social interaction, and interpersonal relationships.
- The design could support a sense of community around public transport removing the "social stigma of taking the bus thereby dramatically encouraging uptake and more widespread use."

NEXT STEPS

A cursory amount of design resolution was necessary to elucidate the concept, but the design process did not incorporate product testing and a proper evaluation. A significant amount of full-scale prototyping, ergonomic testing, material testing, and budget assessment would be among the myriad of further development processes needed to bring this concept to fruition.

Personal Reflections

- **A design response to human-centered observational research can require an intuitive leap of interpretation and agenda driven response:** Investigating human-object relationships and identifying behavioral patterns did not necessarily frame a perfectly clear and precise design opportunity. A substantial and somewhat agenda driven interpretation of desirable behavior had to fill the gap between observed behavior and desired behavior.

- **Referencing a familiar cultural metaphor can facilitate the acceptance and adoption of design:** Through informal assessments, the majority of individuals who were exposed to the Sugarhouse Lounge concept were immediately able to understand and gauge its value and ingenuity, and most responded favorably to the proposal. The very clear use of the 'living room' metaphor seemed to facilitate this response. In contrast, other less-familiar and seemingly more foreign designs developed in the later stages of this study were more readily met with misunderstanding and skepticism.

- **Incorporating 'New Human Factors' into public infrastructure can elevate the human experiential factor thereby enhancing use:** Appealing to the combination of physical and psychological human-factors can add a level of value to public design and infrastructure that does not typically exist. The added-value can facilitate increased use.

- **In concept design, practical budget constraints are less considered, positively encouraging originality while possibly hindering implementation:** A conceptual/hypothetical design concept such as the Sugarhouse Lounge may be favorable in theory, but risks inefficiency in material use and budget consideration. A design such as the Lounge would probably be best suited as an 'accent,' or distinct 'node' within the larger system of utilitarian transportation infrastructure.

7. The Hub on the Harbour

INTRODUCTION

The impetus for this second design project was based on a general convergence of parallel design research efforts that were indicating the significance of *supporting activity* through public product design. A key observational insight that emerged from initial public space observations suggested that the *activities* people engage in are a prime motivating force behind apparent behavior. Therefore, it was the intention of this project to first identify an activity / user-need that could be better supported within a public space, and then implement a design process to bolster said user-need. This process correlated with Suri's (2005) assertion that designing for "verbs not nouns" will garner more significant results in terms of inspiring positive behavioral change. Through this approach, an initial phase of inquiry rested on the question of *what user-activity should be supported.*

> "We start with social innovation and propose products and services to effectively enable its realization." (Manzini, 2008, p.21)

Underpinning this approach to design was a reference to Manzini's (2008) promotion of "enabling solutions"- providing the tools through design that enable and empower people to participate in a healthy and sustainable lifestyle. An approach such as this suggest the initiation of a design process that begins with a proposed lifestyle improvement, or "social innovation," and a design outcome that is measured against achieving such a social innovation. Enabling solutions are characterized by the discovery of desirable social scenarios that already transpire in small amounts and are worthy of propagation through design effort (Manzini, 2008). Social innovation becomes the design framework to which decisions can defer to and be measured against.

The philosophy of Manzini's (2008) 'enabling solutions' illuminates, in contrast, the *preventative* state of much of the design that currently exists in public spaces. An apparent intention of much urban furniture design seems surreptitiously preventative or disabling in nature; extra arms on benches prevent sleeping, spikes on ledges prevent skateboarding, and signage constantly reaffirms what is expressly prohibited in public spaces. Public design intentions often seem to express a general distrust of the public, and design provisions reflect and fortify this distrust. Whyte (1980) determined through his studies of urban public spaces that places designed with distrust often get what they were looking for (Whyte, 1980). Evidentially, the effort to prevent undesirable activities in public spaces has the affect preventing desirable ones as well, as "The way people use a place mirrors expectations" (Whyte, 1980, p.63). In response, an intentionality of purpose and function through design should be pursued with an emphasis placed on desirable activities, not the opposite.

OBJECTIVES

The objectives of this design phase were to:

- Select a desirable public activity - informed by insights from field observations - and propose a design intervention that could reinforce said activity in analogous public contexts.,

- Undertake a human-centered design methodology through methods of research, ideation, ergonomic testing, and computer-aided design (CAD) development,

- Generate photorealistic computer renderings (CAD and Photoshop) of final concepts to serve as a communication tool for acquiring expert evaluations,

- Identify the issues that surround an attempt to programmatically support/ enable specific activities through built product design.

OPEN-AFFORDANCES: AIDING ACTIVITY

The opportunity for this design project involved a proactive approach - supporting a particular activity that may have not been supported previously, but where a need was recognized through human-centered research. The purpose was to explore how urban furniture might aid in an identified activity related to a healthy and sustainable lifestyle. In doing so, the *aiding activity* facet of the open-affordances framework was addressed.
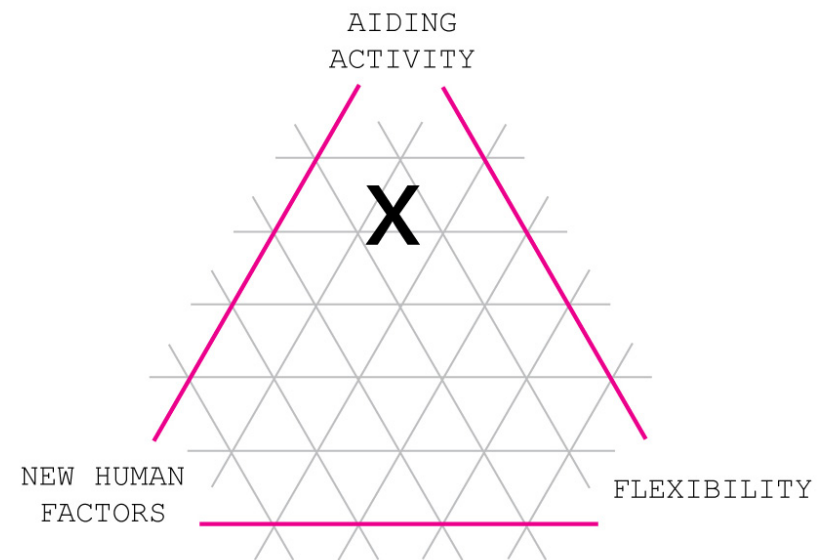

Figure 7.1 Emphasizing the *Aiding Activity* facet of Open-Affordances

INITIAL DIRECTION

At this particular juncture in the Public-Object Nexus study, participant observations, bolstered by a proactive human-centered design philosophy, had lead to an array of imagined design opportunities related to supporting healthy and sustainable public activity.

From this collection of potential opportunities (*Figure 7.2*), a direction was chosen based on a combination of ideas around doing office-type work outside (option 6) in alterative ergonomic positions (option 5). The researcher and colleagues deemed this combination as fertile territory where the potential for developing innovative and original design was not only evident, but also expressly grounded by the observational accounts described in the next section.
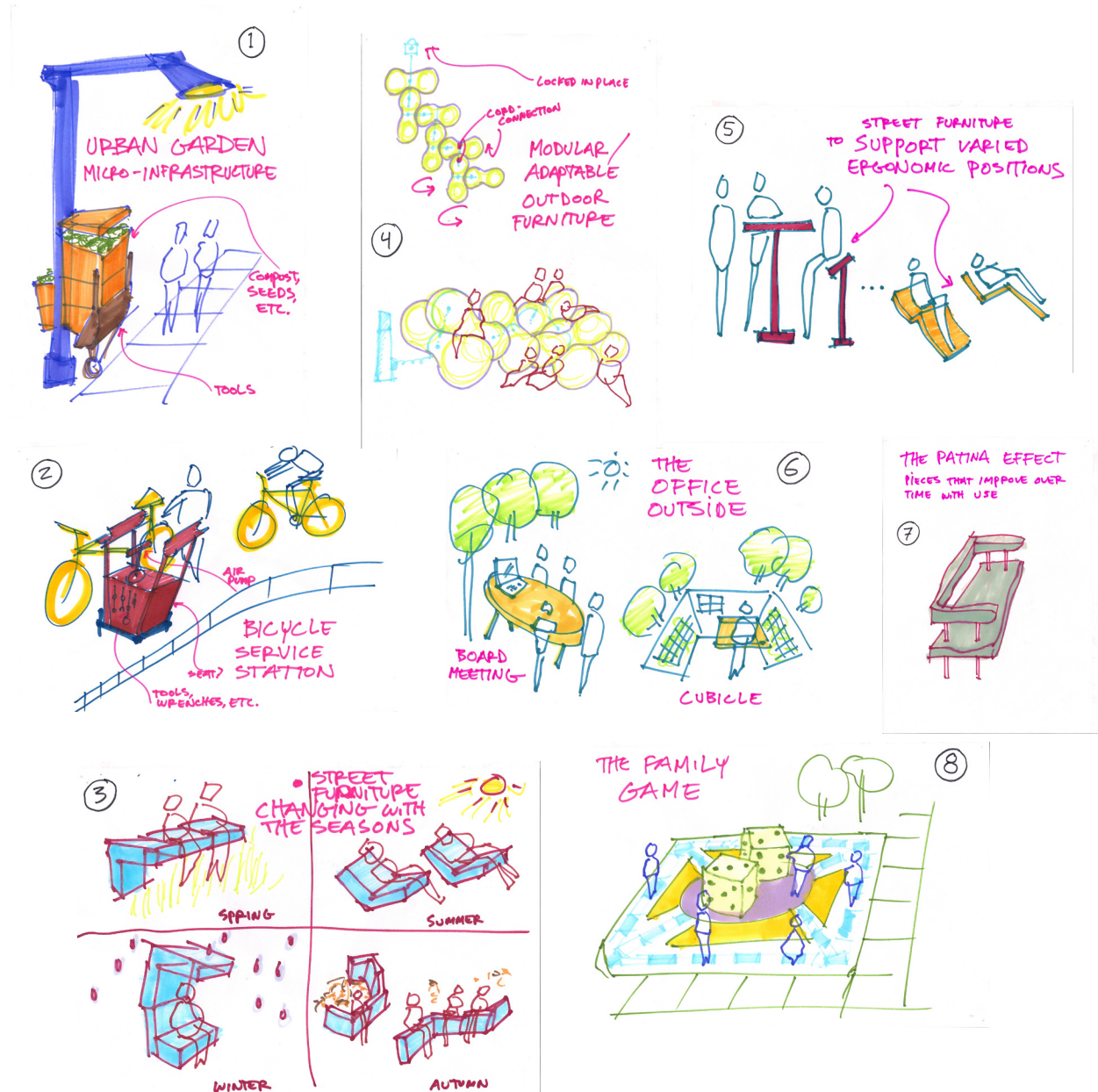

Figure 7.2 Eight initial design direction concept sketches

7.1. Research Stage

Passive Observations

Due to the situational context of the observation areas within the Auckland CBD, a large portion of the observed demographic were apparently office workers, retail attendants, and other white-collar types of users. A result was that much of the behavior observed reflected the proclivities of those who work a standard work-day (9:00-5:00). In general, the majority of individuals (particularly in the Freyburg and Britomart plazas) were observed using public space for 'break' purposes – as a temporary leave from work duties. Yet, a notable group of users were also observed using public space for business related purposes. This activity was especially apparent in the Britomart Plaza.

On a number of occasions, observations were made of what appeared to be business transactions and/or short meetings taking place within the boundaries of the plaza space. On some occasions, these meetings involved urban furniture use, yet the temporary nature of these encounters often left individuals standing through the duration of the interaction. Figure 7.3 demonstrates a prime example of this type of instance where an apparent business/work-related meeting took place on the edge of a public planter in Britomart.

INSIGHTS

Based on these periodic instances of standing outdoor meetings and work sessions, the following observational insights were derived to inform an ensuing design process:

(1) Work related activity periodically transpires in public spaces,

(2) This work related activity is often temporary in nature and performed while standing,

(3) Preferential use is related to objects that hold the least potential to stain and/or blemish a user's work attire,

(4) Public spaces tend to lack the provision of working surfaces (i.e. tables) to support such activity.

Figure 7.3 A group of users at the Britomart Plaza engaged in a meeting around a planter

INTERPRETATION

These insights suggested that people will and do visit public spaces to engage in productive, and often unexpected, occupational activity. However, this activity is an idiosyncratic pattern, not the standard, and therefore only an indication of potential behavior. In addressing these insights and asserting that the opportunity for people to actively engage in office related work in public is desirable, a number of basic inquires drove design research such as; what are the provisions needed to help people spend more of their office day outside? What are the key factors, such as physical and visual cues, that attract people to the public outdoors? And finally, what do public spaces specifically offer that isn't offered by the private realm?

Contextual Review

THE PUBLIC VALUE PROPOSITION

In an attempt to promote activity in public spaces through design, it is perhaps pertinent to build off of the inherent and unique value that public space offers in contrast to private life. Some urban theorists suggest that the 'elements,' i.e. weather and nature, are at the forefront of a public space's value proposition. Being outside, exposed to the elements and environmental features, is something public space offers – and something neglected and/or missed by those who habitually spend most of the day indoors. "People's attraction to natural features supports a public life" (Carr et al., 1992, p.41). Natural features, described as the vegetation, gardens, streams, and waterfronts that exist in and around cities, are highly valued parts of a city that serve as an attractor of all species – humans and other. This natural human attraction or affinity for nature, sometimes referred to as biophilia, is based on the intrinsic interdependence between humans and other living systems (Farr, 2008). Exposure to natural features and the elements can be a driving motivation in getting people to spend time in the public outdoors.

SEDENTARY LIFESTYLE

Additionally, the effect of not going outside – of sitting for prolonged periods of time has been identified as a major issue for modern living.

Affluent populations have become increasingly sedentary, with many adults spending 70% of more of their waking hours sitting. Parallel with this change, evidence has emerged identifying habitual sedentary behavior (prolonged sitting) as a novel risk factor for cardiometabolic

disease [causing mortality]. (Owen & Sparling, 2010, p.1140)

Owen and Sparling (2010) explain that in order to sustain musculoskeletal and metabolic health, prolonged sitting must be interrupted by intermittent neuromuscular stimulation through standing and light activity. Stated frankly, "[patients] need to get out of their chairs more frequently, both at work and at home" (Owen & Sparling, 2010, p.1140).

SURVEY OF EXISTING DESIGN

A cursory design survey revealed that in terms of doing office related work outside, very little was found to exist within the urban furniture genre that expressly supports outdoor working. Table and chair sets do exist in public, but are commonly proprietary to a food and beverage operation. The most widely accepted form of public 'surface' for activity is probably the picnic table, a furniture typology that tends to exist mostly in park settings where family outings and food related activities are intended. Not many truly public tables exist in the type of urban plazas and public spaces that were the subject of this study. Yet, the table can be considered a prime enabler for 'doing things.' The scarcity of public tables indicates the limited notion of functional possibilities envisioned by those who design and administer public space.

Additionally, an internet search for a 'standing work station' revealed a small number of product options. Although not many were meant for the public, indications of appropriate ergonomics from these products were helpful in design development.

7.2. Creative Stage

Brainstorming

The creative stage for this project began with a series of brainstorming sessions meant to unpack notions of 'working' – specifically office work, and how 'work' might be supported in public outdoor conditions. Additionally, the issue of alternative ergonomic positions *for* working was explored. The objective of this brainstorming phase was to expand ideas around public productivity and upright activity in public spaces, with an expected outcome of uncovering new design ideas.

OFFICE ARCHETYPES

Using the subject of stereotypical office archetypes, a visual brainstorming exercise was conducted to recollect typical office scenarios. The intent of the exercise was to illuminate the varied office routines and human-object interactions that could then serve as a cue for a design intervention. Scenarios depicted through this exercise were primarily derived through researcher's prior experience in differing office environments.

A particular benefit of this brainstorm was the elucidation of a the plethora of human-object scenarios that exist in office settings. "The water cooler," the "board-room table," and the "after-hours pub" were among some of the identified scenarios that could inform the design of an urban furniture work-station. Within the brainstorm, scenarios that supported more socially-oriented activity were found to be the most promising references for design in alignment with this project's objectives.
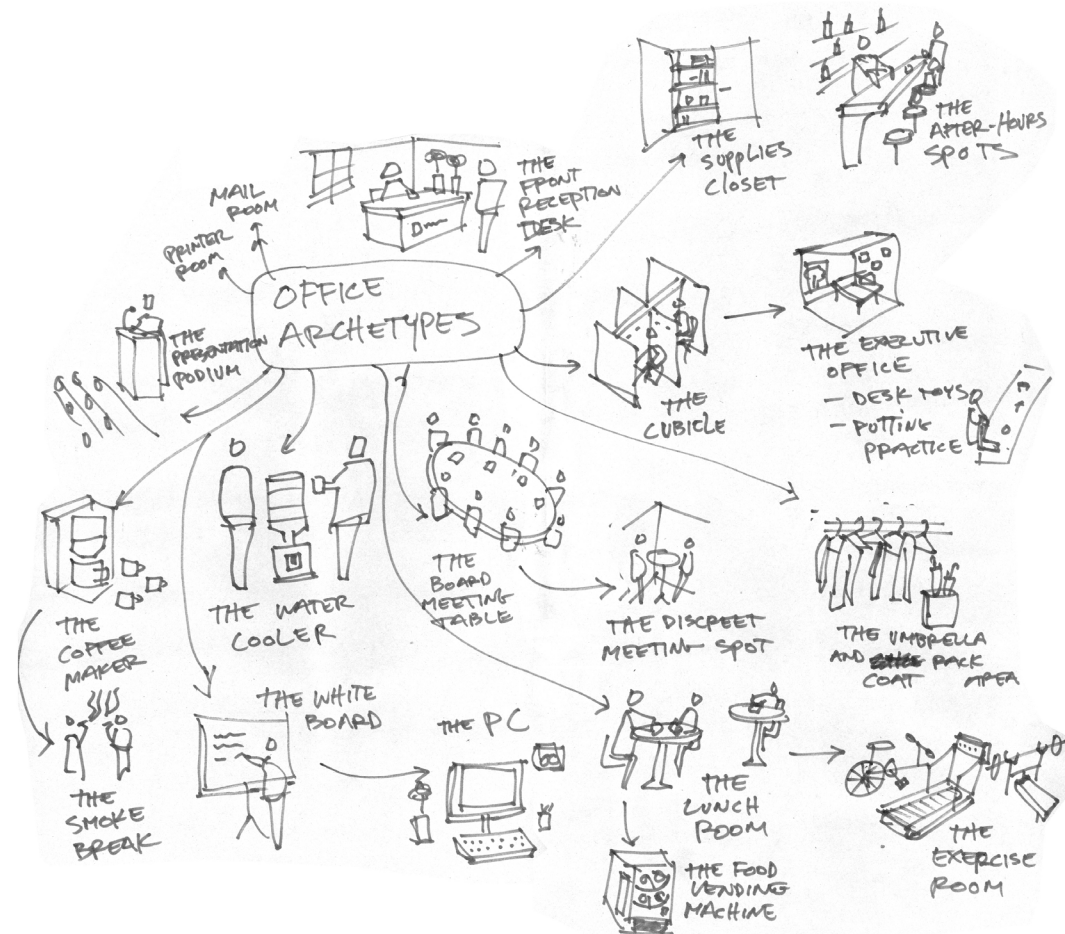

Figure 7.4 A brainstorm mind map of typical office-product scenarios

UPRIGHT ERGONOMICS

Based on an objective to provide design for upright ergonomics, an intuitive and freeform brainstorming process was undertaken through visual depictions and physical reenactments of potential ergonomic positions.

Figure 7.5 depicts a rough-sketch brainstorm exploring potential forms and positioning of urban furniture arrangements that could bear the weight of a user. References were conjured from analogus situations where standing and leaning with the aid of environmental and/or product design occurs, such as a subway train, a pub, of a bus station.
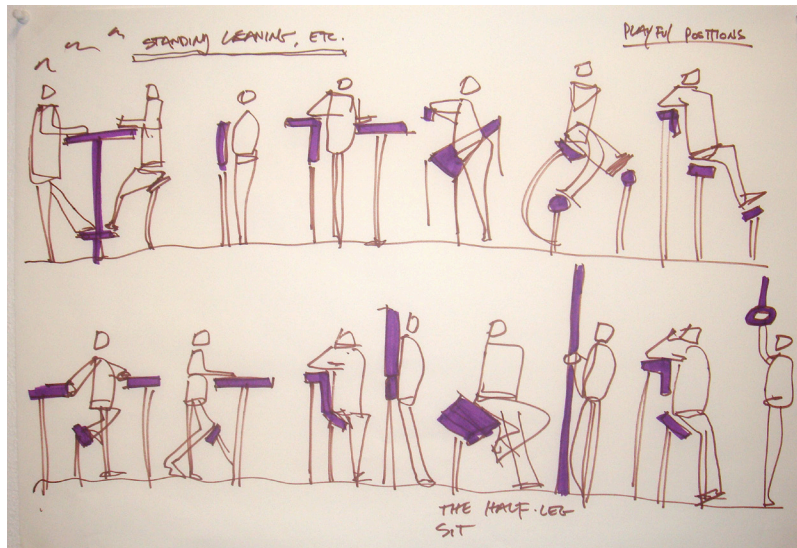
Figure 7.6 demonstrates a documented field visit conducted for the purpose of discovering and testing real instances of built design in urban environments that afford standing and leaning. Photographs show an array of possible physical interaction with objects in the field – some intended by the original design, some not. This exercise helped inform factors of proportion, material application, and spatial context for the final design.

A major outcome of these ergonomic brainstorms was the cross-referenced determination that simplicity in form would be key. Sketching exercises tend to lead the creative process down a path of 'over-design' of unnecessarily complicated form. Yet, field-testing suggested that simplicity in form might enable increased variability in potential user-interaction.
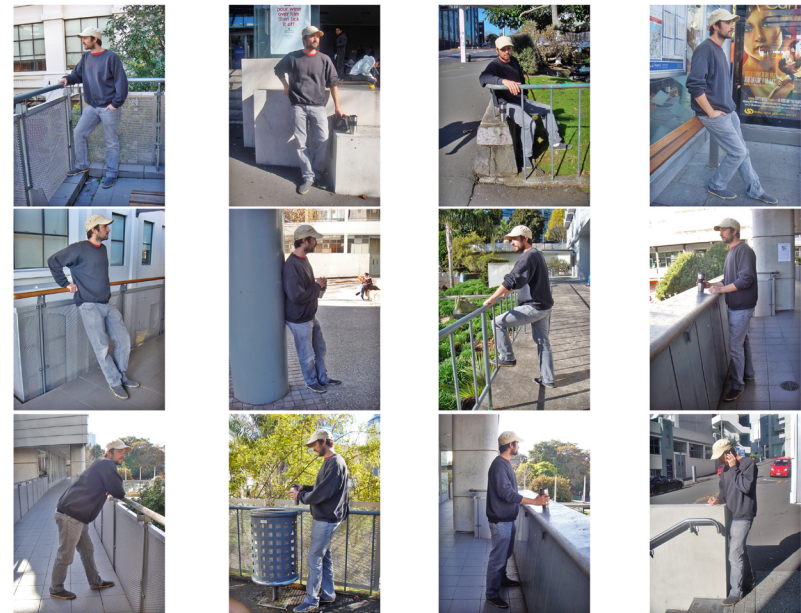

Figure 7.5 Sketch brainstorm of potential standing and leaning positions aided with environmental product design

Figure 7.6 Photographs of ergonomic field testing with built environments

Concept Synthesis

With an emergence of overlapping ideas and concepts derived through research and creative stages, an intuitive concept synthesis was identified, laying the foundation for final concept direction. This intersection of concepts and ideas involved insights from observational research, generative brainstorming, and the project's initiative to provide 'enabling solutions' for aiding productive activity in public spaces. The following is a summary of the concepts that comprised a synthesis final design:

- **Episodic work-related activity in public:** An observed pattern of outdoor meetings and other periodic work related activity in public spaces,

- **Engagement in ergonomic alternatives:** Participant observations revealed an intermittent user-propensity for positioning themselves in unconventional ergonomic positions, perhaps as an unconscious behavioral response to a predominantly sedentary lifestyle,

- **The table as an active work surface:** Tables and/or surfaces to 'work' on were identified as generally absent for urban spaces such as those observed in this study. Yet, the 'table' as a typology in the furniture genre implies the facilitation of activity,

- **The context of the urban outdoors**: Exposure to the public outdoors – weather, natural features, public social life – factors that make public

space unique compared to private space,

- **The omnipresent hand-railing:** An intuitive leap to a potential subject for design intervention - based on a recognition of the ubiquitous hand-railing lining the entire length the Viaduct Harbor. The hand-railing is a design typology that already supports leaning and upright ergonomics, and holds enormous potential for added-value through human-centered multi-functionality (*Figure 7.7*).

The emergence of the omnipresent hand-railing as a subject for design intervention became a key driver underlying the final concept direction. Select locations along the Viaduct Harbour where hand-railings existed seemed appropriate for such an intervention, in consideration of the abundance of office complexes situated adjacent to key points in the Viaduct. With the establishment of the hand-railing at the center of a synthesis of concepts, critical success factors were established to guide creative ideation and concept refinement.

Figure 7.7 The Viaduct Harbour Hand-Railing

CRITICAL SUCCESS FACTORS

The following is a list of criteria that were established to guide design development:

Intent	• Enhance public space through increased user activity • Enable people to enjoy the outdoors
Aiding Activity	• Support of temporary outdoor work as an alternative to 'the office' • Provision of work surfaces
Flexibility	• Flexibility in installation options • Modular components allowing limited transferability
New Human Factors	• Ergonomically correct for working conditions • A pleasurable alternative to sitting
Visual Appeal	• Distinctive and identifiable • Contemporary to office culture
Functional Considerations	• Intuitively understood as a place to work • A surface to work on, electricity, adjustable shade, minimal seating
Proposed Materials	• Durable / strong / safe • Clean, easily washed • Minimal material use through product combination
Users & Context	• Strategically placed for maximized potential use • Promotion of group activity and opportunities for social interaction

Ideation

SKETCHING

As a first method of the ideation stage, focused sketching was undertaken to explore forms, details, components, scenarios, and contexts that might inform the emerging hand-railing workstation.

Figure 7.8 depicts a rough sketch of a few contexts in which hand-railings typically exist and would be appropriate for intervention. In addition to Auckland's harbourfront, it was considered that a multi-functional, dynamic hand-railing intervention could be successful and desirable in other contexts as well. Suggested are a series of urban edge conditions where hand-railings tend to exist, including: 1) River side scenarios, 2) Garden side scenarios, 3) Rooftop scenarios, and 4) Playground-side scenarios.

*Figure 7.8* Potential scenarios for a hand-railing workstation

SCALE MODEL MAKING

Due to the form-based requirements involved it transforming a virtually two-dimensional hand-railing into three-dimensions, scale models were developed early in the creative stage with the purpose of examining proportional form, color application, and potential materials. Ten variations were developed exploring a variety of table and seat arrangements, material properties, and identifiable design cues.

An informal assessment of sketch model alternatives involving colleagues helped to identify the following desirable features:

• Minimal use of color / color as a sparse accent to design

• Permeable / semi-permeable table surfaces for drainage purposes

• Seating that can be 'slipped into' – supportive yet not overbearing

• Creating a contemporary look and feel with sleek form and material choices

• Maintaining appeal to groups / couples / and two-person meetings

Figure 7.9 Depictions of the ten scale model workstation concepts
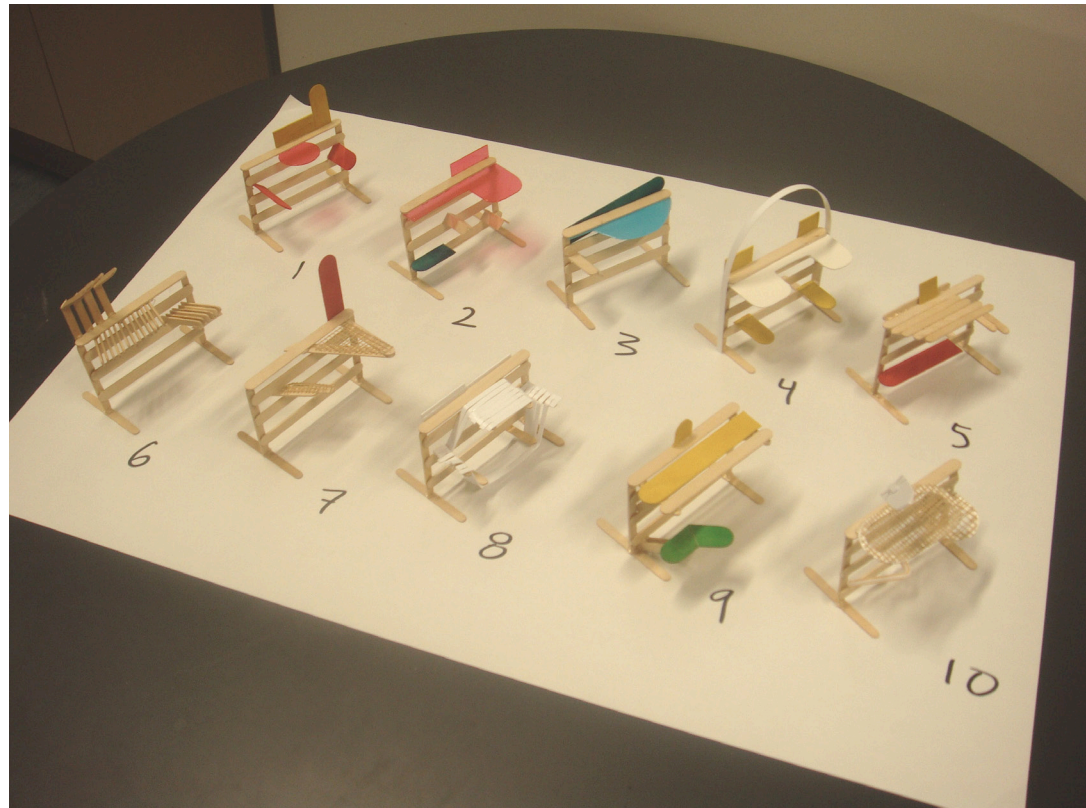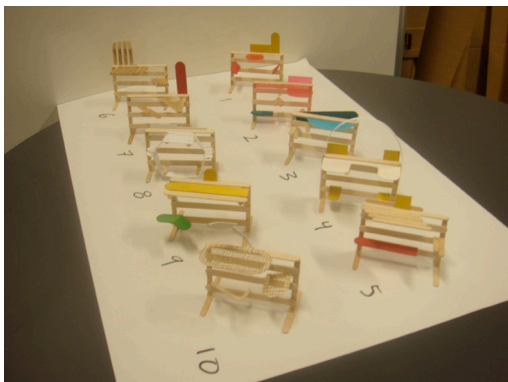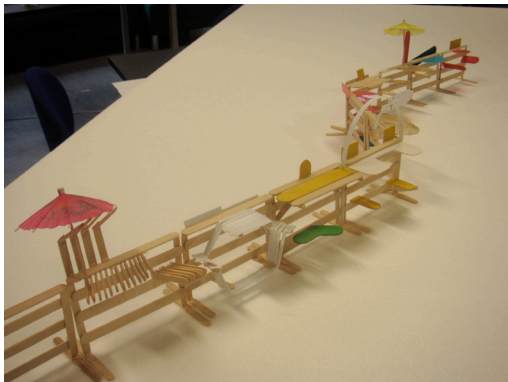
COMPUTER-AIDED DESIGN (CAD)

Taking into consideration the desirable features that emerged through scale modeling, design development of the standing work-station proceeded to a Computer-Aided Design (CAD) phase. CAD was used first as a tool for developing and analyzing a form vocabulary, and then for refining design and making final design decisions.

Displayed below are two construction / installation options for the hand-railing intervention that were conceived and then communicated using CAD. The first option (*Figure 7.10*) depicts a collection of railing 'modules' that imply permanent installation. The second option (*Figure 7.11*) depicts the intervention as 'components' or attachments to an existing railing. The second option imparts a temporary quality to the design in which attachments can be removed and rearranged periodically. Based on these options, it was determined that a combination of both solid installation and adaptability would create the most optimal design scenario.

A
Standard
Station

B
Individual
Station

C
Group
Station

Figure 7.10 The workstation as complete railing sections

B power / light

A standard frame

C group table

E lean seat

D individual table
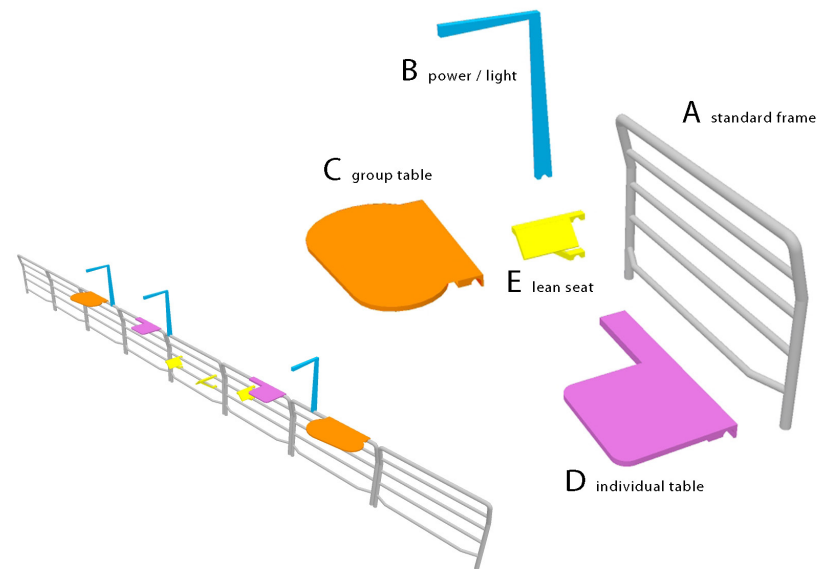
Figure 7.11 The workstation as a series of railing attachments

Figure 7.12 - 7.15 depict the final four alternative hand-railing workstation designs representing a variety of material and formal combinations. These alternatives were primarily based on following the contours and properties of a railing, in which design features were integrated directly into the railing's construction. Deviations within the alternatives occurred in material choices, formal composition, and specific details.

Based on alternatives, a determination was made to pursue the second alternative (*Figure 7.13*) that alluded to bended and folded sheet metal extending from the flat plane of the hand-railing's balister base. Using sheet metal would give the table and seat surfaces strength and stability, while maintaining a contemporary and original appearance.

Figure 7.12 Alternative One

Figure 7.13 Alternative two

Figure 7.14 Alternative Three

Figure 7.15 Alternative Four

Feedback

Informal discussions with design colleagues provided a consistent level of feedback regarding design development in this creative stage. Reoccurring themes from discussions revolved around establishing a clear and contemporary aesthetic. A general consensus was reached that the design intent was sound in principle, but that the formal aesthetics had to be compelling. And because the concept implied design of a relatively new genre in product design, establishing a new and compelling precedent was important.

Through much of the design development, the form factor was sharp and angular, yet a final design felt resolved when a level of softness and 'friendliness' was integrated. Much skepticism was expressed around viability and/or importance of the movable umbrellas, and therefore these, and other extraneous components, were deemphasized in the final design. The final design concept represents an effort to achieve salience in form and clarity of use.

7.3. Communication Stage

Delivery

FINAL CONCEPT | THE HUB

Introducing The Hub on the Harbour - an urban furniture collection created in response to the sedentary lifestyle that most office workers endure. This collection provides highly functional work-stations in public that temporarily alleviate the routine of a typical office day. The core of this urban furniture concept is based on supporting varied upright ergonomic positions for brief work encounters and activity in the outdoors. The hand-railing was chosen as the subject of design intervention because, not only does it support altered ergonomic standing positions, railings are also often located at the edge of urban environs where the draw to gather and enjoy a little piece of nature already exists.
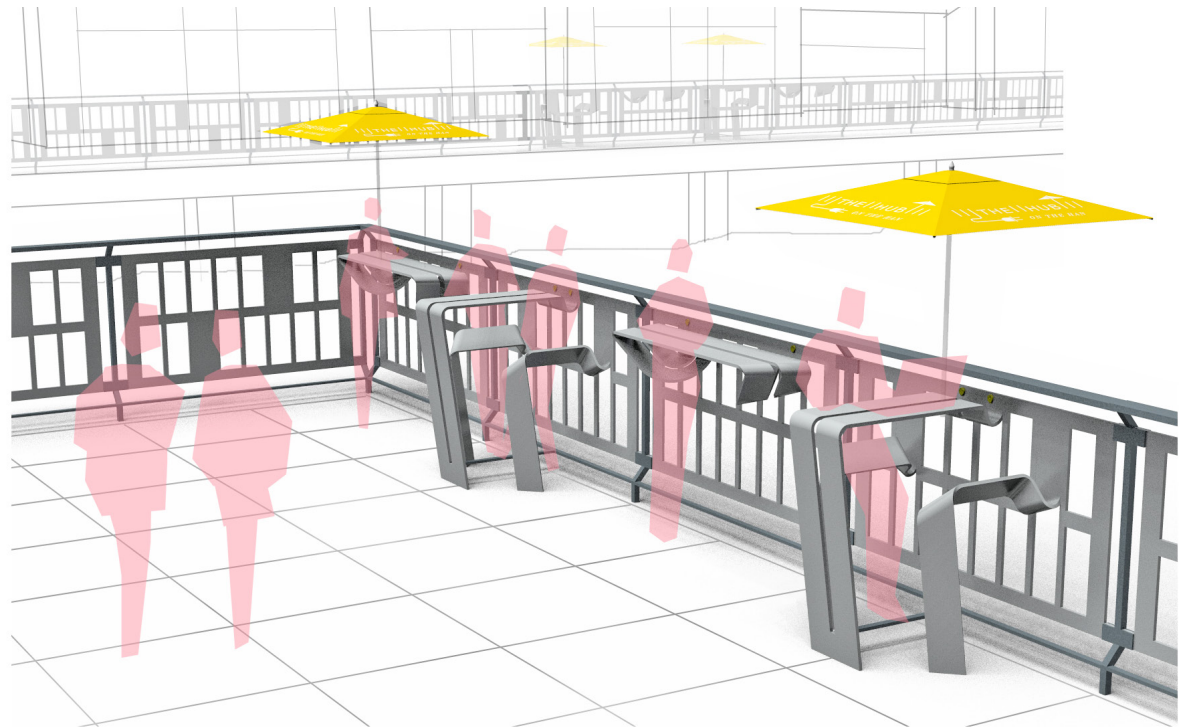
Figure 7.16 Rendering of the final Hub on the Harbour standing workstation concept

PROPOSED MATERIALS

Proposed material for The Hub specifies contemporary, durable, and malleable metals in a visually light composition that is intuitively functional. The final design consists of a set of interchangeable railing panels constructed from stamping, folding, and welding sheet metal (steel or aluminum) into two options:

(1) An extended table surface with angled seats to accommodate leaning,

(2) A long, lengthwise table surface to accommodate standing,

Optional components: electricity outlets, umbrella stands, and bag hooks.

Figure 7.17 The Hub workstation in a rooftop context

Figure 7.18 Renderings of The Hub construction and components

Evaluation

A professional evaluation for The Hub on the Harbour concept is presented within the expert interviews summary in chapter 9 of this thesis.

Personal Reflections

- **Idiosyncratic behavior can be an indication of unmet needs:** Although not necessarily a common behavior, the standing work meetings observed in this study suggested that this activity is possible, and gave insight into a user proclivity. In some cases, these proclivities were performed despite what the space and/or furniture pieces intended to support.
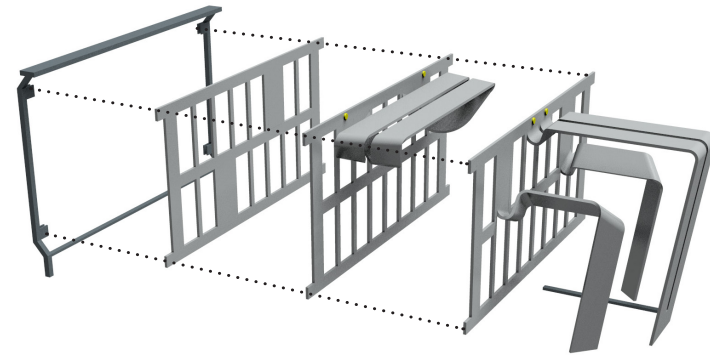
- **Ergonomically oriented design may narrow user potential:** In trying to design an ergonomically correct workstation for the average user, it's possible that other classes of users may get excluded from using the design. Upon reflection, it was recognized that the final design for The Hub may have become too prescriptive in its intended-use - an affect that could hinder its ultimate success.

- **A 'hand-railing' intervention presents an example of the potential for added-value through multi-functionality:** Investigating the hand-railing design typology in public spaces revealed a myriad of opportunities for combining public design components. The vast array of uni-functional objects that clutter public spaces present an incredible opportunity for combining and/or appending functional

and aesthetic qualities through design that make artifacts more efficient and appealing to human-centered needs.

- **Computer-Aided Design is an effective design communication tool, but should be employed primarily after thorough processes of ideation and model-making**: For this project, design explorations suffered when iterative design development was attempted through a Computer-Aided Design processes. The constraints of using the computer to design stifled a form-finding process and led to many unimpressive concepts. Only after returning to model-making did a compelling concept finally emerge.

- **Salient style is important:** Early versions of The Hub working station followed an aesthetic that was purely functional and therefore somewhat minimal. However, feedback concerning these early versions expressed a general distaste for the design. This illuminated the reality that aesthetic visual appeal cannot be underrated, and to successfully 'sell' a new design, it would have to be visually exciting.

NEXT STEPS

In order to fully resolve The Hub concept, an extensive process of product prototyping and full-scaled development would have to be undertaken to thoroughly understand material and construction constraints. Further research would involve the incorporation of such constraints in continued design development.

8. The Buttress

INTRODUCTION

This project was the final phase in practical research for the Public-Object Nexus. At the commencement of the Buttress project, the bulk of the background research had been completed, with the full development of the open-affordances framework. The opportunity for this final project focused on responding to the concept of open-affordances in urban furniture design, and specifically the notion of flexibility.

Personal reflections from the two previous projects had determined that design outcomes from pervious proposals could be described as 'over-prescriptive' in the type of activity they could support, and manner in which it was supported. The aspect of flexibility - identified as a crucial aspect of open-affordances - had not yet been sufficiently addressed through this study.

In the field of environmental design, flexibility generally refers to design that can adapt when external changes occur. With open-affordances, the external change is an act instigated by users, through physical effort or perceptual reinterpretation. The prospect of flexibility is difficult to manage because it implies an element of uncertainty. Uncertainty can create both risks and opportunities in a system, yet it is with the existence of uncertainty that flexibility becomes valuable.

Therefore, the challenge to implementing flexible and dynamic design into urban furniture became a key opportunity. The sub-questions that drove this inquiry included: How can the prescriptive boundaries of urban furniture design be liberated? What are the issues around implementing flexible urban furniture? How might aesthetics affect adoption and preferential use? And how might flexible design trigger social interaction in public spaces? The process of addressing these questions and evaluating design outcomes fed back into reinforcing the central research question and the open-affordances design framework.

OBJECTIVES

The key objectives of this final design project were to:

- Reflect and analyze insights from preceding research and design phases in the context of the overall objectives of this study,

- Identify design opportunities for developing dynamic, interactive, and socially conducive urban furniture,

- Incorporate these opportunities into a final design proposal that explores the flexibility aspect of open-affordances,

- Construct a full size prototype for exhibiting, testing in the field, and acquiring an expert evaluation.

OPEN-AFFORDANCES: FLEXIBILITY

Human-centered design research methods were employed in order to inform a primary goal of designing, building, and testing a full size prototypical urban furniture piece that effectively conveyed the flexibility facet of open-affordances. It was considered that completion of a full size prototype would offer lessons in form, scale, ergonomics, and context sensitivity, in addition to enabling field testing and an expert evaluation.
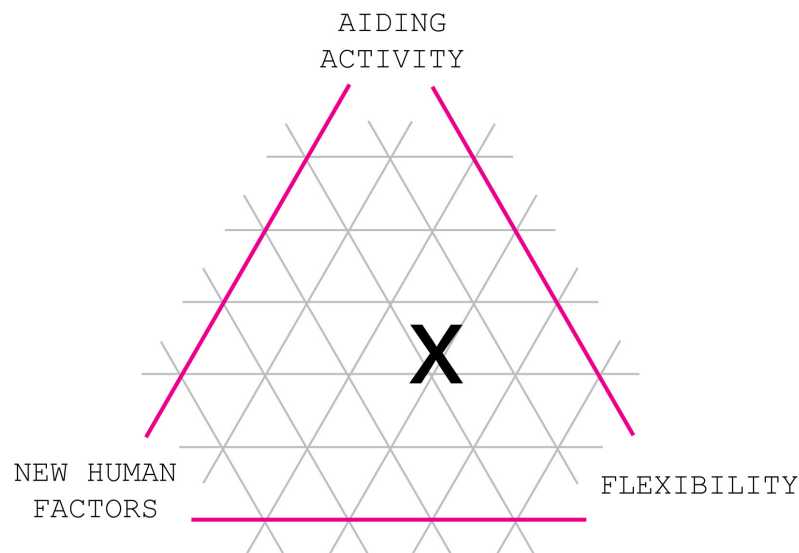

Figure 8.1 Emphasizing the *Flexibility* facet of Open-Affordances

8.1. Research Stage

Passive Observations

The key insights that informed this sub-project were based on the process of passive observations undertaken in the Auckland CBD (refer to chapter 4). Key to this was a pattern that emerged in which people using public spaces often gave preference to flexible elements. For example, given a choice, users often exhibited a partiality toward urban furniture that could be openly interpreted and/or offered various options of user-interaction. The type of flexibility that was highlighted includes an amalgamation of freely interoperable design and physical adaptability.

This insight also illuminated the converse – that most of the existing objects in public spaces are permanently fixed in place. Urban furniture provisions, such as benches, were often bountiful, yet their fixed position was stifling. It was the assertion of the researcher that an array of urban furniture in Auckland's public spaces could be more efficiently and readily used if people were able to arrange pieces how they wanted.

INSIGHTS

The following observational insights, resultant from the summary of participant observations (chapter 4), drove the progression of design conceptualization for this stage. Observations highlighted adaptive design that supports open-ended activity as an impetus for design.

(1) Public space users tend to prefer flexible design provisions when a choice exists.

(2) Where possible, multiple interpretations of an object's functionally tend to occur.

(3) As premeditated personal activity was observed as a primary motivation of behavior, public furniture provisions often serve the capacity of supporting this premeditated activity.

Figure 8.2 Public space users adapting a planter's function for socializing

INTERPRETATION

Again, these observational insights only indicate a tendency, not necessarily a predominant behavior. Yet, extreme and idiosyncratic behaviors can indicate a latent user-need. In relation to these insights, it could be interpreted that urban furniture design might most effectively support a user activity through the freely interoperable, non-prescriptive provisions of open-ended design. The above insights suggest that perhaps predetermining the specific needs and compulsory activities of the public is not as feasible and/or desirable as previously thought. Rather, by instilling flexibility and open-endedness in design, public objects may have a better chance of affording user activity based on the user's own terms. This evolved approach could ultimately result in the activated public spaces that underscore the central aim of this project.

Therefore, the driving inquiries for the ensuing design process involved questions around what is flexible, where flexibility already exists, and what might constitute the challenges of flexible and/or movable urban furniture.

Contextual Review

FLEXIBILITY PREMISE

According to Whyte (1980), the movability of urban furniture in public spaces is a significant asset, as it enlarges choice. This includes choice to "move into the sun, out of it, to make room for groups, move away from them." The possibility of choice is as important as the exercise of it (Whyte, 1980). Whyte also suggests, "The movability of [urban furniture] is a declaration of autonomy, to oneself, and rather satisfying." (p.35). Autonomy and the sense of ownership have a direct connection to the well-being of a community and the citizens within.

> What determines well-being is neither goods nor their characteristics, but rather the possibility of doing various things making use of those goods or their characteristics. It is exactly this concept which enables someone to approach their idea of well-being, giving them the possibility of 'being' (what they want to be) and 'doing' (what they want to do). (Manzini & Jegou, 2003)

A public space is fundamentally an open-ended space, continually evolving, embracing its imperfection, and constructing its future communally (Baur, 2008). The incorporation of flexible elements into urban furniture facilitates a public space's ability to evolve and respond to dynamic occurrences such as special events, festivals, differing weather patterns, etc. It is this evolution, in communion with dynamic design, that creates enduring relationships between people, objects, and environments overtime (Chapman, 2005).

SURVEY OF EXISTING DESIGN

In terms of flexible urban furniture design, not much precedent exists in either the spaces observed or on the market in general. The 'pillows' at the Britomart plaza offered an exception, and appeared to be quite popular when available. Additionally, a recent provision of shared bicycles were introduced to the Auckland CBD. However, the bicycles require payment in order to use, and therefore didn't offer an example of truly 'public' design. Perhaps the most widely publicized example of movable furniture exists in New York City's Bryant Park and Times Square. These spaces offer a positive example of successfully implemented movable furniture (tables and chairs) that are exceedingly used and surprisingly adept at avoiding vandalism and theft.

Image feeds for this effort also included a search for many analogous scenarios including; outdoor furniture, beach furniture, organic elements such as seeds from a tree, movable furniture, etc. Examples of existing design and inspirational images permeated into the following brainstorming and ideation phases.

8.2. Research Stage

Brainstorming

In an effort to initiate the creative stage for this project, a large group brainstorming session was held with an objective to expand and diversify potential concepts that respond to the aspects of flexibility and social interaction. The style of brainstorming that was undertaken, sometimes referred to as an "idea engine," follows a technique for generating as many ideas as possible in a confined time frame - in this case, one hour (Kelley & Littman, 2001). A topic or problem statement is presented, and participants collectively contribute whatever comes to their mind regarding the given topic. Ideas are documented in a large written format in front of the group with an underlying goal to simply produce a sizeable quantity of ideas.

PROCEDURE

A diverse collection of design colleagues were invited to participate in the brainstorm – (6 fellow students, and 2 supervisors), and the session was held in the researchers studio as Kelley and Littman (2001) recommend. Brainstorm participants were asked to contribute original ideas to a concise set of topics. Ideas were then analyzed, categorized, and grouped into common themes and further developed into a set of four alternatives informed by both the brainstorm and the design objectives for this project. Participants were then asked to informally assess the resulting four alternatives based on likeability, feasibility, originality, and constructability. This informal assessment helped lead to a final design concept.

THE BRAINSTORM PROCESS

Four principal topics were chosen to guide the brainstorming session based on project intentions. An initial set of topics were presented as a "warm-up" to catalyze an inspired session, as later topics were to be more challenging. These topics included:

• Healthy activities: Any human activity (verb) that is perceived as 'healthy'

• Products that can be shared: Products on the market - typically privately owned - that can hold potential for sharing

• Social activities that are considered positive and healthy

• Specifically flexible public product ideas

The session generated a plethora of ideas, ranging from practical to radical, and all seemingly new in terms of additions to public space. Some participants stayed late to aid in cross-referencing idea where correlating topics and themes were connected and accentuated as common threads. These common threads included ideas related to food/eating, hygiene, relaxation, art, exercise, recreation, education, and entertainment (as shown in *Figure 8.3*).

Although reflections on the outcome of the brainstorm indicated that brainstorming 'topics' may have been too broad (therefore garnering ideas with varied pertinence to the project's design objectives), applicable ideas within the aforementioned topics did emerge from the brainstorm. Ideas were identified, measured, and selected by the researcher based on objective criteria such as the appeal to flexibility and open-affordances, the support of

sociability, positioning as a 'product design,' constructability as a prototype, relevance to observational research contexts, and feasibility within the scope of this study. From this, the following four concept alternatives were presented:

1) Shared hand carts for transporting urban goods

2) Movable sets of table and chair combinations

3) Urban furniture reminiscent of beach culture and sandboxes

4) Modular organic objects for open user-interpretation

Common characteristics shared between these concepts included:

- Movability: Each concept implied a transportable and 'un-fixed' design,

- Scale: Each concept was envisioned at the product scale (human-scale), in which manufacture would transpire through standard industrial production means (in large production runs). Basically, each concept implied mass-production, not 'one-offs,'

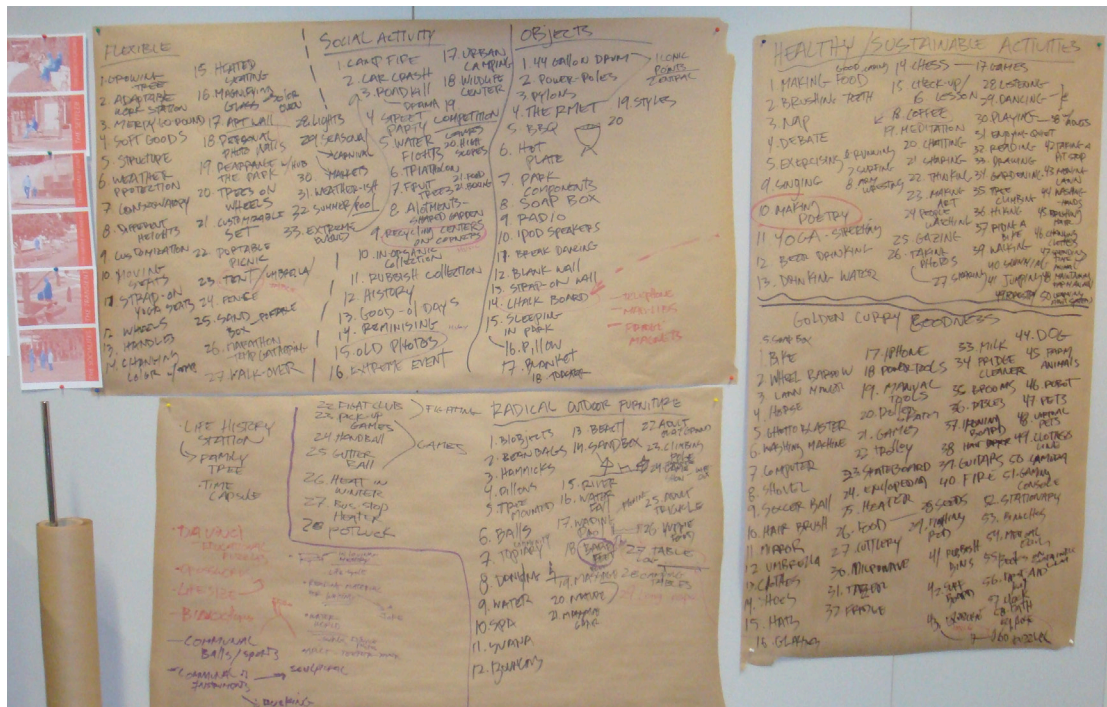- Aiding Activity: Each concept was meant to revolve around supporting open-ended, active user experiences.

Figure 8.3 Results from the large group brainstorm 'idea engine' process

ITERATIVE SKETCH IDEATIONS

The next phase in this process was an effort to develop and resolve the four resultant concepts so that alternatives could be re-presented to brainstorm participants for feedback. The goal was to utilize an extensive iterative drawing technique to extrapolate ideas and forms, and resolve a set of comparable concepts. Using the aforementioned concepts as a departure point, the following design themes were investigated through iterative drawing (*Figure 8.4*): Outdoor tables with movable attributes, trolley and hand-cart archetypes (dolly, shopping cart, wheel barrow), picnic table reinvention, form studies of the trolley, beach/picnic archetypes, outdoor padding and cushioning, organic 'blobject' forms, lawn chairs, basic beach furniture typologies, couch forms, etc.
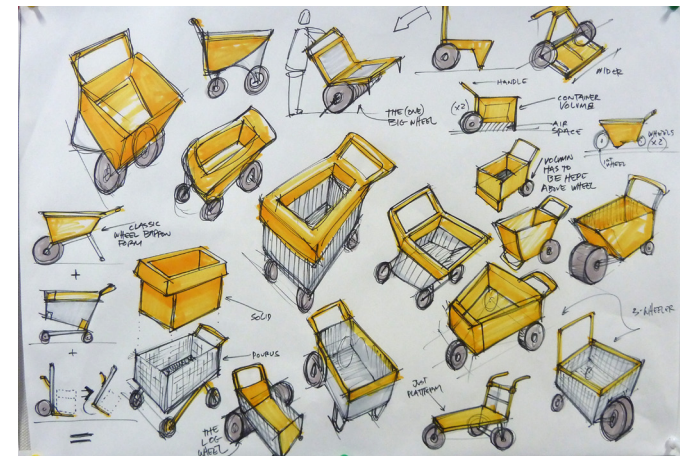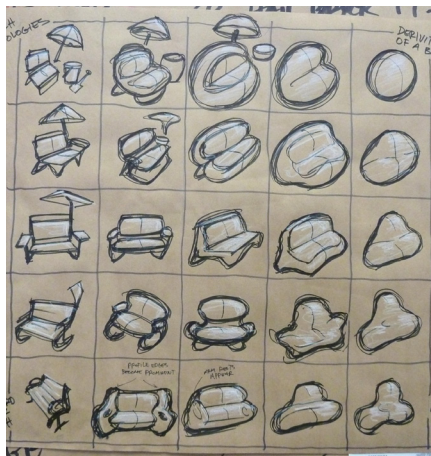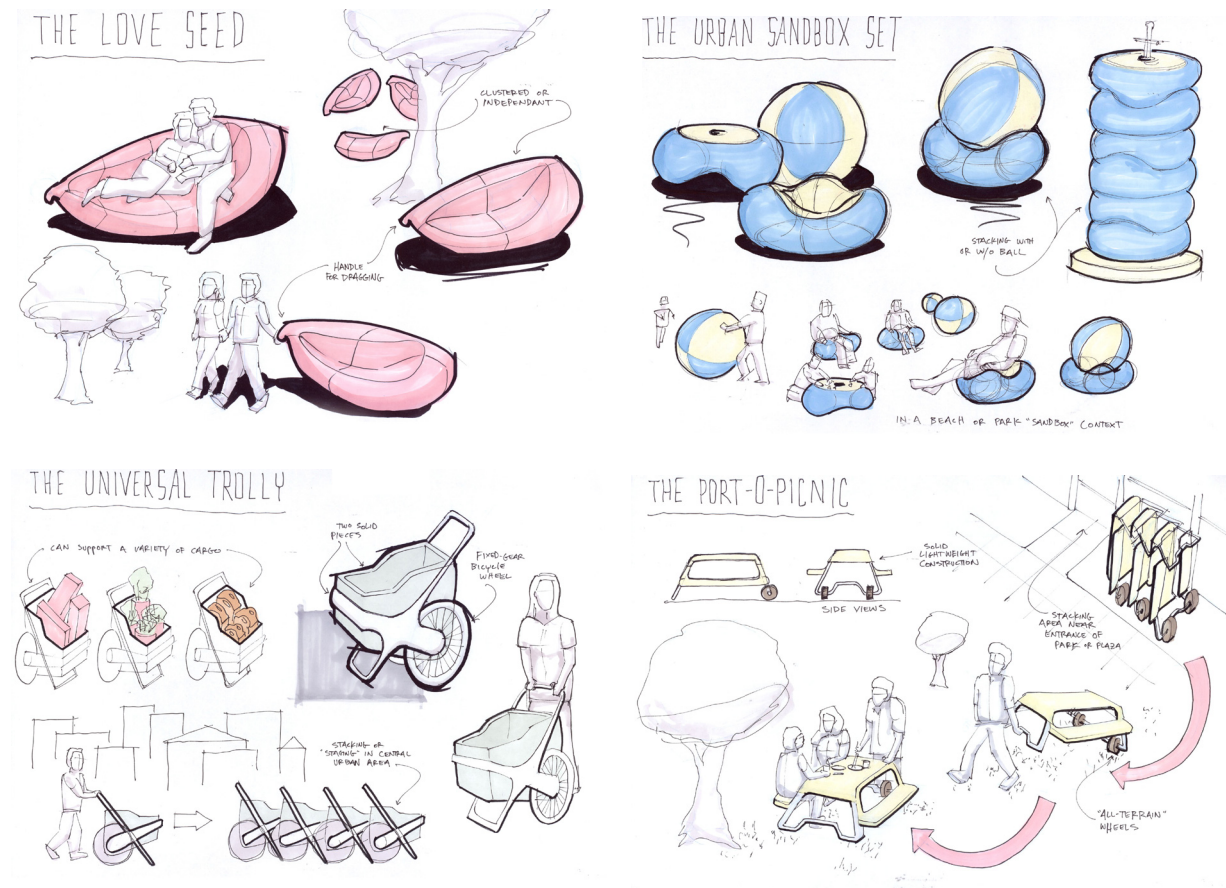

Figure 8.4 Excerpts from the 'wall' of iterative sketching that was undertaken to effectively resolve four design concept alternatives

Through iterative sketching, design concepts evolved until a level of resolution was reached that allowed the researcher to illustrate complete and tangible alternatives for subsequent assessment. Alternatives from this process represent a respective continuum of urban furniture innovation ranging from novel to practical – all of which purport to challenge the notion of product design for public spaces. *Figure 8.5* exhibits these final alternatives.

Figure 8.5 Concept Alternatives (from top left, clockwise)

1) The Love Seed: A movable, organically styled loveseat

2) The Urban Sandbox: A reference to beach products and play

3) The Port-O-Picnic: A molded plastic picnic table on wheels

4) The Universal Trolley: A shared urban cart for carrying urban incidentals

Brainstorm participants were brought back and asked to assess design alternatives for aspects of flexibility, feasibility, prototype-ability, and visual appeal. The majority of participants agreed that combining desirable characteristics of the 'love seed' and the 'urban sandbox' held the most potential for achieving project objectives. Informal comments highlighted the importance of playfulness, originality and distinctiveness in form, and simplicity of construction. The ensuing concept synthesis describes how this extensive brainstorm and ideation process led to a final design concept.

Concept Synthesis

Informed by parallel practices of human-centered design research and generative practical design methods, the following elements compose a synthesis for final design:

- **The potential of flexible design in public spaces:** Where possible, public space users indicated a tendency to choose urban furniture that provided open-ended use and/or movability. Whyte (1980) advocates the provision of movable furniture citing its ability to instill a sense of autonomy and ownership for users toward public space.

- **Activity defined by the user and less prescribed through design:** In an attempt to underscore desirable activities with public product design, the preceding design projects from this study became overly prescriptive. In response to this reflection was an indication that design could indeed support activity, but perhaps more effectively through an 'open-ended' design approach.

- **A compelling visual aesthetic:** Proposal for new urban furniture designs should be visually compelling. Utility and function are important, but not enough to create the visceral response necessary to attract initial use. The design needs to be striking.

- **Strong and light material application:** In order to infuse the attribute of movability, an urban furniture piece needs to be strong and durable, and at the same time light enough to handle.

CRITICAL SUCCESS FACTORS

In order to proceed into the final phases of concept development, critical success factors were established to guide design decisions.

Intent	• Instilling user-autonomy through open interpretation of furniture arrangements • Creating a 'trigger' for social interaction • Promoting civic participation and ownership in public spaces
Flexibility	• Multi-functionality • Movability and open interpretation
Aiding Activity	• Social activity, user-defined activity
New Human Factors	• Variable ergonomic proportions for sitting/lounging
Visual Appeal	• Identity, novelty / newness, attractive • Fun, playful, not too serious
Functional Considerations	• Ease of movement, intuitive cues for how to move (handles, etc) • Preventative measures against vandalism and theft
Proposed Materials	• Light and strong • Durability as a key attribute
Users & Context	• Appropriate in confined urban plaza contexts with clear borders • Free use for everyone

Ideation

FINAL CONCEPT DIRECTION

Through preceding brainstorm and synthesis phases, a final concept direction was developed highlighting an aesthetically compelling set of plaza benches and tables that are movable and flippable. The adaptable attributes of this concept supported a variety of potential arrangements and ergonomic positions – a defining feature being that the underside could be used for lounging, in a style reminiscent of a hammock. At this stage, the material had not yet been defined, but it was clear that it needed to be strong to support the bench's implied cantilever.

The 'reversible park set' concept was informed by the combination of 'love seed' and 'urban sandbox' alternatives, and was determined as an appropriate direction for meeting the project objectives. The 'table' component of the concept was eventually discarded due to the limited scope of constructability in this study.
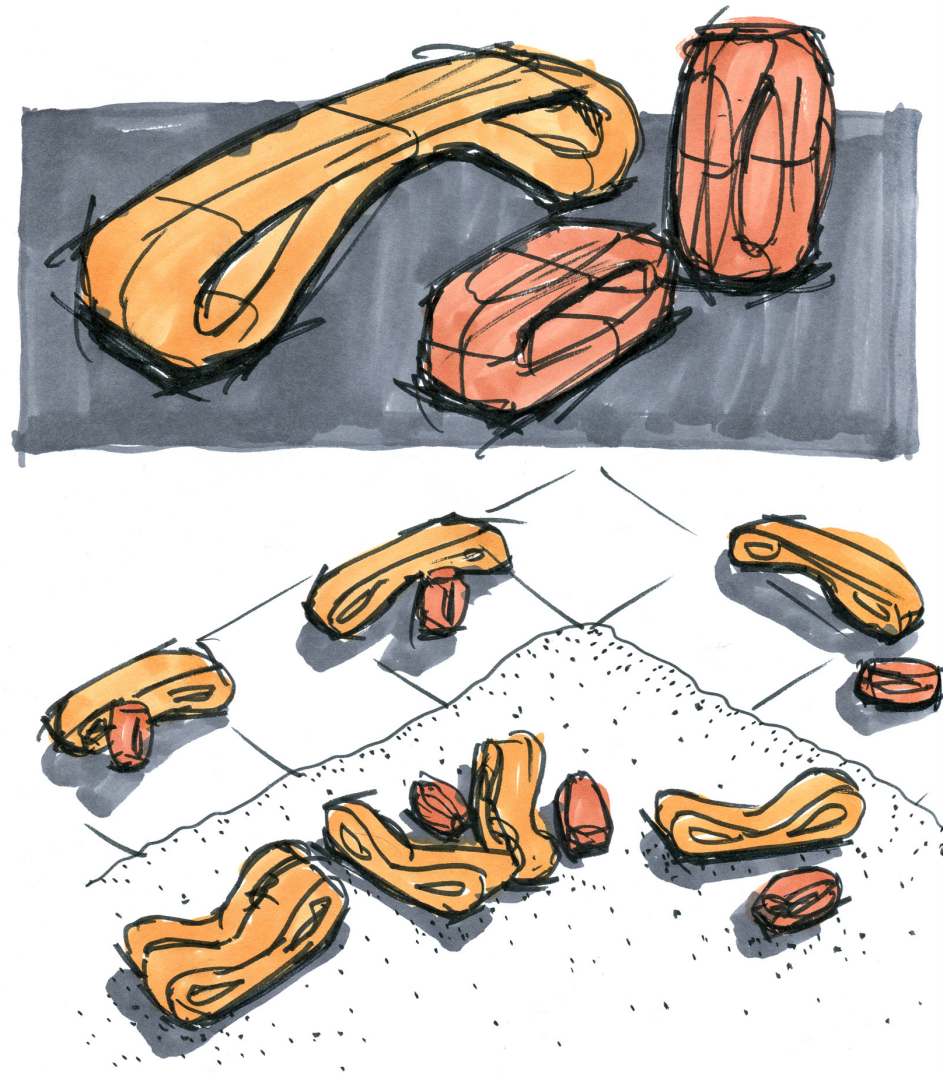
Figure 8.6 The Reversible Park Set final concept

FULL SCALE MOCK-UP

In acknowledgement that the final concept 'bench' was largely sculptural in nature, creating a full-size mock-up early in the design development process was essential. The mock-up was built to investigate ergonomic qualities such as angles and appropriate dimensions, in addition to issues of general movability and aesthetic quality.

Creating a full-size mock-up in this phase offered many valuable lessons; the length and width of the bench needed to be extended to more effectively support an average person; the angles of the underside had to be readjusted to a steeper and straighter pitch for proper comfort; minimizing bulk and weight would aid in movability and visual appeal, and handles for carrying had to be resolved.

Figure 8.7 A series of photos depicting the full-size mock-up and various ergonomic tests with the mock-up

SCALE MODELS

A set of scale models was created with the purpose of developing and analyzing a range of form and material proposals for the bench design. Each model represented a variation of the original bench concept in which the details of aesthetic and material properties could be compared.

A general consensus between the researcher and colleagues formed around the appeal and feasibility of option three – the 'solid plastic profile' option. Elegant simplicity was a discussed characteristic that became a key driver of the final bench design.
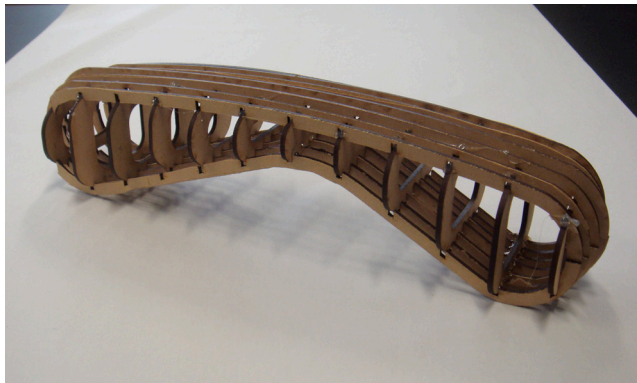

Figure 8.8 The plastic 'sliceform' option

Figure 8.9 The wooden slat with 'arms' option

Figure 8.10 The solid plastic profile option

Figure 8.11 Aluminum mesh option

COMPUTER-AIDED DESIGN (CAD)

Dimensions from the preferred scale model were transferred into CAD software in preparation for the construction of a final prototype. Adjustments were made in the computer to the proportions of the inner and outer profiles to give the bench three-dimensional sculptural interest and to minimize the form's visual 'bulk'. The edges and inner contours were also chamfered to give definition to corners and breakup the object's large flat surface areas.

After a final form had been completed, the digital bench was then divided into four sections (in 120mm tall increments) and arranged on a singular flat digital plane in preparation for milling the object with a computer numeric control (CNC) machine.
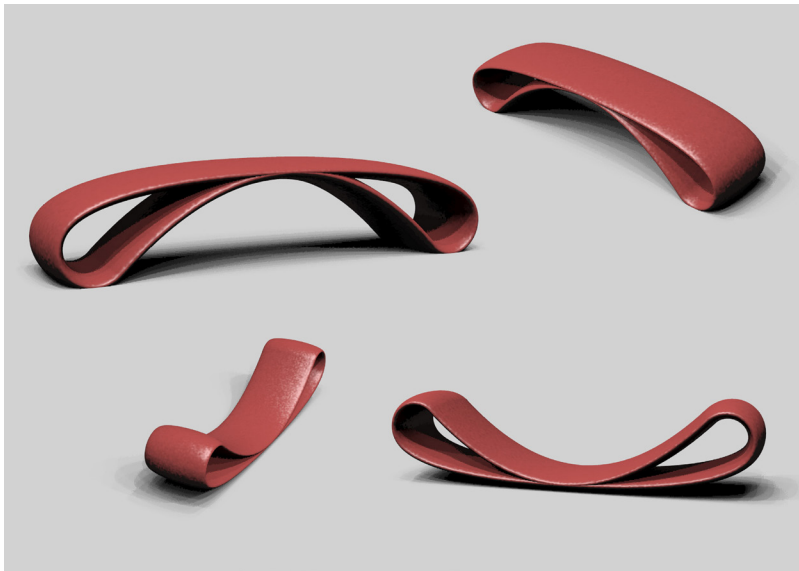
Figure 8.12 Early CAD renditions of the bench concept
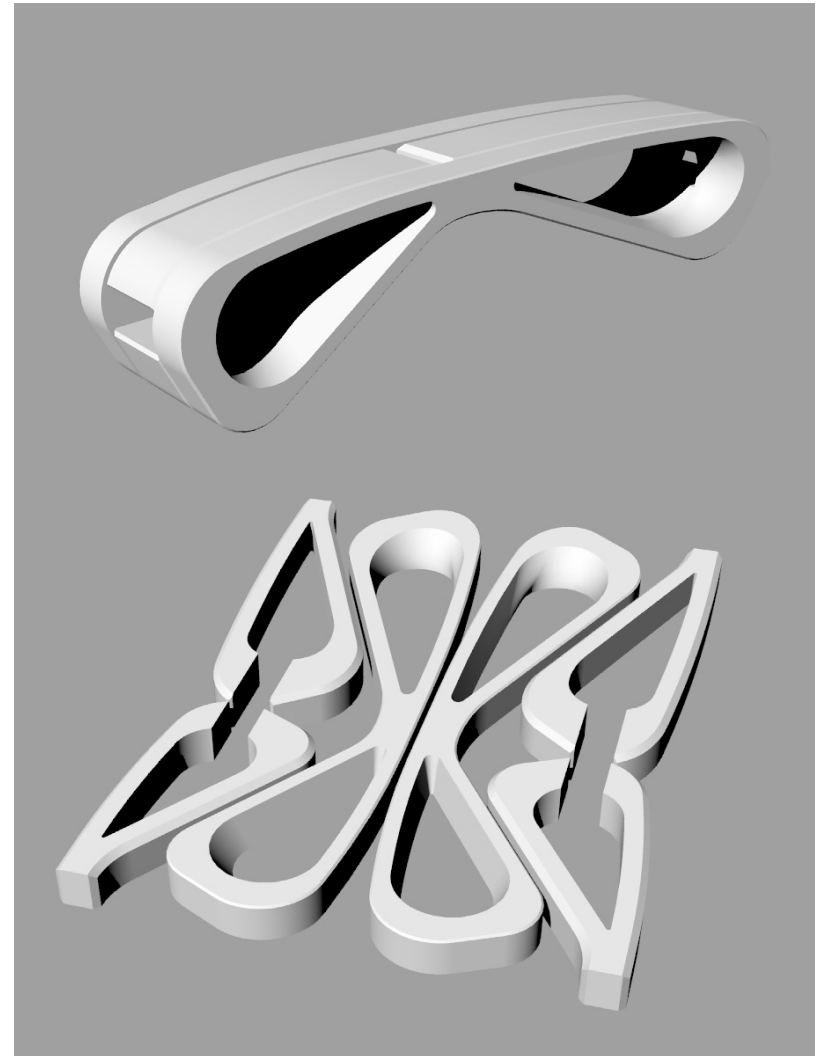
Figure 8.13 Final CAD model and sections for CNC milling

FINAL PROTOTYPE CONSTRUCTION

The final prototype was constructed out of CNC milled polystyrene sections, which were then glued together and sealed with 'polyfiller.' *Figure 8.14* exhibits this phase in the prototyping process. After the full-scale object was constructed, fiberglass and resin were applied to the polystyrene form for strengthening purposes, followed by bogging and surface filling, and finally the application of colored semi-gloss paint.

Considering the minimal application of fiberglass reinforcement, the final prototype was surprisingly robust. The object was sittable and could withstand the rough handling and transportation for field testing.

Figure 8.14 Photographs of the final polystyrene prototype
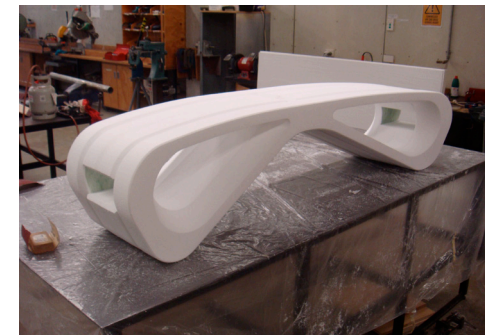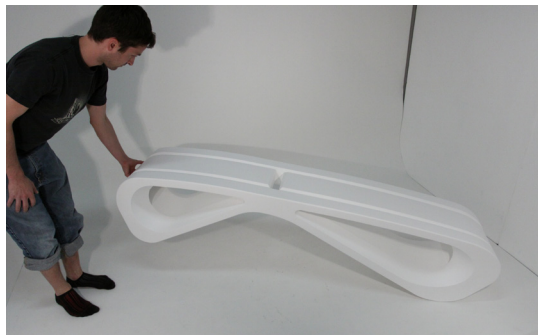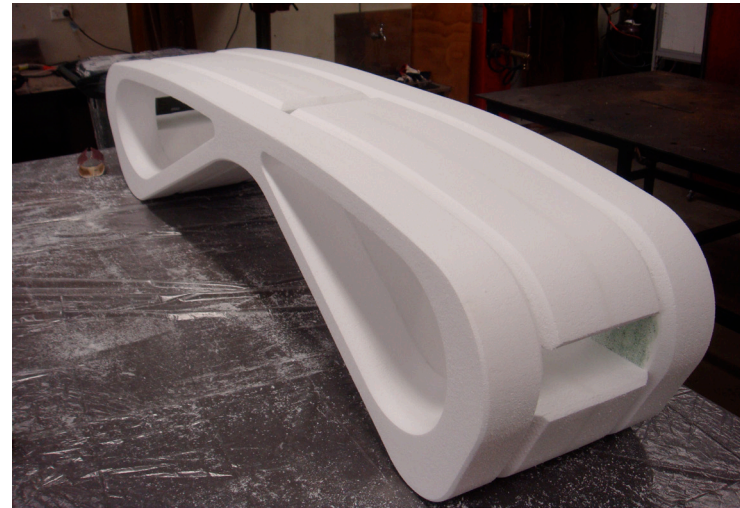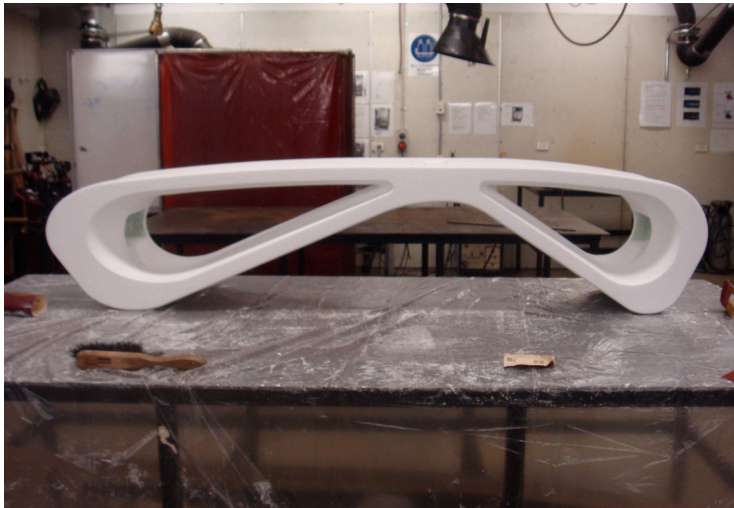
8.3. Communication Stage

Delivery

FINAL CONCEPT | THE BUTTRESS

Introducing The Buttress - a movable street furniture piece designed to support urban social life. Located primarily in urban parks and plazas, this lightweight and durable furniture piece can be easily moved and flipped allowing residents of the city to create personalized furniture arrangements in public spaces. Two positions for The Buttress were anticipated through design; as a bench, and upside-down as a lounger, yet, as a collection of pieces, the movable nature of The Buttress allows for an infinite variety of compositions - only limited by confines of the public space and the imagination of its users. The title of the piece, The Buttress, is derived from an architectural term referring to support structures that aid in propping up building walls.

Figure 8.16 Rendering of the final Buttress bench set

PROPOSED MATERIALS

The Buttress concept proposes construction using rotational molding technology with medium density polyethylene, reinforced by two thin internal steel profiles, and pigmented in a variety of colors to suit the environment in which it sits. Strong lines and defined edges give the design a sturdy and refined appearance, while the material and construction impart an intuitive lightness encouraging people to touch, interact with, and move this piece of urban furniture. Where necessary, issues of theft and maintenance can be alleviating through the use of tethered locking systems and/or the addition of low-cost GPS tracking units.

Figure 8.17 Photoshop rendering of multiple benches in use

Figure 8.18 The final prototype in the field

Figure 8.19 Photoshop rendering demonstrating potential organic arrangement of the Buttress in a plaza

THE BUTTRESS | 98

Evaluation

The evaluation process for The Buttress concept included a small, informal focus group for physically testing the design (summarized in the following section), and expert interviews for attaining a professional evaluation (refer to chapter 9).

Focus Group

Upon completion of a working 'Buttress' prototype (true in proportion and weight, but not material), an informal focus group was gathered in order to ascertain visceral and behavioral impressions of the object, test functional interpretations, and measure feedback against the objectives of the design. As a form of qualitative research, focus groups can be defined as a loosely structured means of obtaining opinions related to a specific topic through group feedback (Edmonds, 2001). Some of the most common uses for a focus group include: positioning products or services, testing new concepts, and testing usability of a product (Edmonds, 2001).

The objective of this evaluation method was to acquire feedback from a group of hypothetical users to test the functionally of the Buttress and measure the viability of its flexible affordances.

PROCEDURE

A small group of Auckland city residents, two females and a male, served as participants in this informal evaluation session. Selection of these participants was based on the willingness to participate, and a prerequisite that they come from outside of the design profession in order to offer a less biased opinion regarding design.

Participants were left alone for one hour with the Buttress in a small urban park. They were asked to simply 'spend time' with the Buttress, do whatever they wanted with it, and take photos while doing it. Following this user-testing session, participants offered feedback through a loosely structured discussion moderated by the researcher. Thematic areas from this discussion are summarized in the following sections.

SUMMARY OF FEEDBACK

Intuitive visceral response

Focus group participants expressed favor for the Buttress' form and style and were generally impressed by visual quality of the object. One participant's description of the object was "Cheerful and Friendly."

The participant group expressed that, upon first impression, they thought the Buttress appeared "light weight and portable," and agreed that the organic shape of the object helped it both integrate into an outdoor setting, and "make you want to play with it." A general consensus among the group was highlighted aspects of design and color that brought interest to the public space. And in terms of an intuitive relationship with the object, one participant explained that the design imparted a sense of being able to "do your own thing with it." However, another participant diverged, cautioning that people might be confused by the functionality of the object – not realizing it is meant to be moved and played with.
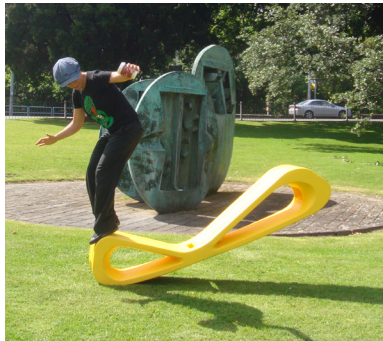
Figure 8.20 Photos taken by focus group participants in the field

Functional revisions

After spending time with the Buttress, participants commented favorably on the design's proportions and comfort – and in particular felt that the proportions of the underside for lounging seemed correct. Participants were quite forthcoming with revision recommendations such as shortening the object's length (to facilitate carrying), making it wider, adding a headrest, integrating soft materials, making it collapsible, and making it customizable. Participants agreed that providing the Buttress in a variety sizes might facilitate universal use, and perhaps adding a component that "connects the objects like Legos" could enhance interactivity.

Movability issues

The "multi-functional" quality of the Buttress was well-regarded by the group, and thoroughly tested (as evidenced in *Figure 8.20*). An array of functional variations was revealed by the focus group's interaction with the Buttress that well exceeded the imagined possibilities by the researcher. Movability was also identified as a favorable factor - allowing a user to "choose to be in the sun or the shade." Yet, with movavilibty, a concern arose around the issue of theft. Participants frankly asserted, "people will probably steal it."

A question of appropriate context

Participants agreed that the Buttress form and intuitive functionality implied "relaxation." Therefore, a consensus was conveyed that its location should be confined to relaxed urban spaces like "proper parks and plazas – as opposed to the high-energy, high-activity spaces and streetscapes that comprise a central business district.

Within the group, a concern was articulated about the look and feel of the object in terms of being appropriate for public spaces. Concerns were raised about the color and style making it feel foreign – like something "in between" what might be appropriate for a public space versus a private space. One participant asserted that "maybe it would be better in a gallery or museum space" or other similar "controlled" indoor space. Others added that the object might be well suited for different contexts like the beach, pool-side, or an outdoor pub (also adding that making it "float" would be advantageous for those contexts).

Conclusions

In general, focus group participants were delighted by the Buttress' characteristic playfulness and multi-functionality. And although one participant offered a reasonably skeptical point-of-view, the photos of participant-object interaction (taken by the group) suggest that the freedom of interpretation enabled by the Buttress catalyzed a sense of enhanced activity not usually afforded by public spaces.

Participants acknowledged that, clearly, revisions to the material composition and proportions of the Buttress would be necessary before formally introducing the object into public spaces. Though, interestingly, the group seemed inspired by the potential and (without being solicited) was very forthright with suggestions for the design's improvement.

Through this focus group, a key insight was illuminated regarding notions of human-object relationships in public spaces. Particularly, participants suggested that they had not formerly considered having any kind of "relationship" with public objects, nor did they think it was likely – especially considering that relationships are usually confined to private spaces such as the home. The proposal of the Buttress challenged their perception around the value, meaning, and contribution that urban furniture might be able to impart in the everyday lives of people.

Expert Evaluation

At this point in the study, a professional evaluation for The Buttress was conducted through expert interviews (refer to chapter 9).

Personal Reflections

- **Open-ended, multi-functional urban furniture design can offer interactive possibilities for users that don't normally exist in public spaces:** Informal evaluations of the Buttress underscored the potential value in providing truly adaptable and movable urban furniture, in which improved notions of what is possible in public space can be explored.

- **The prospect of movable urban furniture prompts concerns around theft and vandalism:** Urban furniture that is flexible and movable was a widely expressed as desirable, yet the perception of potential theft is a substantial barrier to implementation. Considerable measures would have to be taken, such as locking or tethering the furniture, in order to assuage concerns.

- **Brainstorming topics need to be carefully crafted in order to garner effective results:** Although the large brainstorming session that was conducted at the outset of The Buttress process developed many interesting ideas, the process did not adequately reflect the scope, objectives, and constraints that were underpinning the final project trajectory. Specifically defined and pertinent brainstorm topics would have most likely led to more appropriate creative solutions within project objectives.

- **Visual appeal is important:** The artistic and stylistic characteristics of design were demonstrated to be more crucial to a public product's acceptance than the researcher had first anticipated. Through the majority of the Public-Object Nexus study, a focus was given to the functional aspects of design that emphasized open-affordances for the user. Though, the Buttress project offered an indication, through feedback and evaluation, that a design's style is a major selling point and important toward success.

9. Expert Evaluation

INTRODUCTION

As a culminating phase for the Public-Object Nexus, expert interviews were conducted as a means for acquiring further feedback to help evaluate success of the project outcome. Through discussions with individuals experienced in designing, implementing, and administering public urban furniture, a range of professional perceptions and standpoints were exposed regarding appropriate public design. The result of these interviews was the generation of constructive criticism for the project's final design concepts, along with a fruitful portrayal of the opportunities and challenges that face implementation of innovative, human-centered urban furniture.

As part of the human-centered design process, expert interviews are recommended in phases where in-depth technical information is required and an expert's extensive experience with a given subject is deemed indispensable (IDEO, 2010). For this project, issues regarding material use, installation and implementation, typical user behavior, and public approval processes were all illuminated through the aid of expert insight.

EXPERTS

A range of experts from both public and private disciplines were sought after to offer professional expertise regarding the successful implementation of public urban furniture. Considering a central research question that asks how improved design of urban furniture might better support active public life, this range of experts were selected based on their capacity to inform the research question from a professional standpoint. In an effort to balance out biases, five experts with varied points of view were selected as a cohort for these informal interviews. Represented among the cohort were public administrators, council urban designers, and private design practitioners in the fields of landscape architecture and industrial design. Each expert participant revealed extensive knowledge and anecdotal evidence regarding the design and execution of built work for public constituencies.

PROCEDURE

Participants were initially contacted through e-mail correspondence and requested for a short and informal interview session. Participants were advised as the purpose of the interview: to discuss notions of urban furniture generally and critique presented design concepts specifically. Interviews took place in informal settings and lasted no longer than one hour. The interview format was conducted in an informal manner utilizing a set of open-ended questions meant to generally guide a progression of insightful discussion.

Interviews took place around a series of visual aids presented by the researcher including: (1) a summary of passive observations and findings, and (2) renderings of subsequent urban furniture design concepts (specifically, The Hub on the Harbour, and The Buttress). Each interview process began with an exploratory inquiry around the participant's prior knowledge and experience with urban furniture and their familiarity with the presented observation study locations. This was followed by an invitation to comment on the viability of the design proposals presented.

QUESTIONS

With a goal of uncovering opportunities and constraints associated to innovative urban furniture, informal interview questions were developed to guide interviews through a general discussion about role of urban furniture to a specific assessment of the potential viability of The Hub and The Buttress designs. The following is a record of the contingent questions that were prepared, and in most cases addressed, during expert interviews.

1. Describe your notions of the role that urban furniture,

2. What are the needs of public space users? What are *their* existing notions?

3. Do you think the provision of the presented design concept is a good idea? Explain,

4. How do you imagine users might interpret the presented design concept?

5. Explain how these designs might positively or negatively effect activity in public spaces,

6. What might a client (public or private) reaction to these proposals be?

7. What are the barriers to implementation?

8. Describe other urban furniture projects that exemplify success,

9. Discuss related issues of: materials, maintenance, vandalism, and ergonomics,

10. Identify other general challenges to designing for pubic spaces.

ANALYSIS AND RESULTS

Discussions were recorded with a notepad and later transcribed to a digital format. Data from the discussions was analyzed and categorized into common themes from the combination of interviews. The purpose of identifying and documenting common themes was to form a professional basis with which this project could measure and evaluate its success against its stated objectives.

9.1. Interview Response

Notions of Urban Furniture

A CONTEXTUAL APPROACH TO DESIGN

As a technique for invoking a meaningful discussion around urban furniture and the specific design thereof, participants were asked to first generally describe (1) their professional notions regarding the role of urban furniture as a compliment to urban public space, and (2) their approach to the selection and/or design of appropriate urban furniture. The majority of participants concurred that using the environment/context as a reference (existing or proposed) for selecting and/or designing urban furniture was of primary concern. "Matching [urban] furniture elements to the unique environment, scale, and vernacular of a given public space is important" (Council Urban Designer). Other factors were given as determinants to the selection and design of urban furniture such as material constraints, safety, contemporary style, accessibility, and anticipation of user groups. In relation to public spaces where equal access is an important issue, one participant noted that examining and designing for extreme user groups (children and elderly, big people and small people) is usually a prudent approach.

A STAGNANT GENRE

In relation to customizing and innovating the specific design of urban furniture elements, participants (from a design practice perspective) observed that much of the urban furniture currently populating public spaces today is not very innovative, and does not suggest much evolution in the genre over the past century. "Most of the stuff you typically see today looks like it could be from the era of Sherlock Holmes" (Landscape Architect). One participant identified that many of the typical pieces that we currently understand as urban furniture have been created through unconscious design – meaning that pieces have been merely built based on material availability and production line constraints. This scenario has resulted in the constrained genre of urban furniture that the public currently knows and accepts.

STANDARD VS. SIGNATURE

Experts from both design and administration points of view exposed the council's predilection toward design standardization. "The city likes standard furniture" (Landscape Architect). Participants representing the council explained that consistency in urban furniture across an entire cityscape is advantageous because maintenance can be facilitated and materials easily replaced. From an administration standpoint, a standard and unified suite of city-wide urban furniture can benefit from 'economies of scale.' These factors led to discussions around the issue of budgets. Some participants expressed frustration with their own failed attempts to create innovative urban furniture design in which the furniture is often the first to be eliminated or stifled by a constrained budget.

For those participants representing design practice, working on public space projects was described as a "conservative process" - a process where attempts to create "signature" innovative urban furniture components are often stifled by conservative budgets and skeptical public authorities. In general, a consensus of participant feedback illuminated the multi-faceted

constraints that make designing for public spaces a challenging task. Yet, in light of these constraints, one participant stressed that "it is the designer's duty to do something special" despite the council's skepticism and the potential for public criticism.

Evaluation: The Hub on the Harbour

GENERAL IMPRESSIONS

In general, the majority of participants responded favorably to the concept of an outdoor working station and the design of The Hub. In particular, participants who were familiar with the context in which The Hub was being proposed (Auckland City's Waterfront Harbour District) viewed the conceptual design as a good fit and/or addition to the developing Harbour urbanscape. Expert interviews exposed the city's interest in "de-cluttering" public spaces. Hence, the proposition for combining outdoor product design elements such as railings, tables, and seats, was seen as desirable. "Keeping the walk space open" was identified as a beneficial attribute by one participant.

ALTERED ERGONOMICS

The concept of standing and/or leaning in public spaces as an alternative to sitting was also identified as a positive trait of the design – one participant adding that the current cultural shift towards improving personal health and fitness would benefit this concept. In general, participants revealed a pre-existing paradigm governing their notions about urban furniture – one primarily constrained to the activity of sitting. Therefore, to propose standing, leaning, and other alternative positions for user-orientation was identified as fresh thinking. One participant explained that if the angles and proportions were indeed ergonomically correct (i.e. 135º for leaning), a user could lean quite comfortably all day if they wanted. And the ability to move and shift and change positions was also seen as benefit. One concern was raised regarding the limitations of the design's "fixed seating" in which the proportions might only appropriately fit one body type – a problematic issue in public spaces where equal access is considered crucial.

MATERIAL APPLICATION

The proposed material for The Hub - sheet metal (aluminum or steel) - provoked many questions about what constitutes an appropriate materials palette for the outdoors. Participants offered mixed reactions to the primary use of steel - some concerned that metal might be too hot or cold or even dangerous. Others saw weathered steel as an advantageous material based on its durability and ease of maintenance. Through this discussion, it became evident that natural materials, such as wood, were regarded as the best materials to work with in a public setting.

INSTALLATION

Participants expressed admiration for The Hub's application of a "kit of parts" – a feature that enables a variety of installation options and facilitates component replacement. It was suggested that the parts could be installed at different locations throughout the city with varying frequency and perhaps seasonally moved. Discussions of installation led many participants to point out the unresolved status of the design's hardware and installation detailing, and noted that resolving these details would be key to successful implementation.

Figure 9.1 The Hub on the Harbour presentation material that was shown to experts

WORKING OUTDOORS

In discussions about The Hub's intention to support outdoor working conditions, participants concurred that user-comfort was an essential condition necessary in supporting elongated lengths of time spent outdoors. "The seat would have to be comfy, be a nice material, perhaps follow the contours of the body" (Council Urban Designer). A few of the issues raised that might affect comfort in this instance were dust and dirt, shade and shelter, and seasonal weather protection from heat, wind, water, and cold. It was suggested that being able to "personalize the shade" might be a favorable addition to the design concept, and that the power-plug and WiFi access were not crucial components in these technologically advanced times.

One participant overtly questioned the underlying assumption that people need and/or would use a furniture peice to 'work' outdoors. The underlying concept of this design conflicted with this participant's view that public spaces are places where people go to "retreat and seek refuge from regular life." The design was viewed as a potentially viable addition to public space, but in a manner that it might support more "casual meetings" rather than specific office work. Another participant noted that providing an alternative atmosphere for office workers was a worthy cause, but wondered what it would take to signify the kind of specific activity that was desired – proposing that it could be as simple as a sign that reads "Work here."

CONTEXT SENSITIVITY

In general, all participants reiterated the importance urban furniture design that responds to a given urban context, and agreed that The Hub achieved this end. Participants could envision The Hub as a successful component of public space infrastructure as long as its location was strategically selected. Some suggested that they could see design working in alternative locations to the Harbour as well. The distinctiveness and innovation of the design was seen as an asset that could impart on a public space a "unique marketable difference." Though, participants advised caution, explaining that from a public authority's standpoint, project success would be primarily measured against issues of maintenance, liability, mobility, function, and safety.

Evaluation: The Buttress

GENERAL IMPRESSIONS

Overall, participants were impressed with The Buttress' form factor, and commented favorably about its style and design. The use of bright vivid color was commended by a number of participants, and cited as a positive quality especially in the context of an otherwise monochromatic urban setting. The "organic look and style" was also highlighted as a favorable attribute, garnering a reaction from one participant calling it "quirky." An expansion of the piece into a "suite" of several related pieces (a product range) was recommended by one participant upon seeing the concept.

SOCIABILITY

All participants expressed a general consensus that promoting social interaction in public spaces, part of the design's aim, should be a central objective of most urban furniture projects. And a majority of the participants presumed that The Buttress would indeed successfully facilitate sociability, but only if issues of maintenance and barriers to implementation could be successfully navigated.

Figure 9.2 The Buttress presentation material that was shown to experts
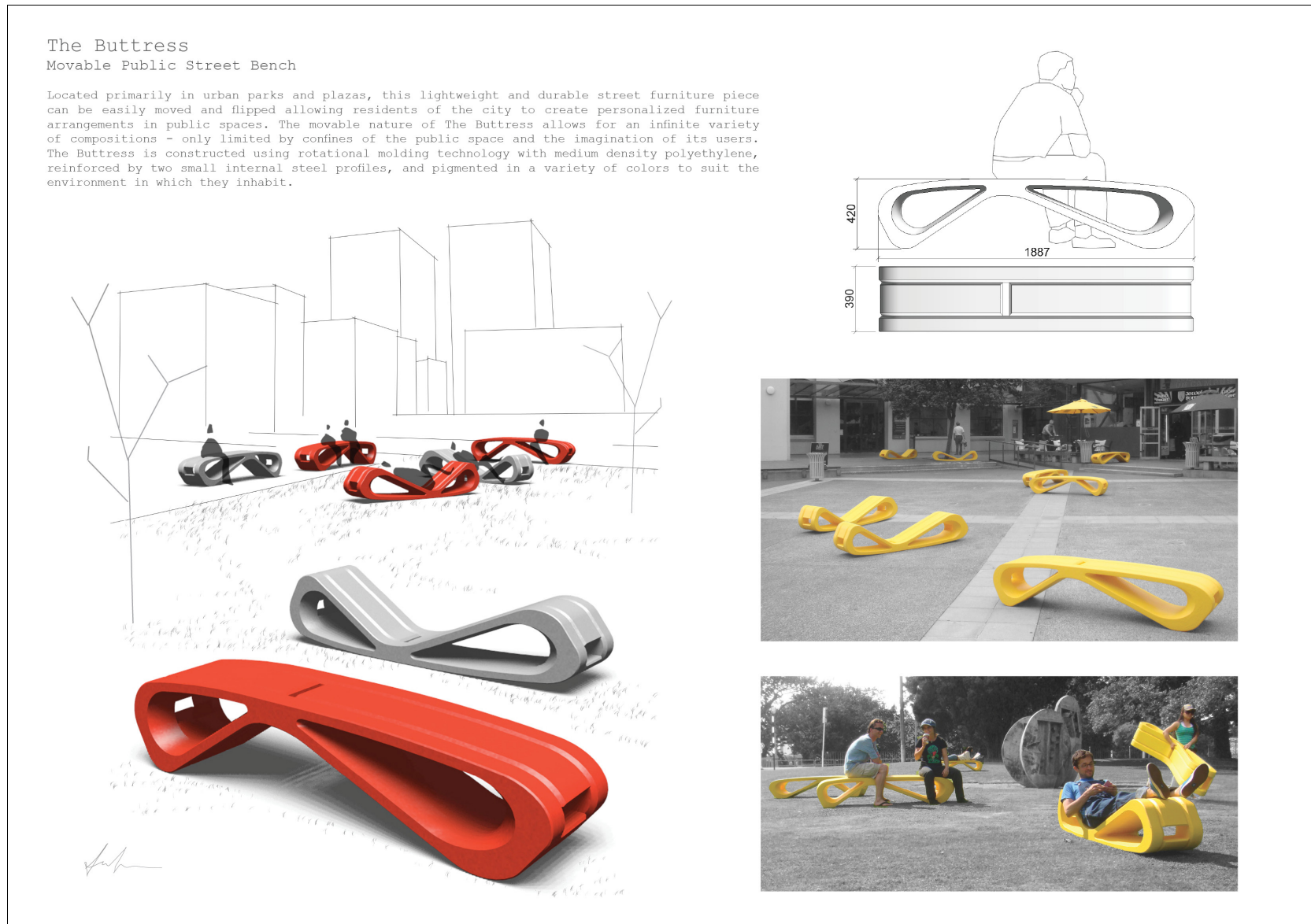
THEFT AND VANDALISM

All participants agreed that the potential for these objects to get stolen was of primary concern. Some suggested that the movability of the objects would afford vandalism (alluding to the unruly crowds that tend to populate Auckland's downtown on weekend nights). Although these issues were raised as a chief stumbling block towards successful implementation, participants were quick to offer solutions. Many participants recommended fixing The Buttress (temporarily or permanently) to the ground in an organic clustered fashion, giving it a "sense of flexibility;" or in other words "tricking people" to perceive it as movable. Other recommended solutions included "tethering" The Buttress to a fixed point, weighing it down with water or sand, and/or storing it indoors at night.

MATERIAL APPLICATION

The application of rotationally-molded Polyethylene plastic as a primary material received mixed criticism from participants. One participant's own experience with rotational molding large products revealed the practical difficulty in achieving an even application and consistency of the plastic along large flat surfaces (an effect of the liquid plastic forming process). It was recommended that making detailed revisions to The Buttress form would garner better results through the rotational molding process. Other participants were not as familiar with Polyethylene plastic as an outdoor furniture material, but indicated that the material would have to be a robust composition similar to the type of plastic used for playground furniture.

Interestingly, it was participants representing an administration perspective who suggested that urban furniture designs with a "3-5 year life span" are completely acceptable. In this case, the brightly colored plastic material (proposed for The Buttress) was seen as fresh and interesting, and the object itself was viewed as a signature element that could temporarily occupy a given space, not needing to be a permanent fixture. Discussions with representatives from council exposed an evolved perspective on public space in which value is placed on elements that can constantly change to keep the spaces "fresh." "Public space shouldn't be static" (Council Urban Designer).

MOVABILITY / FLEXIBILITY

"Flexibility is good but difficult" (Landscape Architect). This was a common sentiment shared by most participants. Flexible and movable elements were expressed as very desirable qualities for public spaces, yet participants revealed a collective incapacity to successfully execute them. A common view was conveyed that multi-functionalism in public design is beneficial - one participant advocating that multi-functional attributes leave the design "free for interpretation." Objects and spaces that can be freely interpreted can be fun, playful, and especially "good for kids." Yet an issue was raised around the conflicts that arise when one's interpretation of a public object obstructs another's. The classic example given was that of skateboarders and their use of public benches, hand railings, and ledges as skateboarding obstacles. Generally speaking, all participants agreed that an activity like skateboarding was usually a positive contribution to the life of public spaces, but in many cases, the skateboarder's "free interpretation" of urban furniture was damaging to the furniture itself – rendering the pieces un-usable to the rest of the population.

Participants representing the council expressed sincere commitment to the "sociability of public spaces, activity, and getting outside," yet they also expressed difficulty in effectively reconciling competing interests and activities. Scenarios such as skateboarding that instigate issues of "liability, territoriality, and damage" can lead to irreconcilable conflicts that tend to result in retrofitting a space to purge it of unwanted activity. These kinds of realities have led the city to unique perspectives about how design needs to perform – stating, as an example, that urban furniture elements need to be designed for extreme events. Because there is an operational separation between the design and maintenance of public spaces, these kind of lessons learned about extreme use and typical public behavior by the city do not always cycle back into the design process.

Conclusions

Through the myriad of professional and anecdotal accounts presented in these expert interviews, a collective story emerged around the complicated reality of balancing public space user-needs with issues of maintenance, perceived safety, and public decision-making. In order to achieve this project's objective of activating public space through innovative urban furniture, these issues would have to be clearly addressed through a foundation of user-research and design concept testing.

Overall, feedback regarding the presented design concepts was positive and encouraging. In most cases, participants viewed the objectives of each design as a valuable addition to public space, and could understand how a process of human-centered design research might offer deeper insight for designing user-

oriented public space. Some participants were even inspired by the presented work, admitting that an approach to public space design centered on urban furniture could be new and interesting, and particularly innovative from a landscape architecture perspective. Conducting expert interviews at this final stage of the study, in which the project's innovations could be presented, proved to be an invaluable method for inspiring a broader conversation about pro-active public design. The discourse may have been less fruitful had the concepts been absent from the discussion.

Through interviews, research (and in particular human-centered research) was not revealed to be a necessarily strong component of typical public space design development. Although apparently necessary, participants from both public and private disciplines did not seem to hold either the budget capacity or the authority to conduct front-end user-oriented research to potentially inform design development. However, all participants exhibited an abundance of knowledge acquired from many years of practice concerning what constitutes successful design and were able to impart that knowledge through this evaluation.

Regarding design - factors of material durability, implementation, and maintenance, comprised the majority of participant criticism – factors that would most certainly be the focus of further investigation and design development. Unfortunately, the scope of this study did not allow for the full material testing and practical resolution of design concepts before presenting concepts to experts. Yet, it seemed evident that design concepts were articulated and understood in a clear manner that enabled an insightful discussion around introducing innovation, and the practical requisites for doing so successfully.

10. Discussion

Overview

The role of product design in activating public spaces is a relatively under researched area within the discipline of public space design. As a result, the potential for better addressing public user-needs through innovation using human-centered design has been largely unexplored. The primary objective of the Public-Object Nexus project was to investigate how the design of public urban furniture can be enhanced, to more effectively support an active and dynamic public lifestyle. The project sought to reposition the emphasis of public urban design from a macro to a micro level focus, so that user needs and desires might be more effectively addressed.

The project was underpinned by passive observations of urban public spaces, which were analyzed in the context of a number of design theories, resulting in the development of an open-affordances conceptual design framework. Evaluation and refinement of this conceptual framework was achieved through the design and development of three urban furniture proposals, personal reflection, and the subsequent use of experts for detailed evaluation.

The triangulation of human-centered research, design-practice, and expert interviews has allowed considerable progress towards the understanding of the potential of open-affordances and how a human-centered approach to public space development might lead to more meaningful design. The

research and design processes that were undertaken through this research project have identified a variety of issues and opportunities discussed as follows.

Key Conclusions

- **OPEN-AFFORDANCES CRITIQUE**

The open-affordances design framework, developed in this research project, represents an evolution in addressing the objective to more effectively support an active and dynamic public lifestyle. Early design projects were focused on specific user-activities, and how enhanced human-factors in urban furniture design might reinforce said activities. However, as parallel research efforts progressed, the unpredictable nature of public spaces and user-behavior became apparent. The remarkable and inherent diversity of public activity and user-predilection was eventually acknowledged by the researcher, which made designing for specific, predetermined activity futile. Therefore, open-ended interpretation and flexibility in design were introduced as essential attributes to a design framework that would promote choice and autonomous interaction with urban furniture.

The fully developed open-affordances framework was used to underpin The Buttress bench design development, in which flexibility and interactivity were guiding features. The final Buttress prototype performed well, and was effective in representing the full intent of open-affordances in the focus group and expert evaluations. Opinions about The Buttress were generally favorable, and excitement was expressed around the playfulness and freedom of possibilities it implied.

The evaluation of The Buttress also provoked discussion around the challenges that might face implementing open-affordances design. Many prevailing perceptions about urban furniture revolve around issues of vandalism, vagrancy, and other undesirable activities that are often associated with public spaces, and these perceptions underscore many of the design decisions that go into creating urban furniture. The result is a series of static, uninspiring pieces that were built under the premise of withstanding worst-case scenarios. Implementing an alternative approach to design, such as open-affordances, implies a paradigm shift in which design decisions must be based on best-case scenarios rather than worst.

Through priorities focused on enabling action possibilities instead of preventing them, it is probable that public spaces could offer much more wide-ranging appeal to larger groups of users. The simple *presence* of people is the most basic and fundamental deterrent to undesirable activity, and through a focus on flexible, dynamic, and socially supportive design, this presence could be

enhanced. The question that arises is, who has the authority to enact this kind of shift in public design priority?

- **THE REQUISITE TO ACKNOWLEDGE STAKEHOLDER INFLUENCE**

The process of attaining an expert evaluation for The Hub and Buttress design concepts illuminated the wider sphere of challenges and divergent agendas that ultimately influence the provision of urban furniture in public spaces. A foremost complication lies with the various stakeholders who inevitably decide what is built in the public – a complication that was highlighted through expert interviews. City officials, designers, administrators, maintenance workers, etc. comprise just some of the multifarious influences that determine what is appropriate for public spaces. Whereas, those who are being designed *for*, the users, rarely have much impact on the design and implementation of public provisions. A major barrier to accommodating user-needs through public design is that the *purchaser* is often not the *user*. The purchasing department (the City) more often chooses amenities based on factors of price, relationship with the supplier, and maintainability (Norman, 1998).

The incentive to *innovate* through design and increase user-satisfaction is less prominent in the public domain because the products of design do not have to compete in the marketplace for market share. Due to the fact that users are not purchasing

urban furniture directly, their needs, desires, and preferences are not reflected in design decisions that would, in a normal market context, drive design innovations.

Evidently, designers and developers of public spaces are obliged to speculate and/or guess what will be appropriate and meaningful for users. Yet, the large-scale logistical and political complications involved with developing public spaces appear to overshadow the human-centered considerations in design. This apparent inadequacy in responding to dynamic human needs and proclivities leads to underused and under-loved spaces, and often the need for retrofitting spaces because actual human activity was not a central consideration.

From an administration point of view, expert interviews affirmed that the responsibility of administrators is to deliver successful public spaces that are safe and functional for users. Representatives from the city expressed a desire to impart human-centered qualities for all public projects, and responded positively to the idea of infusing open-affordances into public design. In essence, the administrators were represented as 'champions' for user causes such as functionality, safety, and human-factors. However, the city and its administrators are mostly only able to affect the physical design of urban furniture through a review capacity. In terms of design development, they are dependant on designers to drive innovation.

Conversely, the designers of public spaces do not traditionally place a principal emphasis on the functionality of the human-scale. Rather, designers (usually landscape architects and urban designers) have been known to give more focus to the macro-scale, often designing from a birds-eye perspective, with an emphasis on conceptual visual qualities, or "design for design's sake". This scenario, which can be partly attributed to the general tradition of landscape architecture and urban design training, highlights a gap in the profession in terms of designing for user-needs. Human-scaled elements, such as the genre of urban furniture, sit between disciplines (i.e. no profession really 'owns' them), and therefore, driving human-centered urban furniture innovation is evidently not a priority. This situation frames the need to incorporate human-centered design professionals into the public design process, and reorient development priorities towards more effectively addressing user-needs.

· THE IMPORTANCE OF INTENTIONS

This study employed human-centered design (HCD) as an alternative approach to the typical processes of macro-level planning and design of public space. The objective was to create more user-oriented and socially conducive design that would elevate active participation and interaction in public spaces, with the additional benefit of maximizing the city's financial investment

in micro infrastructure. Utilizing a HCD approach involved an array of mixed research and design methods - a primary method being passive observations. Within HCD, Suri (2005) defines 'observations' as a method for understanding for what people do intuitively, which can then be used to inform a design that will more effectively elicit the intended user-response.

The caveat with the HCD approach, as revealed through this study, is that the *intended user-response* must be defined at some initial stage before a design process commences. Because HCD is primarily a process, it doesn't offer much in the realm of stated values or intentions for the human condition, fundamental human needs, or ideal standards of living. The process, instead, requires the designer to insert an interpretation of values or intentions that can bridge the gap between existing circumstances and new desirable design proposals.

Although human-centered methods, such as observations, can be very effective in revealing the current (albeit, sometimes idiosyncratic) state of design and user-behavior, it is up to designer and client discretion to determine how to respond. For instance, a city might observe that people are sleeping in one of its plazas. A number of actions could be taken to respond to this observation in terms of either reinforcing the activity, or preventing it. The appropriate response ultimately depends on the predetermined set of values that the city upholds, and these values drive intentions that then drive design outcomes.

Undertaking a human-centered design process elucidated the key role that initial intentions and/or objectives play in underpinning a design process. Without clearly stated intentions and objectives for design, and/or the development of a proactive vision for improved urban living, design outcomes run the risk of replicating the status quo (Manzini, 2008).

Bringing HCD to Public Design

Although preliminary in nature, the design concepts developed through this study demonstrated how public design outcomes can benefit from a framework of front-end human-centered research, as evidenced by the favorable response conveyed by potential users and industry experts to this study's design concepts. A human-centered approach incorporates a process that is iterative and ultimately more apt to achieve meaningful user-oriented design outcomes. The application of open-affordances represents a design framework that is specifically tailored to infuse these kinds of human-centered considerations into public spaces:

Iterative, not static: Traditionally, public spaces have been developed as static memorials in time, where built work is developed to serve as a 'legacy' for the community. Expert interviews indicated a slight departure from this traditional thinking, in which a desire was expressed to reorient public spaces as places of dynamic interactivity. However, in order to achieve this purported paradigm shift for design, an evolved process of appealing to the dynamic needs of users has to become central.

As part of an iterative research and design process, initial research at the front-end, and evaluation methods at the back-end are essential. Whyte (1980) explains that, although not typical, methods of experimentation, testing, evaluation could vastly improve the iterative development of public space design over time. Proposed here is the permeation of design research, steeped in human consideration, into the discipline of public design.

Enabling, not inhibiting: As typical urban furniture design is often static, it can also be considered sometimes preventative in nature. As an alternative, the open-affordances framework proposes design that highlights human potential, or what is possible for people to do in public spaces. Flexible elements that imbue human comfort and pleasure and support a wide range of activity should be advanced through provisions of public design.

By maximizing the functional and pleasurable potential of products in public spaces through open-affordances, the demand for privatized goods can be reduced while at the same time fostering new forms of socialization (Manzini & Jegou, 2003). New and improved visions for what the public can provide for its people can help break down the predominance of private culture and strengthen the social ties that bind a healthy community.

References

American Public Transportation Association (APTA). (2010). *Public transportation: Moving America forward.* Washington D.C.: Author.

Baur, R. (2008). Civic space and design. In Erlhoff, M., Heidkamp, P., & Utikal, I. (Eds.), *Designing public: Perspectives for the public* (pp. 96-100). Basel: Birkhauser.

Bayer, D. (2008). Behavior in public spaces. In Erlhoff, M., Heidkamp, P., & Utikal, I. (Eds.), *Designing public: Perspectives for the public* (pp. 160-163). Basel: Birkhauser.

Bieling, M. (2008). Location specific design of street furniture. In Erlhoff, M., Heidkamp, P., & Utikal, I. (Eds.), *Designing public: Perspectives for the public* (pp. 105-110). Basel: Birkhauser.

Bounds, M. (2003). *Urban social theory: City, self, and society.* South Melbourne: Oxford University Press.

Brandes, U. (2008). The private public and the public private. In Erlhoff, M., Heidkamp, P., & Utikal, I. (Eds.), *Designing public: Perspectives for the public* (192-195). Basel: Birkhauser.

Broto, C., & Krauel, J. (2010). *Urban furniture selection.* Barcelona, Spain: Links Books.

Brown, T. (2009). *Change by design: How design thinking transforms organizations and inspires innovation.* New York, N.Y.: Harper Collins.

Buchanan, R. (2004). Human-centered design: changing perspectives on design education in the East and West. *Design Issues*, 20(1), 30-39.

Buzan, T. (1993). *The mind map book*. London :BBC Books.

Carr, S., Francis, M., Rivlin, L., & Stone, A. (1992). *Public space.* New York, N.Y.: Cambridge University Press.

Centre for Design Innovation (CDI). (2009). *User-centered card pack*. Retrieved April 27, 2009, from http://www.designinnovation.ie/how.html

Chapman, J. (2005). *Emotionally durable design*. London: Earthscan.

Cities: The urban equation. (2010). *Nature*, 467(899). doi: 10.1038/467899a

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks: Sage.

Deasy, C. M. (1985). *Designing places for people: A handbook on human behavior for architects, designers, and facility managers*. New York, N.Y.: Whitney
        Library of Design.

Dell, C. (2008). Improvisation on the urban. In Erlhoff, M., Heidkamp, P., & Utikal, I. (Eds.), *Designing public: Perspectives for the public* (182-188). Basel:
        Birkhauser.

Dewalt, K. M., & Dewalt B. R. (2011). *Participant observation: A guide for fieldworkers* (2nd ed.). Lanham, Maryland: Alta Mira Press.

Dorka, M. (2008). Design of the public. In Erlhoff, M., Heidkamp, P., & Utikal, I. (Eds.), *Designing public: Perspectives for the public* (43-46). Basel:
        Birkhauser.

Dresner, S. (2002). *The principles of sustainability. London*: Earthscan.

Drucker, M. (2010). *The fundamental attribution error in transportation choice*. Retreived from http://psystenance.com/2010/03/15/the-fundamental-
        attribution-error-in-transportation-choice/

Edmonds, H. (2001). *Focus group principles*. Retrieved from http://web.archive.org/web/20041026140011/http://www.marketingpower.com/content1293.php

Engwicht, D. (1999). S*treet Reclaiming: Creating livable streets and vibrant communities*. Canada: New Society.

Erlhoff, M., Heidkamp, P., & Utikal, I. (Eds.). (2008). *Designing public: Perspectives for the public*. Basel: Birkhauser.

Fabricant, R. (n.d.). As consumers' demands change, designers are all in the behavior business. *Fast Company*. Retrieved June 2, 2009, from http://www.

Fastcompany.com/blog/robert-fabricant/design-4-impact/consumers-demands-change-designers-are-all-behavior-business

Farr, D. (2008). *Sustainable urbanism: Urban design with nature.* Hoboken, N.J.: Wiley.

Fukasawa, N., & Morrison, J. (2007). *Super normal: Sensations of the ordinary.* Baden, Switzerland: Lars Müller Publishers.

Fukasawa, N. (2010). *Muji: Product design of Muji.* New York, N.Y.: Rizzoli International.

Gehl, J. (2005). *Public Spaces and Public Life Study -* City of Wellington: 2005, Wellington City Council, Wellington, New Zealand

Gibson, E. J. (1982). The concept of affordances in development: The renaissance of functionalism. In Collins, W. A. (Ed.), *The concept of development* (pp. 55-68). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Gibson, J.J. (1979). *The ecological approach to visual perception.* Boston: Houghton Mifflin.

Gray, C., & Malins, J. (2004). *Visualizing research: A guide to the research process in art and design.* Great Britain: MPG Books.

Greenhouse, E.S. (2011). *Livable New York Resource Manual.* New York State Office for the Aging. Retrieved from http://www.aging.ny.gov/LivableNY/ResourceManual/Index.cfm

Hanington, B. (2003). Methods in the making: A perspective on the state of human research in design. *Design Issues,*19(4), 9-18. doi: 10.1162/074793603322545019

Hesse-Biber, S. N., & Leavy, P. (2006). *The practice of qualitative research.* London: Sage.

IDEO. (2003). *IDEO Method cards* [activity card]. San Francisco: William Stout Architectural Books.

IDEO. (2010). *Human-centered design toolkit.* Retrieved from http://www.ideo.com/work/human-centered-design-toolkit/

Ireland, C. (2003). Qualitative methods: From boring to brilliant. In Laurel, B. (Ed.), *Design research: Methods and perspectives* (pp. 23-29). Cambridge,

Massachusetts: MIT Press.

Johnson, B.M. (2003). The paradox of design research. In Laurel, B. (Ed.), *Design research: Methods and perspectives* (pp. 39-40). Cambridge, Massachusetts: MIT Press.

Jones, C. J. (1992). *Design methods* (2nd ed.). New York, N.Y.: Van Nostrand Reinhold.

Jordan, P. W. (2000). *Designing pleasurable products: An introduction to the new human factors*. London: Taylor and Francis Books.

Jorgensen, D. L. (1989). *Participant observation: A methodology for human studies.* London: Sage.

Julier, G. (2000). *The culture of design.* London: Sage.

Karni, R., & Shalev, S. (2004). Fostering innovation in conceptual product design through ideation. *Information Knowledge Systems Management,* 4(1), 15-33.

Kelley, T., & Littman, J. (2001). *The art of innovation: Lessons in creativity from IDEO, America's leading design firm*. New York, N.Y.: Random House.

Kemp, E. (2001). Observing practice as participant observation – linking theory to practice. *Social Work Education,* 20(5), 527-538. doi: 10.1080/02615470120072823

Kent, F. (2000). *How to turn a place around: A handbook for creating successful public spaces.* New York, N.Y.: Project for Public Spaces.

Kolb, B. (2008). *Marketing research: A practical approach*. Californita: Sage.

Krippendorff, K. (2006). *A semantic turn.* Boca Raton, Florida: CRC Press.

Laurel, B. (Ed.). (2003). *Design research: Methods and perspectives*. Cambridge, Massachusetts: MIT Press.

L'Aoustet, O., & Griffet, J. (2004). Sharing public space: Youth experience and socialization in Marseille's Borely Park. *Space and Culture,* 7(2), 173-187. doi:

10.1177/1206331203254041.

Long, F. (2009). Real or imaginary: The effectiveness of using personas in product design. *Irish Ergonomics Review:* Proceedings of the Irish Ergonomics Society Annual Conference 2009. Dublin, Ireland: Irish Ergonomics Society.

Lunenfeld, P. (2003). The Design Cluster. In Laurel, B. (Ed.), *Design research: Methods and perspectives* (pp. 10-16). Cambridge, Massachusetts: MIT Press.

Mackenzie, N. & Knipe, S. (2006). Research dilemmas: Paradigms, methods and methodology. *Charles Sturt University Issues in Education Research,* 16(2), 193-205.

Manzini, E., Walker, S., & Wylant, B. (2008). *Enabling solutions for sustainable living: A workshop.* Calgary, Canada: University of Calgary Press.

Manzini, E., & Jegou, F. (2003). *Sustainable everyday: Scenarios of urban life.* Milan: Edzioni Ambient.

McIntosh, P. (2010). *Action research and reflective practice: Creative and visual methods to facilitate reflection and learning.* London; New York: Routledge.

Nemteh, C. P. (2004). *Human factors methods for design: Making systems human-centered.* Boca Raton, Florida: CRC Press.

Norman, D. (1998). *The design of everyday things.* New York, N.Y.: Basic Books.

Norman, D. (2004) *Emotional design: Why we love (or hate) everyday things.* New York, N.Y.: Basic Books

Norman, D. (2004). Affordances and design. Retrieved from http://www.jnd.org/dn.mss/affordances_and.html

Norman, D. (2005). Human-centered design considered harmful. *Interactions,* 12(4), 14-19. New York, N.Y.: Association for Computing Machinery.

Oldenburg, Ray. (1991). *The great good place.* New York: Marlowe & Company.

Owen, N., & Sparling, P. B. (2010). Sedentary behavior: Emerging evidence for a new health risk. *Mayo Clinic Proceedings,* Dec2010, 85(12), 1138-1141. doi:10.4065/mcp.2010.0444

Pilloton, E. (2009). *Design revolution: 1000 products that empower people.* New York, N.Y.: Metropolis Books.

Pheasant, S. (2006). *Bodyspace: anthropometry, ergonomics, and the design of work.* Stephen Pheasant and Christine M. Haslegrave (3rd ed.). Boca Raton: Taylor & Francis.

Plowman, T. (2003). Ethnography and critical design practice. In Laurel, B. (Ed.), *Design research: Methods and perspectives* (pp. 30-38). Cambridge, Massachusetts: MIT Press.

Project for Public Spaces, Inc. (PPS). (2000). *How to turn a place around: A handbook for creating successful public spaces.* New York, N.Y.: Author.

Project for Public Spaces, Inc. (PPS). (2010). Building community through transportation. Retrieved from: http://www.pps.org/articles/buildingcommunitythroughtransportationintro/

Rhea, D. (2003). Bringing clarity to the "fuzzy front end." In Laurel, B. (Ed.), *Design research: Methods and perspectives* (pp. 145-154). Cambridge, Massachusetts: MIT Press.

Ridley, D. (2008). *The literature review: A step-by-step guide for students.* London: Sage.

Rouse, W. B. (2007). *People and organizations: Explorations of human-centered design.* Hoboken, New Jersey: John Wiley & Sons.

Saurí, D., Pares, M., & Domene, E. (2009). Changing conceptions of sustainability in Barcelona's public parks. *Geographical Review*, 99(1), 23(14).

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York, N.Y.: Basic Books.

Siu, M. K. W. (2005). *Pleasurable products: Public space furniture with userfitness.* Journal of Engineering Design 16(6), 545-555.

Siu, M. K. W., & Wan, P.H. (2009). Street furniture design principles: Unity and identity. *Design Principles and Practices: An International Journal.* 3(1), 395-424.

Siu, M. K. W. (2009). Public design for changing urban needs. Hong Kong Polytechnic University. Hong Kong. SAR

Siu, M. K.W. (2010). Building a flexible public environment. Hong Kong Engineer. Retrieved from

http://www.hkengineer.org.hk/program/home/article.php?aid=5127&volid=115

Smith, R. E. (2010). Functional criteria to consider when designing a bus stop. Salt Lake City, Utah: University of Utah, College of Architecture and
        Planning.

ST&P, Attorneys and Agents. (2010). *Designs Law*. Retrieved from http://www.stplegal.com/service_details.php?id=5

Suri, J. F. (2005). *Thoughtless acts? Observations on intuitive design*. San Francisco: Chronicle Books.

Swann, C. (2002). Action Research and the Practice of Design. *Design Issues*, 18(2). Chicago: University of Illinois.

Taylor, S. J., & Bogdan, R. (1998). *Introduction to qualitative research methods: A guidebook and resource* (3rd ed.). New York, N.Y.: Wiley.

Utterback, J., Vedin, B., & Alvarez, E. (2006). *Design-inspired innovation*. Hackensack, New Jersey: World Scientific.

Verganti, R. (2009). *Design driven innovation: Changing the rules of competition by radically innovating what things mean*. Boston, Massachusetts: Harvard
        Business Press.

Walker, R. (2008). *Buying in: The secret dialogue between what we buy and who we are.* New York, N.Y.: Random House

Walsh, M. (2009). *Futuretainment.* London: Phaidon Press.

Whyte, W. H. (1980). *The social life of small urban spaces.* Ann Arbor, Michigan: Project for Public Spaces.