

Evidence-based design:

Structured approaches in leading landscape architecture practice

by

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Abstract

Landscape architecture is embarking on a new design frontier, one where its practitioners are increasingly being asked by clients to design using credible evidence and to ensure design performance. As design disciplines follow in the footsteps of other evidence-based practices, like medicine and engineering, landscape architecture is poised to become a more scholarly profession – a profession of evidence-based landscape architecture. Evidence-based landscape architecture was first coined and defined in 2011 by Brown and Corry as “the deliberate and explicit use of scholarly evidence in making decisions about the use and shaping of land” (Brown and Corry 2011, 328). Current literature explains the benefits of practicing evidence-based design (EBD). These include ensuring design performance, justifying client investment, quantifying the value of design, systematically managing complex projects, marketing the firm to clients, attracting the most innovative designers to the firm, and adding to the knowledge base of the landscape architecture field. However, little is known about how landscape architecture firms are engaging evidence-based design in daily practice. This thesis examines how four leading landscape architecture firms (Design Workshop, Mithun, Sasaki Associates, and OLIN) have developed unique EBD approaches to integrate, apply, and propagate evidence-based design in professional practice.

In order to study and analyze the four firms’ EBD approaches, individual comprehensive case studies were conducted. Qualitative data was collected through: focused interviews with directors and leaders of evidence-based design at each firm; casual observations made during office visits; and, a review of firm literature. A case study framework for EBD approaches in professional practice was developed based on discussion topics that consistently emerged from the interviews. The framework was used to organize, analyze, and present the findings into four major themes. A cross-case analysis was conducted to compare the development, implementation, and effects of EBD approaches at each firm.

Findings reveal that each firm has developed an EBD approach to meet the need for engaging complex problems and meeting increasing client expectations for performance. While each firm’s EBD approach is unique, similarities and characteristics emerged between the case studies. The most consistent factors identified across cases include: having academic founders of the firm; the implementation of EBD- or research-specific roles and responsibilities; the creation of tools to organize and understand data; cultivating design cultures to support the EBD approach vision; the communication and transparency of relationships with clients and consultants; and, the reporting of findings for the advancement of the profession. Although any landscape architecture firm is likely to employ at least one of these concepts, the developed integration, application, and propagation of a majority of these concepts is what makes these firms unique and successful in applying EBD in professional practice. It was also found that the design processes themselves vary dramatically across the firms. EBD in practice is therefore not prescriptive and does not always look the same. The findings and case study framework developed in the study are useful primarily for landscape architecture firms looking to develop, integrate, apply, and propagate their own EBD approach.

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To Dad - thank you for my strength.

Preface

I committed to the thesis route in the Fall of 2011. I chose this path because it offered, to me, a challenging opportunity. After multiple failed topic investigations, I attended the 2012 ASLA conference in Phoenix. While attending a session entitled, "Assessing the Performance of Landscape Projects", I wondered, how are these firms making this process profitable? This ultimately influenced my thesis topic.

Between the Fall of 2011 and Fall 2012, I was the student research assistant on the academic team for Landscape Architecture Foundation (LAF)'s Landscape Performance Series (LPS) Case Study Investigation (CSI). My major professor, Jessica Canfield, and I documented and presented two case studies to be published on the LPS website, one of which was the Blue Hole Regional Park in Austin, Texas by Design Workshop. This began my interest in performance evaluations and designing for performance. A seminar study I did that following year in school evaluated four LAF case studies on their framework, range, metrics, and presentation of a project evaluation. During the summer of 2012, I also interned with Design Workshop where I was exposed to their use of the Metrics Matrix (now called the Sustainability Matrix), the firm organization, and design culture that developed as a result of and supported their DW Legacy Design® initiative.

Having a thesis proposal in place, I traveled around the country to the four firms' offices to conduct interviews during the summer of 2013,

In the fall of 2013, I accepted a position with Davis Partnership Architects in Denver. Throughout my three years there, I worked alongside the in-house researcher, Melissa Piatkowski, to advance and implement research at the multi-disciplinary firm. I was a member, a co-leader, and then the sole leader of the Evidence-Based Design Focus Group which aimed to ignite conversation about EBD, share lessons learned, and implement an action plan to incorporate EBD into practice. Davis, who struggled to find the balance of EBD, became an informal baseline on which to evaluate the four firms in my thesis.

I worked on the thesis production for three years. While wrapping up in 2016, I attended the ASLA annual meeting in New Orleans. Listening to various education sessions, I noted that, in just three short years, the profession had already evolved since my 2013 investigation. There was more talk about academic collaboration, more discussion of the role professional organizations play in the dissemination of credible information, and there were perhaps more firms that might have been included in the study had I started it in 2016.

Introduction & Background

Introduction

Landscape architecture is embarking on a new design frontier, one where practitioners are increasingly being asked by clients and society to justify design decisions and to ensure design performance: “Will this design decision provide a good return on the resources invested?” (McMinn 2013). To address this need, the use of empirical evidence to guide decision making processes is beginning to link research and design in landscape architecture. This line of inquiry and decision making is commonly referred to as Evidence-Based Design (EBD). EBD’s predecessors, medicine and engineering, have long since become evidence-based professions, requiring scientific inquiry, basic research, peer-reviewed publication, and specialized academic studies. Following these evidence-based disciplines, landscape architecture is poised to become a more scholarly profession, a profession grounded in research that enhances the process of design – a profession of evidence-based landscape architecture.

Landscape architects are increasingly practicing evidence-based design and some private-practice firms have integrated evidence-based landscape architecture (EBLA) into their standard practices. To understand the formal approaches these leading landscape architecture firms have developed and the internal effects each has seen, one must first understand evidence itself and how landscape architects can use evidence in design practice. The evolution from evidence-based practice, a concept embraced by many disciplines; to the emergence of evidence-based design; and, finally, to discipline-specific evidence-based landscape architecture practice will also be reviewed. This review will illuminate why the application of evidence in landscape architecture is becoming more critical and how EBD provides solutions to many of the obstacles designers are seeing.

What is Evidence?

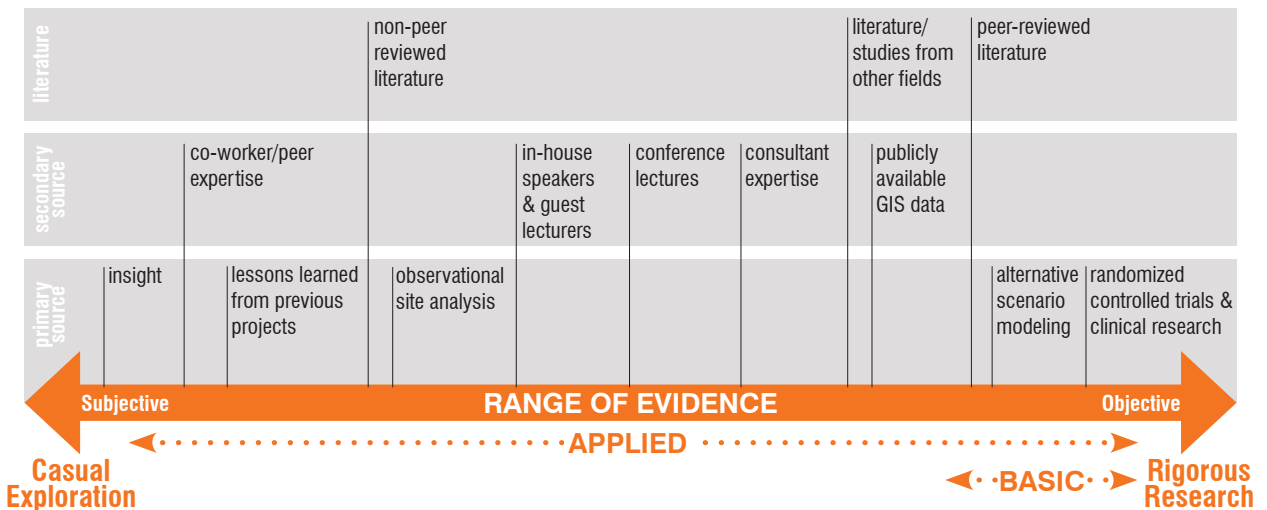
Evidence, to the design professions, is the “credible and defensible [proof] that informs design decisions” (Brandt, Chong and Martin 2010, viii). It is the “available body of facts or information indicating whether a belief or proposition is true or valid” (OED Online 1989). Landscape architects utilize evidence in two main ways: 1) to aid in making and justifying informed design decisions during the design process, and 2) to demonstrate the performance of built work. With that in mind, we can consider two types of evidence, *applied* and *basic* (also referred to as definitive or scholarly) evidence and the types of research that produce each

One major issue the design professions have in becoming more evidence-based is the artistic side of design, because art is not an evidence-based endeavor. This does not mean that designs rooted in credible research are void of art; it means that

art can be an interpretation and expression of the evidence available. Academia is slowly moving the design professions into evidence-based professions, but most established leaders at firms were not exposed to research methods or a process to utilize research while they were being educated (Hamilton 2016). For these reasons, Brandt, Chong, and Martin (2010, viii) surmise that “[designers] who like the notion [of EBD] don’t fully grasp how to assess if evidence is strong or weak, and in what contexts the evidence is valid.”

Figure 1.1 illustrates several examples of evidence that can be used in practice. Any of these can be *applied* evidence but only the closest to “Rigorous Research” can be considered *basic* evidence, or scholarly. The diagram illustrates the difference between, for instance, a randomized control trial which is objective and produced through rigorous research methods, and insight which is subjective and casual in nature. More often, practitioners will find themselves somewhere in the middle based on time, budgets, and available resources. The examples given can also range on scales of quantitative versus qualitative and context specific (answering a project-specific inquiry) versus universality (answering a thematic inquiry). The examples of evidence provided along the chart can be differentiated as primary, secondary, and literature sources. Primary sources represent first-person accounts, representing the voice of the designer himself/herself. Secondary sources function to interpret primary sources and are one step removed from the project inquiry itself. Literature is separated to show distinctions between information gleaned from a personal account or information gleaned from sources available to others – in this case published literature.

Figure 1.1
Range of Evidence
Chart (Elise Fagan)



An example of using different ways to gather evidence for one variable could be informal observation about where the most noise generates during site analysis as opposed to setting up sound meters to measure actual decibel levels around the site. This is a perceived versus actual difference. John Eberhard gives another example in his forward to *Inquiry by Design* that prompts us to think critically about the evidence we use:

Social and behavioral scientists have studied the effect of lighting on children in classrooms and almost universally report that learning improves when artificial light is reduced and daylight increased. The benefits include better grades and fewer absences (presumably correlated with enhanced learning) and improvements in student behavior as reported by teachers. But notably missing is definitive research that investigates how lighting levels correlate with cognitive functioning in children of various ages. --John Eberhard in (Zeisel 2006, 12)

The latter type of evidence, definitive evidence, also referred to as *basic* evidence, or “scholarly evidence” as Brown and Corry (2011) refer to it, is derived from academia.

For the practitioner with budget and time constraints, *basic research* might not be an appropriate use of time and funds. The question then is: what level of evidence is appropriate for a specific informed decision? And how much evidence is necessary? This is where *applied research*, and its corresponding evidence types, is useful to designers because appropriate evidence is a product of asking the right questions and is relative to the answers one seeks. If a landscape architect, for instance, inquires about a general public’s satisfaction with a park design, then a post-occupancy survey may be an appropriate method for collecting evidence. Such a study is context-specific, *applied research*, and answers a project specific question, but the findings may be difficult to apply elsewhere. On the other hand, if a researcher, whether practitioner or academic, wants to investigate what design elements trigger positive thought reactions, then a more detailed study involving neuroscience research may be appropriate. This study is context-removed, *basic research*, and the findings could apply to many projects.

Another type of *applied* knowledge is using existing published findings, often through a literature review, from within the field of landscape architecture or from related fields like ecology or sociology, to make informed design decisions. An

example of this would be using the findings from the neurological study (the *basic* research supporting a broad discovery) to make informed decisions on a specific design problem. Using existing knowledge as evidence instead of creating new knowledge or repeating experiments expedites the evidence-based design process and allows designers and their collaborators to research new questions and thus advance the field of landscape architecture.

What is Evidence-Based Practice?

Disciplines such as medicine and engineering base their practice on evidence gained through scientific inquiry. In the past century, they have transitioned to evidence-based practices, without which, doctors would still be relying on blood-letting as a cure for headaches. Over the last century, “medicine has become one of the most powerful and respected professions by embracing scholarly information, methodical record keeping, monitoring, and reporting” (Brown and Corry 2011, 328). Archie Cochrane first coined the term Evidence-Based Medicine in his 1972 book *Effectiveness and Efficiency: Random Reflections on Health Services*. David Sackett (1996, 71), said to be the father of evidence-based medicine, defines evidence-based practice as “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research.” Medicine transitioned into an evidence-based practice to ensure individual patient recovery and health, to minimize medical error, and to improve the health and wellness of whole populations.

Engineering evolved as an evidence-based profession to establish, manage, and regulate basic standards for construction that improve the safety and well-being of the people who use or occupy it. Engineering became a licensed and regulated profession long before the design professions but it is this common theme of protecting the health, safety, and welfare of people that drives the need for evidence-based practices - including the emerging evidence-based design professions.

What is Evidence-Based Design?

Evidence-based design (EBD) also emerged due to a recognizable need to enhance the health, safety, and welfare of people. EBD began in the 1980s in the field of healthcare design (The Center for Health Design 2010, 2) when design practitioners looked directly to the medical profession as a model for transitioning to evidence-based practice. The definition of evidence-based design¹ in this study derived directly from Sackett’s definition of evidence-based medicine. Evidence-

¹ Evidence-Based Design was first defined by The Center for Health design in 2008. Hamilton has worked closely with The Center for Healthcare Design since its inception and in November 2010 was named Director Emeritus.

based design, as defined by Hamilton and Watkins (2009, 9), is “a process for the conscientious, explicit, and judicious use of current best evidence from research and practice in making critical decisions, together with an informed client, about the design of each individual and unique project.” Evidence-based design has since expanded beyond healthcare design into architectural building design and landscape architecture.

What is Evidence-Based Landscape Architecture?

According to Brown and Corry (2011, 328), “evidence based landscape architecture (EBLA) is the deliberate and explicit use of scholarly evidence in making decisions about the use and shaping of land.” Landscape architects have long used observations, experience, and knowledge to inform design decision making. Two early examples are Ian McHarg in the 1960s using ecological mapping overlays to understand regional planning and William Whyte studying human behavior in urban settings in the 1970s (McHarg 1969; Whyte 1980). So what makes scholarly evidence different from observations, experience, and knowledge?

Brown and Corry (2011, 328) explain that evidence-based landscape architecture “uses knowledge – generally from methodically studied experiment or experience – as the principal information source for design,” as it has been defined above. But they go further to say that “EBLA supports decisions but does not dictate them.” It is a delicate balance of insight, creativity, research, and evidence that makes the EBLA process most successful – for “landscape architecture is far more than just design, and EBLA needs to be more than evidence-based design” (Brown and Corry 2011, 328).

Why is Evidence-Based Landscape Architecture Important?

Society today faces serious and complex issues that informed landscape architects can solve or for which they can at least create adaptive solutions. With increasing concerns about global climate change, widespread obesity, water scarcity, and returning urban populations, “landscape architecture has the potential to be as important to the health and well-being of the landscape and the populations in it as medicine is to humanity” (Brown and Corry 2011, 329). The landscape and all its associated complex systems across spatial and temporal scales “are our patients and the landscape architect the physician” (Brown and Corry 2011, 328). We must begin to ask ourselves “to what extent do our designs and plans prevent or solve [global environmental] problems rather than contribute to them?” (Brown and Corry 2011, 328). An informed and scholarly design process using credible evidence will allow landscape architects to devise solutions for some of the most difficult and complex questions facing our society while original research will generate questions for

further areas of inquiry. Thus EBLA is poised to better address the ecological, social, and economic concerns of our generation and the next than a typical design process.

The use of EBLA is not only driven by the motives and ethics of landscape architecture practitioners but largely by those that pay the bill: the clients. “Clients are beginning to demand credible data and assurances of building performance to validate the rising costs of design and construction” (Kopec, Sinclair and Matthes 2012, 2). Many clients, however, fail to invest the cost and time of research to support such assurances and evidence. EBLA as a process, rather than a means to an end, helps to more seamlessly integrate research and design to make the two simultaneously possible and profitable for both practitioner and client.

Landscape architecture is a relatively young profession as compared to medicine, so practitioners and academics constantly seek the means to establish scholarly credibility and advance the profession. Brown and Corry (2011) suggest that landscape architecture has a history of unreliable documentation, questionable practice ethics in today’s standards, and a period where it nearly disappeared in the mid 1900s. During this time, they suggest that the profession “[engaged] in destructive development and superficial, glitzy design ... [but it has] recently moved toward a stronger theoretical foundation. Using evidence to plan, design, and manage the landscape is necessary to re-establish landscape architecture’s respect, credibility, and leadership” (Brown and Corry 2011, 327).

It is with the goal to solve global issues, satisfy clients, and validate design decision-making that landscape architecture is moving towards an evidence-based design practice. However, to date, little is known about how practitioners are adopting and employing EBLA. It is important for firms to understand how other landscape architecture firms have successfully implemented EBD approaches, so that they too can adopt their own EBD approach frameworks with supporting design processes, components, organization, and culture. It is also imperative for individual practitioners to understand what the professional practice is trending towards in order to influence the next generation’s required skill set and education to meet those needs. Therefore, this thesis asks:

What evidence-based design approaches have leading landscape architecture firms developed and what have the internal effects been at each firm?

Literature Review

Introduction

In order to study how leading landscape architecture firms are developing and implementing evidence-based design (EBD) approaches, an understanding must be gained for what evidence-based design inherently is, what it is not, and what people in the field have already found about its use. The following literature review is a summary of the themes, issues, findings, and conclusions drawn from a variety of sources related to EBD in landscape architecture and other design professions. Literature was collected from known landscape architecture journals, periodicals, and books as well as from those of related fields to gain a comprehensive look at the state of EBD in professional practice.

The literature was grouped into five themes that range from fundamental definitions and meanings to the global significance of evidence-based landscape architecture (EBLA). While reading literature relevant to EBD, basic themes were identified and used to categorize quotes, notes, and ideas gleaned. The themes identified are:

1. The **nature** and relationships of evidence, design, and research
2. **Emergence** of evidence-based design (within and outside of landscape architecture)
3. **Integration** of evidence-based design into the design process
4. **Application** of evidence-based design in professional practice
5. **Propagation** of evidence-based design in the profession and its worth in the global context

These themes also translated into a case study framework (to be discussed later) enabling analysis across cases but also with regards to current literature. It is important to note that these five categories address the overall idea of EBD.

Primary sources

Robert D. Brown and Robert C. Corry; both professors of Landscape Architecture at the University of Guelph, Ontario; first coined the phrase “evidence-based landscape architecture” (EBLA) in their 2011 article, “Evidence-Based Landscape Architecture: The Maturing of a Profession”. Here they track the evolution of evidence-based practice from the earliest adoption in medicine and law into healthcare architecture and ultimately landscape architecture. Their objective in writing the article, however, was to urge the field of landscape architecture professionals and academics to follow suit and “become a discipline of evidence-based landscape architecture” (Brown and Corry 2011, 327). They recognized that “both the profession and the discipline of landscape architecture have a culture of

non-reporting ... Built landscapes are seldom tested or monitored to see if they achieved their stated objectives, and thus mistakes are repeated with remarkable and embarrassing efficiency” (Brown and Corry 2011, 327). With the profession’s ties to ecological, physical, and social sciences; the authors beg the question why landscape architecture has yet to follow the same research standards. Brown and Corry (2011, 329) make a convincing case that the use of EBLA will not only improve the work of practitioners and the credibility of the profession but also that “landscape architecture has the potential to be as important to health and well-being of the landscape and the populations in it as medicine is to humanity.” This article ultimately set the stage for this thesis because little was known about how landscape architecture firms were applying EBLA.

Beyond Brown and Corry’s article there is a lack of literature about evidence-based design and research in practice. Four secondary sources, used to understand the context of research in practice, are discussed in the following sections. The books address research, the combination of landscape architecture and research, and the combination of research and architecture. The common overlap between landscape architecture, professional practice, and research however remains as a gap in literature and understanding.

The literature map shown in Figure 2.1 illustrates the breadth of the discussion of topics that the current literature addresses. A body of literature exists that addresses the nature of evidence, research, and design as well as the call to action for landscape architects in the research world. More literature exists to theorize and speculate on the possibilities and impact evidence-based design in landscape architecture can have on the profession and the critical issues the world faces today. Very little literature addresses how this is being implemented in professional practice. The following literature narrative discusses the authors and works that most greatly define the conversation. The authors, works, and experts shown in the literature map but not discussed in the narrative of the literature review were used to provide some context, some definitions, some framing but they are not the focus of this study’s conversation.

EVIDENCE-BASED DESIGN

Nature and Relationships of Evidence, Design, and Research

This category of literature addresses the terminology surrounding the topic and the most basic relationship of one term to another. Authors discussed in this category define each of these words individually as well as their processes and products. The literature in this section begins to explore the basic relationships between design and research. The relationships range from general design to landscape architecture itself. Authors in this category are generally academic researchers from different fields.

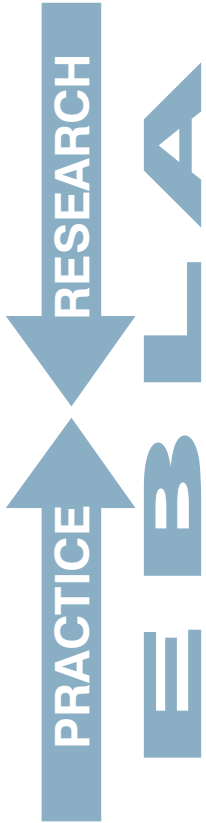
The meanings of ‘evidence’ and ‘research’, independently as well as in the context of evidence-based design, frame this study. While social and physical scientists are clear about what is considered evidence, designers often have no formal training in research methods and thus are unclear about what is considered evidence and the strength of that evidence (Brandt, Chong and Martin 2010). In addition, the profession faces another critical issue: “without shared research standards, we can’t tell if that knowledge is of good quality nor if it can be generalized from one project context to another (Brandt, Chong and Martin 2010, viii). In one attempt to define evidence for designers, Brandt, Chong, and Martin (2010, viii) asked experts in various related fields, “what constitutes evidence for design?” They deem evidence suitable for an EBD process when it is “credible and defensible in informing design decisions.” This definition suggests evidence can cover a wide range and both academics and practitioners agree that the design disciplines should consider this range when practicing EBD.

Zeisel clearly illustrates some of the most rigorous forms of evidence and alludes to how far the design disciplines must go to catch up to their scholarly counterparts. John Eberhard (2006, 12) uses one example in the forward of Zeisel’s book: “Architects have known intuitively the value of their design decisions on the quality of human experiences. Social and behavioral scientists have added an overlay of research that sharpens our understanding of how design impacts these experiences. Now it is going to be possible to use neuroscience research to answer the critical question of *why* this happens.” Based on the discussions from these sources, the types and range of evidence used by practitioners became part of this thesis although it was not a primary research question.

Much like the definition of evidence, research by definition and practice differs from evidence although it is often misunderstood and used interchangeably with evidence. After their interviews and case studies, Brandt, Chong, and Martin (2010, 282) discuss in their Lessons Learned chapter that “there is an important

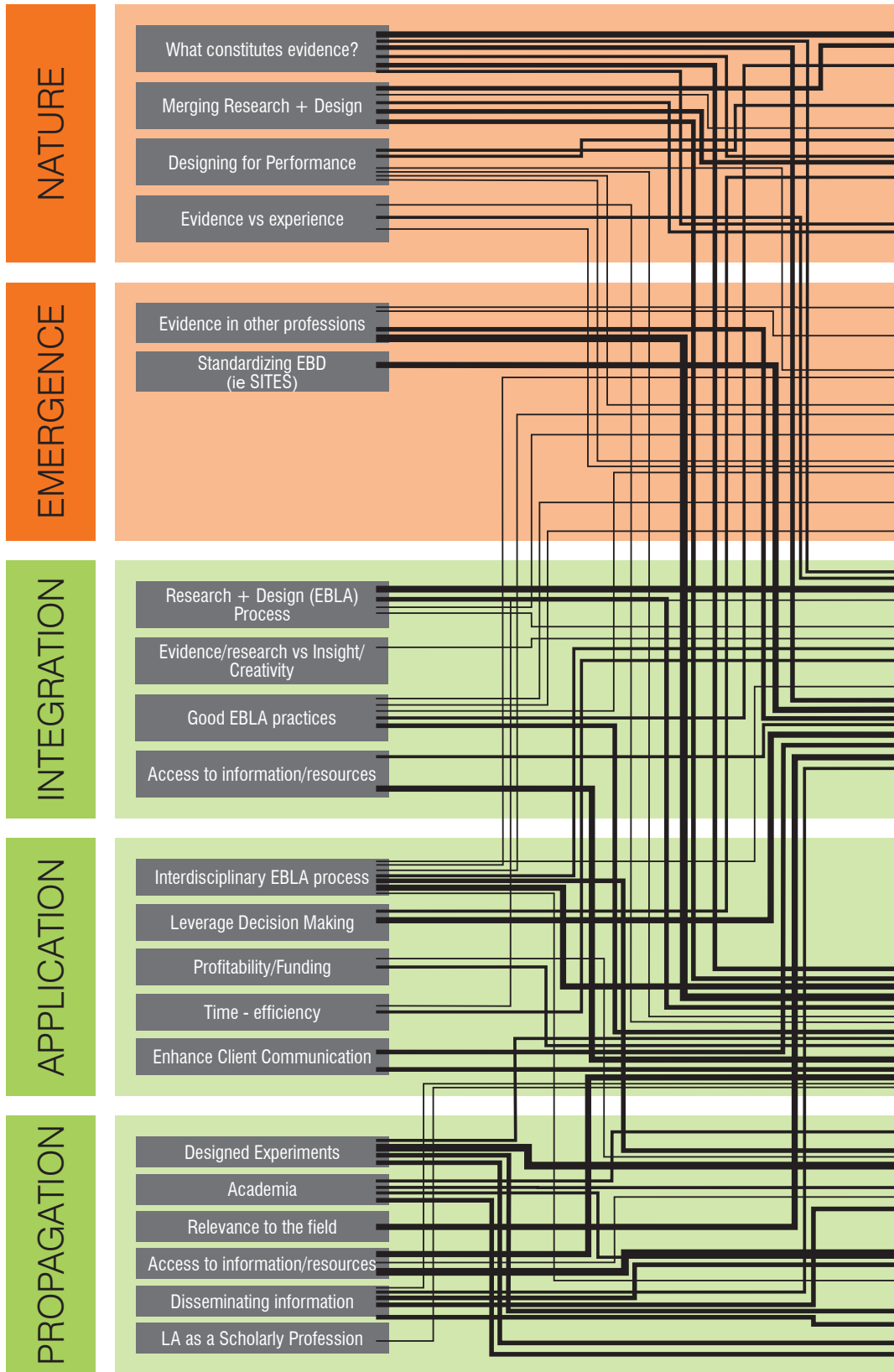
Figure 2.1
Literature Map. Shows knowledge currently available regarding EBD and areas of knowledge this thesis addresses. (Elise Fagan)

* Peer-Reviewed Source



Literature theorizes what *could* happen with EBD in practice but it is unknown **HOW** it is actually happening at firms

What the literature can definitively tell us about EBD



Deming & Swaffield. 2011. *Landscape Architecture Research*

*Musacchio. 2009. "The scientific basis for the design of landscape sustainability..."

Stem, et al. 2005. "Monitoring and Evaluation in Conservation: A Review of Trends and Approaches"

Kopec, Sinclair, & Matthes. 2012. *Evidence Based Design: A Process for Research and Writing*

Jost and Lamba. 2010. "Making Research Matter"

Friedlow. 2012. "An Evidence Based Design Guide for Interior Designers"

Center for Health Design. 2010. *An Introduction to Evidence-Based Design: Exploring Healthcare and Design*

Kondolf & Micheli. 1995. "Evaluating Stream Restoration Projects"

Fisher. 2004. "Architects Behaving Badly"

Hamilton & Watkins. 2009. *Evidence-Based Design For Multiple Building Types*

Smiley. 1997. "Farming and the Landscape"

Harris et al. 2008. *Practitioners Guide to Evidence Based Design*

Malkin. 2008. *A Visual Reference for Evidence-Based Design*

Augustin & Coleman. 2012. *The Designer's Guide to Doing Research*

Jost. 2012. "The Measured Response"

Hamilton & Watkins. 2009. *Evidence-Based Design For Multiple Building Types*

Brandt, Chong and Martin. 2010. *Designed Informed: Driving Innovation with Evidence-Based Design*

Macaulay. 2008. *Integrated Design: Mithun*

Kurt Culbertson (Design Workshop)

Design Workshop. 2007. *Towards Legacy*

Skip Graffam (OLIN)

Nelson Byrd Woltz (OLIN)

Sasaki. 2009. *Intersection and Convergence*

OLIN. 2008. *Placemaking*

*Thering & Chanse. 2011. "The Scholarship of Transdisciplinary Action Research"

*Brown and Corry. 2011. "Evidence-Based Landscape Architecture: The Maturing of a Profession"

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Robert Brown

*Milburn, Brown, Mulley, & Hilts. 2003. "Assessing academic contributions to landscape architecture"

*Felson and Pickett. 2005. "Designed Experiments: New Approaches to Studying Urban Ecosystems"

*Gobster, Nassauer, & Nadenicek 2010 "Landscape Journal and Scholarship in Landscape Architecture"

Landscape Architecture Foundation

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*Francis. 2001. "A Case Study Method for Landscape Architecture"

Culbertson. 2011. "Research Priorities"

distinction between the meaning of ‘research’ and ‘evidence.’ Research is the process of looking or searching for different solutions. Evidence suggests that something is evident or obvious ... For [designers], design always begins with research, with the task of searching to define a given problem and to discover different ways that it can be addressed in design.” In this context, however, research can refer to either an informal exploration or a prescribed research study using accepted methods. Zeisel illustrates how various types of evidence can affect the understanding of a particular situation. What architects know intuitively about the value of their design decisions differs from what social and behavioral scientists add to understanding how design affects experiences, which further differs from what neuroscience research can say about why something happens (Zeisel 2006, 12). Thus, we must clarify that credible research (whether using existing publications or generating original data) “implies that specific research has been designed to prove or disprove a hypothesis concerning relations (behavioral or physiological) between the built environment and its inhabitants using appropriate metrics” (McMinn 2013). Currently, academia is the primary source of credible research in the design fields although many of these authors suggest shifting that responsibility to practitioners as well.

As authors define and clarify research, it is interesting to note that research as an “iterative process ... a process of looking or searching for different solutions” sounds similar to a process that designers know well: design (Brandt, Chong and Martin 2010, 282). Augustin and Coleman (2012, xi) discuss this similarity while also noting that the two words, research and design are simultaneously nouns and verbs and that “the verb forms of design and research are synonyms – both are a question-answering process.” This could indicate that designers are natural researchers. In some instances, this may be true, but it also means that traditional research in the hard sciences is infiltrated by the insight, expertise, and creativity that designers rely upon. Zeisel’s research, although focused on the environment and neuroscience, parallels the relationship of design, research, and creativity in the design process. This alleged juxtaposition of science and art makes the profession of design researcher difficult and may be one reason why design professions are among the last to adopt an evidence-based practice.

While the term “design research” is considered redundant by Augustin and Coleman (2012), Kopec et al. (2012, 2) state that “‘design research’ refers to the procedures and techniques involved in a method of inquiry, data collection, analysis, and the presentation of the information that leads to design-related decisions.” By pairing

the words together, we start to arrive at the definition of evidence-based design (EBD). Similar to the terms design and research, EBD is both a verb and a noun: a process of seeking answers and a product of this process. Hamilton and Watkins (2009, 9) rightfully note that “defining evidence-based design as a process came last, in response to the many who expected a product – the ready-made answer to their most difficult questions.” It is not simply a means to an end but an integral part of the iterative design process (Brown and Corry 2011). Kirk Hamilton (2009, 9) thus defined EBD over a period of several years as “a process for the conscientious, explicit, and judicious use of current best evidence from research and practice in making critical decisions, together with an informed client, about the design of each individual and unique project.” It is clear from Hamilton and Watkins’ discussion of the evolution of this definition that each word is chosen purposefully, with the key words being “conscientious, explicit, and judicious.” It is the verb form of EBD that authors most readily use. While Hamilton’s definition is not prescriptive to any one type of design, The Center for Health Design (2008), of which Hamilton is a Director Emeritus, defines EBD as “The process of basing decisions about the built environment on credible research to achieve the best possible outcomes.”

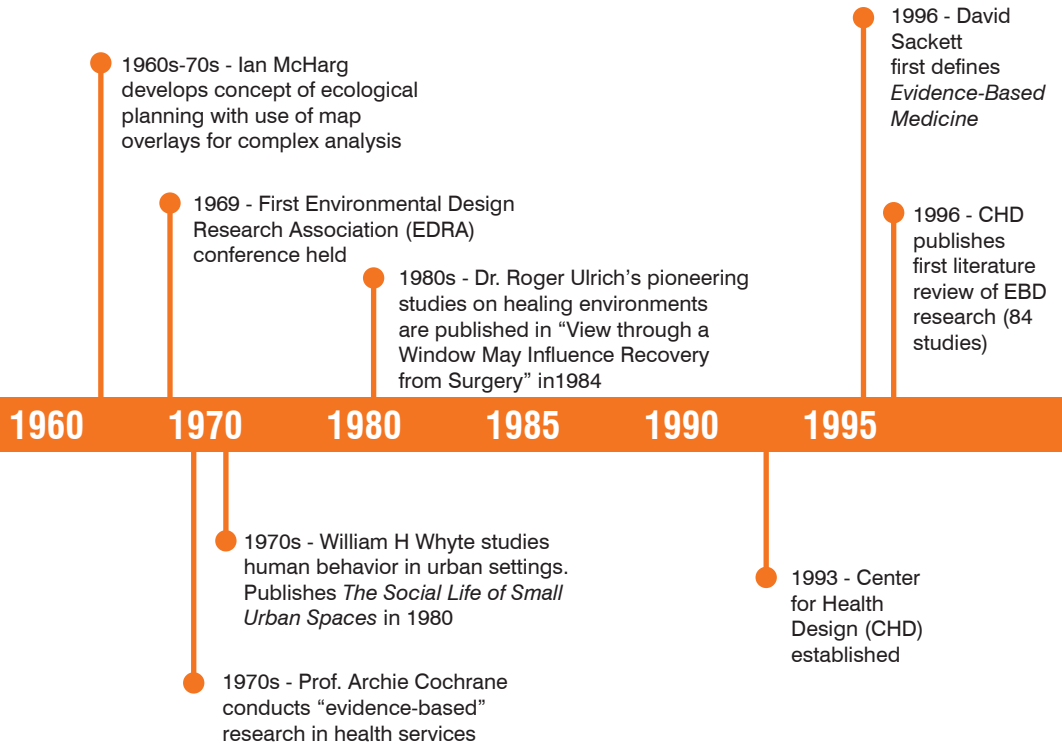
Following Hamilton’s definition structure, Brown and Corry(2011, 328) define evidence-based landscape architecture (EBLA) as “the deliberate and explicit use of scholarly evidence in making decisions about the use and shaping of the land.” Note their use of “scholarly evidence” (in reference to the previous discussion about evidence) to clarify that EBLA is not simply a casual exploration, but as Kopec et al. (2012, 2) put it, “an organized formal inquiry for the purpose of obtaining information that can be used for making design decisions.” Unlike Brown and Corry actually allude to landscape architecture in their definition, unlike Hamilton, while recognizing the breadth of evidence that landscape architecture might cover by simply saying “the use and shaping of the land.”

Emergence of Evidence- Based Design

This category of literature discusses the evolution of evidence-based practice from some of the more traditional professions (medicine, engineering, law) into the design professions and finally the push to use it in landscape architecture. The authors in this category are primarily design researchers, and some are specific to landscape architecture itself. Figure 2.2 illustrates major milestones in the development of evidence-based design and its application to landscape architecture.

Since the literature is limited in the area of EBD specific to landscape architecture, the context for this study was set largely by information about the evolution of

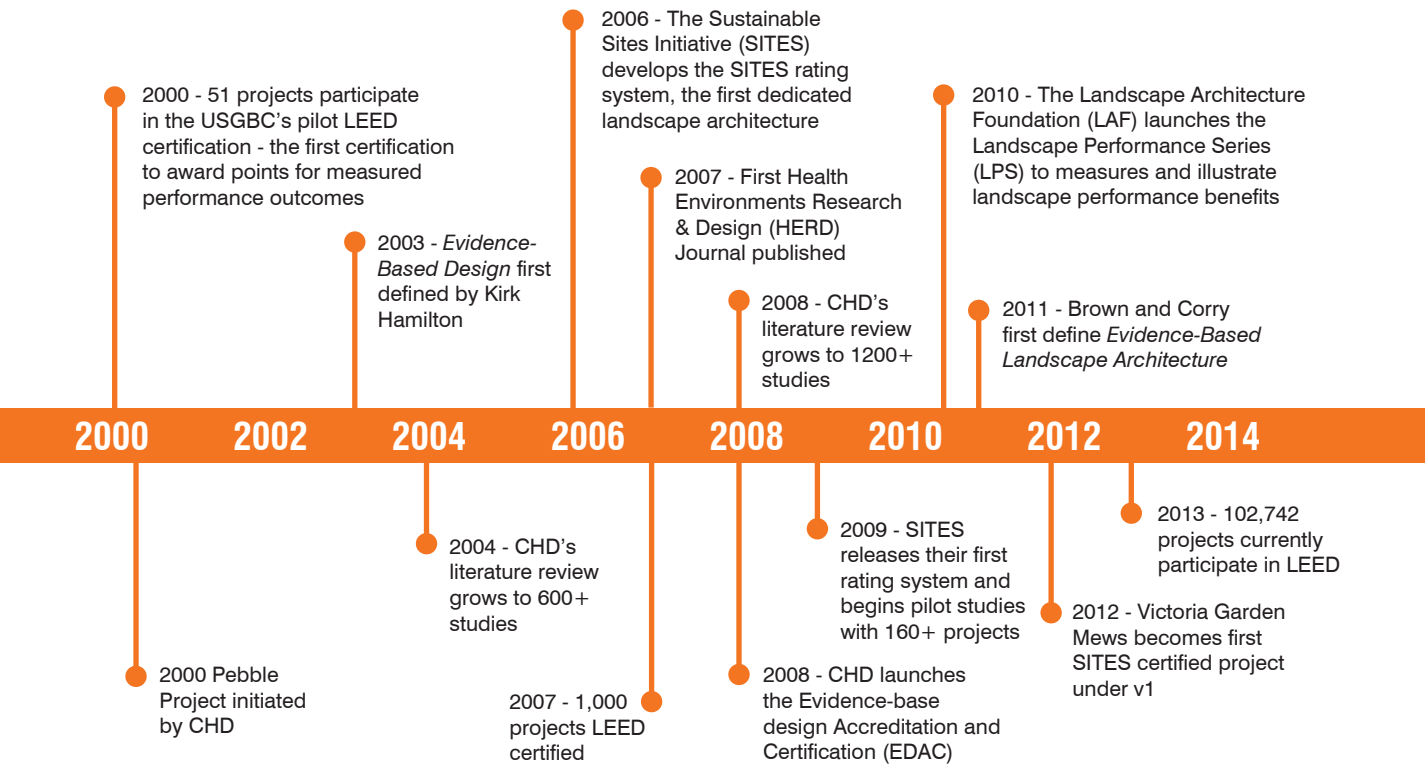
Figure 2.2
Timeline of Evidence-Based Design. Illustrates major milestones in the development of evidence-based design and its application in landscape architecture. (Elise Fagan)



evidence-based practice. Historically, medicine was the first field to adopt an evidence-based practice. Over the last century, "medicine has become one of the most powerful and respected professions by embracing scholarly information, methodical record keeping, monitoring, and reporting" (Brown and Corry 2011, 328). The design fields have taken cues from the medical field to the point that Hamilton derived his definition of evidence-based design directly from Sackett's definition of evidence-based practice. Other professions such as law, engineering, and ecology have followed suit and have also become evidence-based practices over the last century.

Hamilton and Watkins (2009, 19) argue that during the "late 1960s and 1970s, architectural education and architectural practice appeared to be reaching out for different systems on which to base the practice of building design ... to give more thought to the impact that buildings can have on those who inhabit them." This period of social responsibility awareness saw the formation of The Environmental Design and Research Association (EDRA) which focuses on gathering and disseminating research on the behavioral sciences that affect the built environment.

With evidence-based medicine being one of the first evidence-based practices, it is no surprise that evidence-based design first emerged in the healthcare architecture field. Roger Ulrich's 1984 report, "View through a Window May Influence Recovery from Surgery" is considered by most to be the first EBD study. As a result of



this relationship, an extensive body of literature exists concerning healthcare architecture with Hamilton being one of the prominent authors in the field. During this transition, Colin Martin (2000, 518) wrote in a British medical journal that “although the premise that physical environment affects well-being reflects common sense, evidence-based design is poised to emulate evidence-based medicine as a central tenet for healthcare in the 21st century.”

The publication dates on the literature relevant to EBD in landscape architecture, show that EBLA is relatively new. Steiner (2002, 91) outlines the growth and retreat patterns of landscape architecture as a profession over the past 100 years and states that the environmental movement of the 1960s and 1970s (the same time frame as discussed earlier) led by Ian McHarg was the first significant instance of evidence-based design in landscape architecture. Beyond ecology, this was also the era of William H. Whyte’s (1980) research on human behavior in urban settings relating social patterns to the built public environment. During this initial evolution however, Steiner accuses the profession of “engaging in destructive development and superficial, glitzy design as it transitioned through the eloquence- and eminence-based phases” (Brown and Corry 2011, 327). Kurt Culbertson (2011, 235) of Design Workshop also criticizes the profession stating that “the role of research in landscape architecture has always been weak relative to that of other professions such as medicine or engineering.” Brown and Corry (2011, 327-8) recognize that the “profession [has] recently moved toward a stronger

theoretical foundation ... [and they] suggest that it is time for the profession to transition to ‘evidence-based landscape architecture.’ This call to action has gained momentum in the last five years and is echoed by authors like Culbertson, Brown and Corry, and Deming and Swaffield. It is also evident in the missions of landscape architecture organizations like the Council for Educators in Landscape Architecture and the Landscape Architecture Foundation (2014), whose four-point mission statement includes research “to increase the capacity of landscape architects to solve the environmental crisis.”

Integration of Evidence-Based Design into the design process

This category of literature begins to discuss how design firms use evidence-based design in their work. Sources also identify methods for using research in design. Much of the literature pertains to healthcare design with little to no information about how landscape architecture firms apply evidence-based design. This gap was the primary driver behind this study’s research question. Several frameworks proposed by authors for implementing evidence-based design were used to inform the framework for the case studies. The primary authors contributing to this category of literature are academics who specialize in integrating and applying evidence-based design as well as some practitioners.

Deming and Swaffield’s (2011) book entitled *Landscape Architecture Research*, primarily identifies research methods useful to landscape architects and how to use them. For a field of practitioners generally unfamiliar with accepted research methods, this is a useful reference. Deming and Swaffield discuss the role of research in practice in chapter 14. While *Landscape Architecture Research* is organized by the type of research one can undertake based on the type of data and expected outcomes, Augustin and Coleman’s (2012) book, *The Designer’s Guide to Doing Research*, outlines research methods and tools that could be useful at different stages of the design process. The authors not only encourage practitioners to do research but support fully integrating the research process into the design process. The book “identifies ways to acknowledge the information generated by the design process” (Augustin and Coleman 2012, xiii).

Deming and Swaffield (2011, 237) suggest that “professional practice constitutes a (mostly) untapped research capacity of enormous potential value for the discipline,” which was an important part of determining how this study could fill a gap in the literature. This, along with Brown and Corry’s (2011) call to action, was a major driver for conducting this research at this critical time. Deming and Swaffield (2011, 242) ultimately found practitioners to be active and passive consumers of research,

taking advantage of academic studies published in subscription magazines but failing to return the favor as integrated players in the effort to increase knowledge in the field. The desire for a more research-educated generation of practitioners is the basis for the book and its mission to bridge the gap between research and practice.

Augustin and Coleman (2012, xiii) also acknowledge the importance of analyzing, applying, and storing data. Brandt, Chong, and Martin (2010, viii) reiterate the same concept in *Design Informed: Driving Innovation with Evidence-Based Design*, by describing the “development, application, and dissemination of research that could serve as evidence.” Hamilton and Watkins suggest in their “Four-Level Model of Evidence-Based Design” that by partaking or not partaking in these practices, practitioners can be categorized into certain levels of EBD rigor. This can range from a basic awareness of studies in the field to doing their own original research using accepted research methods; and, in the highest case, subjecting that research to critical review. This break down of the fundamental processes of EBD is a recurring theme among EBD authors and became a major factor in developing the research question for this study: just how are firms analyzing, applying, storing, and disseminating information? These questions became some of the subcategories to the case study framework under Integration, Application, and Propagation.

Brandt et al. (2010, 2) address the major concern that “many designers feel that the notion of ‘evidence’ is foreign to the design process they know.” However, as most, if not all, authors of evidence-based design advocate, research and evidence should be used to enhance the design process (Augustin and Coleman 2012; Brandt, Chong and Martin 2010; Brown and Corry 2011; Hamilton and Watkins 2009; Kopec, Sinclair and Matthes 2012; Zeisel 2006). For instance, Kopec et al. (2012, 2) distinguish that “[design research] focuses on answering important questions that arise from the design process, not the product, and the answers are then applied to the design.” Similarly, “it is important to recognize the difference between design as a service or problem-solving endeavor and design framed as an investigative strategy” (Deming and Swaffield 2011, 51). The latter approach, the authors argue, aids in the design process rather than being an additional burden. Like much of the literature emphasizes, research and evidence should be a tool and means by which complex problems are solved.

Designers’ focus on holistically resolving complex problems by integrating information from diverse fields provides them with an approach to problem solving that is receiving increasing attention and respect as

more and more business, medical, and other professionals see the benefit of applying this approach to the "wicked problems" in their own work processes. (Augustin and Coleman 2012, 1-2)

While "wicked problems" are present in both academic research and practice, Kopec et al. (2012, 2) distinguish that "an area where design research differs from academic research is in the 'application'. Design research produces information that designers need to make decisions." Hamilton and Watkins (2009, 37) similarly note, "There is a large realm of practical research that lies between casual exploration of information sources and academic research. The data collection and analysis performed by non-academic practitioners is frequently called 'applied' research."

Applied research refers to evidence-based design or the concept of applying research to inform design. The opposite of that is generating studies using design interventions to create new knowledge; this is design to inform research. Both relationships between research and design are identified in the literature. Evidence-based design emerged from the need to justify design decisions, to improve methods of design. But incorporating research into the design process has an added benefit: "landscape architects implicitly derive new hypotheses for every project, yet seldom think of built projects as field experiments" (Brown and Corry 2011, 327). Deming and Swaffield (2011, 205) identify that "synthetic or generative design itself is being framed as a strategy for research." Two authors in particular have commanded this realm of possibility in their 2005 article "Designed Experiments." Felson and Pickett (2005, 555) propose using "design projects as ecological experiments in metropolitan systems . . . [thus] treating urban landscaping as an experimental substrate . . . [by] integrating traditional research with the functional and aesthetic design of urban space." They repeatedly cite the potential knowledge gleaned by designers and the community from designed experiments. Likewise, designed experiments give fields like ecology and sociology an avenue through which experimentation is possible.

Authors of evidence-based design guides agree that there are certain steps to evidence-based design. The Center for Health Design's eight-step evidence-based design process, shown in Figure 2.3, parallels the steps of design and implementation in practice. Brown and Corry (2011, 328) discuss five basic steps (question, literature, evaluate, synthesize and apply) that are similar to a research study procedure. Figures 2.4 and 2.5 compare the typical linear design process to that of a generic evidence-based design process as outlined by Augustin and

Figure 2.3
The Evidence-Based Design Process
(Adapted from *The Center for Health Design 2009*)



Coleman (2012); Brandt, Chong and Martin (2010); and Brown and Correy (2011).

Another concern addressing the design profession's slow move to adopt and implement EBD practices is the debate over evidence and research versus insight, creativity, and expertise. Many critics worry that EBD is overly prescriptive. "Many architects are fearful that the process will inhibit creativity" (Brandt, Chong and Martin 2010,

ix). In a 2012 article in *Landscape Architecture Magazine*, Daniel Jost (2012, 95) describes that "a schism had arisen [during the previous decade] between landscape architects who favored intuitive artistic design and those who thought design should be grounded in environmental or social thinking." Authors of EBLA consistently advocate for seamless coordination between the two that does not favor one over the other but rather integrates them: "... integrating the best of the traditional intuitive approach with an empiricism that enhances design outcomes ... Think of [EBD] as 'Informed Intuition' – a healthy mix of the professional's instincts and a broad, deep knowledge base from many sources" (Brandt, Chong and Martin 2010, viii, ix). Similar to the argument that EBD diminishes creativity in the design process, authors note that many established professionals are weary of EBD because they have always made design decisions based on their own experiences, which is not to be eliminated but rather justified. Brown and Corry (2011, 327) note that "much of contemporary practice in landscape architecture is still based on beliefs rather than facts." Brandt et al. (2010, vii) conclude that "architects and other design professionals typically depend on intuition and personal project experience to make design choices. That works at some level but is limited by the self and the past ... The time has come to move on from this self-limiting approach." Not only can beliefs be limiting to the design process but they can be outright detrimental: "mistakes, even sincere mistakes of sincere belief, can have even more serious consequences" (Smiley 1997, 42).

Figure 2.4
 Typical Linear Design Process Diagram
 for Landscape Architects.
(Adapted from Lynch and Hack 1984, 11)

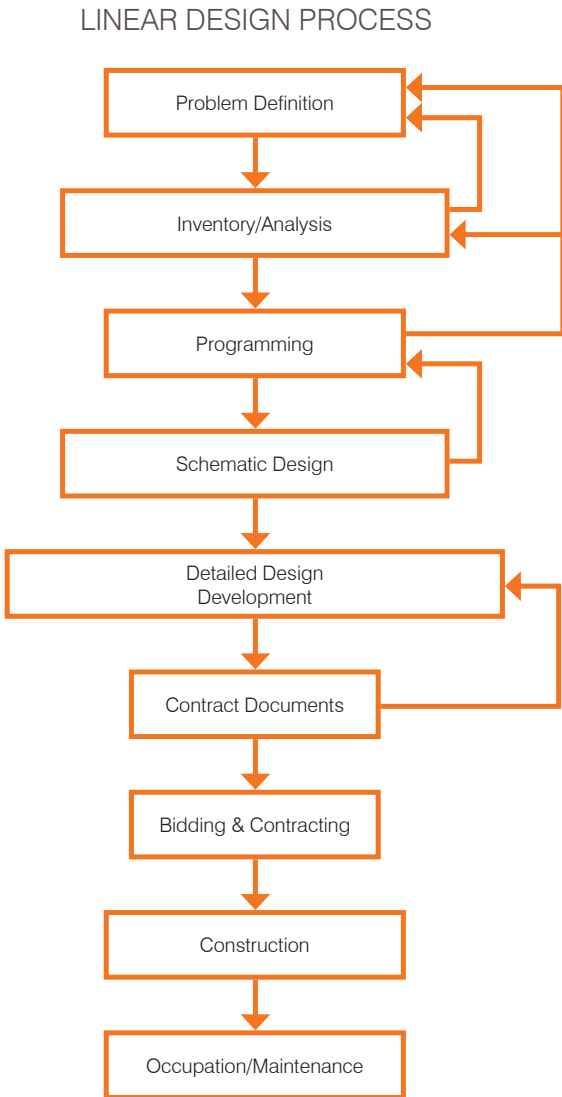
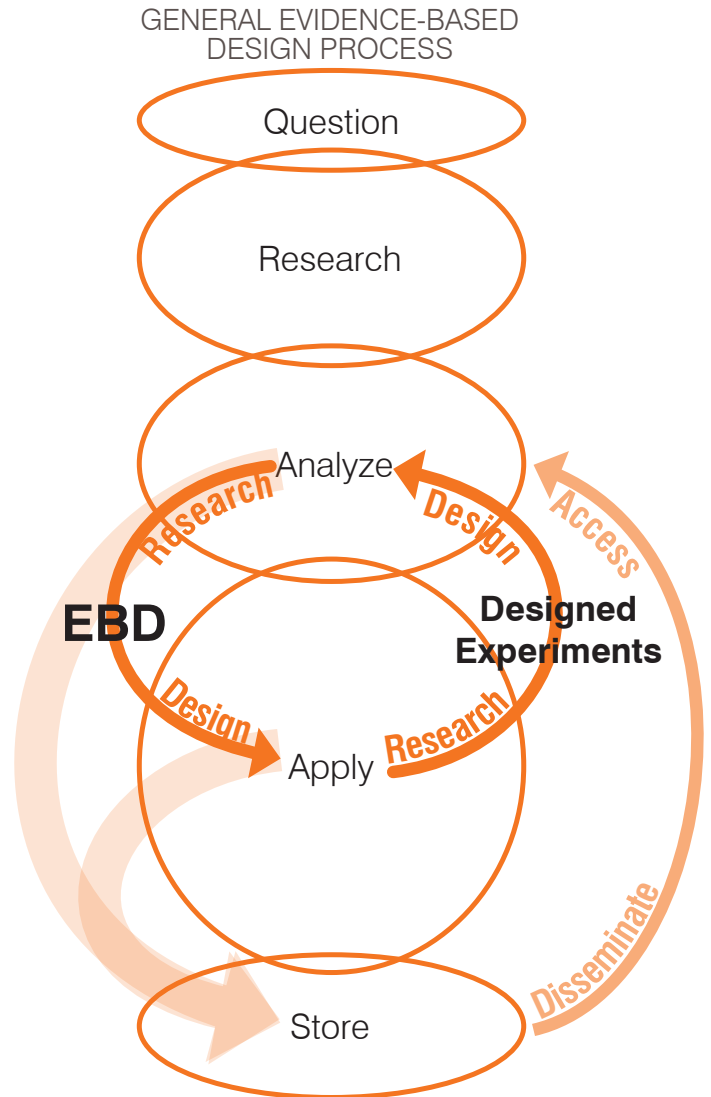


Figure 2.5
 General Evidence-Based Design Process.
 Non-linear, more iterative, and focused on the generation,
 application, and dissemination of new knowledge.
*(Elise Fagan, developed based on information from
 Augustin and Coleman 2012; Brandt, Chong and Martin
 2010; Brown and Correy 2011)*



Application of Evidence-Based Design in Firms

This category of literature continues to discuss how evidence-based design is implemented in professional practice. The literature in the category makes the case for research in practice and how that makes the day to day practice of the firm more efficient and profitable. While the EBD literature makes many successful cases for how EBD can be integrated into projects efficiently, there is very little acknowledgment of the firm's role in these processes: how firms actually win this type of work, how they communicate with their clients, who they have to collaborate with to get the right evidence. The authors discussed in this literature review are the biggest proponents¹ of evidence-based design and as such, they present compelling arguments for its *potential* use. However, there are few examples from the literature as to *how* it is actually being done.

Brandt et al. (2010) present four examples of reasons professionals should employ EBD practices. EBD can decrease project costs by eliminating design waste and excess programming. EBD can help leverage decision making with the client as well as a way for the client to leverage funding and community support. EBD can improve both human and ecological health and well-being. EBD can also be the means to discovering new design practices or identifying practices that are assumed to increase performance but do the opposite (Brandt, Chong and Martin 2010, vii). In making their case for EBD, Hamilton and Watkins use three points of view: the practitioner, the client, and the profession. The practitioner's point of view shows that "if more design decisions are made on the basis of the best available evidence, and if the lessons learned on each project are consistently applied to subsequent projects, the quality of a firm's projects should gradually and measurably improve" (Hamilton and Watkins 2009, 16). In addition, "the competitive advantage offered by tying design to positive client outcomes may be the reason to adopt this model" (Hamilton and Watkins 2009, 17). The client's point of view shows that EBD ensures a design process based on measured outcomes and promised performance. Most compelling to a client is the financial performance of the project but can also include performance indicators such as employee turnover and product output.

Propagation of Evidence-Based Design

The final category of literature addresses the influence that EBD has beyond the firm. The literature discusses how evidence-based design is growing beyond the firm and how it influences the way practitioners relate to academics, to other disciplines, and to supporting organizations. The literature also covers what EBD is or should be doing for the profession, among professional organizations, and in

¹ There are no known published critics of evidence-based design to date.

the global context. In attempting to answer “why EBD?” authors discuss how EBD may be the answer to growing global issues and how landscape architects, armed with EBD processes, can combat these issues. The authors in this category are primarily practitioners aiming to change the status quo in the profession.

Although Brown and Corry (2011) discussed the early steps in the EBD process (question and research), they did not include the post-application steps that Augustin and Coleman (2012) reference in their three-step approach: analyze, apply, and store. Moreover, Brandt et al. (2010) included a dissemination step at the end of their development and application EBD process. The store and dissemination steps are reoccurring themes in the more recent literature, suggesting that authors recognize the need for the availability of published studies in order to develop the field of EBLA. “Architecture lacks the research standards and protocols necessary for widespread development, application, and dissemination of research that could serve as evidence” (Brandt, Chong and Martin 2010, viii).

Hamilton and Watkins' third case for evidence-based design focuses on the profession itself. They suggest that EBD can offer the “reversal of the current erosion of architects’ credibility with their clients ... when practitioners adopt higher levels of rigor, the entire profession will benefit” (Hamilton and Watkins 2009, 17). Culbertson adds that firms who adopt knowledge-based practices can more readily attract and secure the most talented and well-trained professionals (Culbertson, et al. 2013).

Brandt et al. (2010, vii) warn that “[EBD] hasn’t been widely embraced by the profession but it is relevant to all design professionals who wish to remain relevant.” Similarly, Hamilton and Watkins (2009, 6) advise that “if a modest change in practice can lead to better decisions, increased rigor, and the capture of relevant data that offer the potential for a competitive advantage, design practitioners would be well advised to adopt an evidence-based model.”

Gap in Literature

The literature revealed a limited breadth of EBD in professional practice. The limited resources that do address EBD in professional practice theorize how the two come together and the closest the literature gets to actual examples is by detailing projects and the EBD process. However, no literature was found to discuss how firms are actually incorporating these processes and tactics into their firm practices and how that affects the day-to-day practices. Despite a gap

in literature, some landscape architecture firms are known to practice EBD at a firm-level. These firms can serve as cases to provide insight into this area of missing literature and examine the question: how are firms integrating EBD into professional practice.

LITERATURE REVIEW OF METHODS

Case Studies

To examine individual cases of EBD in practice, the case study is a suitable form to explore firms as individual bounded systems. No literature, however, was found to address the methodology of design firm case studies with respect to evidence-based design. Additionally, no examples or frameworks of firm case studies were found.

“Case studies often serve to make concrete what are often generalizations or purely anecdotal information about projects and processes” (Francis 2001, 1). *Case studies* are thus the recognized research method used to frame the qualitative research, analysis, and compilation of a thorough investigation of firm approaches. The case study, specifically a *collective case study*, examines the development of formal evidence-based design approaches in firms and uses four leading landscape architecture firms known to practice EBD as specific bounded-system illustrations (Creswell 2007). The case studies and their procedures represent “[a holistic account] involving reporting multiple perspectives, identifying the many factors involved in a situation, and generally sketching the larger picture that emerges” (Creswell 2007, 39).

Data collection for case studies “draw[s] on multiple sources of information” (Creswell 2007, 75). Yin (2003) also suggests using other sources like documents, archival records, and direct observations.

Cross-Case Analysis

While the case study “provides a detailed description of each case and themes within the case,” a *cross-case analysis* entails “thematic analysis across the cases” (Creswell 2007, 75). Also known as a *collective case study*, the cross-case analysis utilizes several cases to reveal different perspectives on the issue and harnesses the logic of replicable procedures to allow for comparisons across case studies (Creswell 2007; Yin 2003).

Interviews

The *focused interview* method matches the inductive nature of the qualitative case study and thus is an appropriate method of data collection for a case study. The focused interview is “malleable enough to follow emergent leads and standardized enough to register strong patterns” (Oliker 1989, xvi). The focused interview

(Frankfort-Nachmias and Nachmias 1992, 224; Zeisel 227) or a semistructured interview (Creswell 2007, 130) is conducted by using standardized starting-point questions. This allows consistency across interview, which is important when developing case studies, but also encourages open-ended discussion which is important to an inductive study. “We ask open-ended research questions, wanting to listen to the participants we are studying and shaping the questions after we ‘explore’ ...” (Creswell 2007, 43).

Denzin and Lincoln (2005, 3) explain that “qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them.” It was therefore advantageous for focused interviews to be conducted in-person and particularly in the setting that the researcher is studying; in this study's case, the firm office.

Transcription and coding help translate interviews into usable data. Verbatim transcription suggests that “all pauses, broken sentences, interruptions, and other aspects of the messiness of casual conversation are faithfully reproduced” (Holstein and Gubrium 2003, 271). Open coding suggests taking the interview transcription data and developing categories (Strauss & Corbin 1990; Creswell 2007, 240). Creswell (2007, 240) suggests “developing a small number of categories, slowly reducing the number from, say, 30 to 5 or 6 that become major themes in a study.

Methodology

Research Question

What evidence-based design approaches have leading landscape architecture firms developed and what have the internal effects been at each firm?

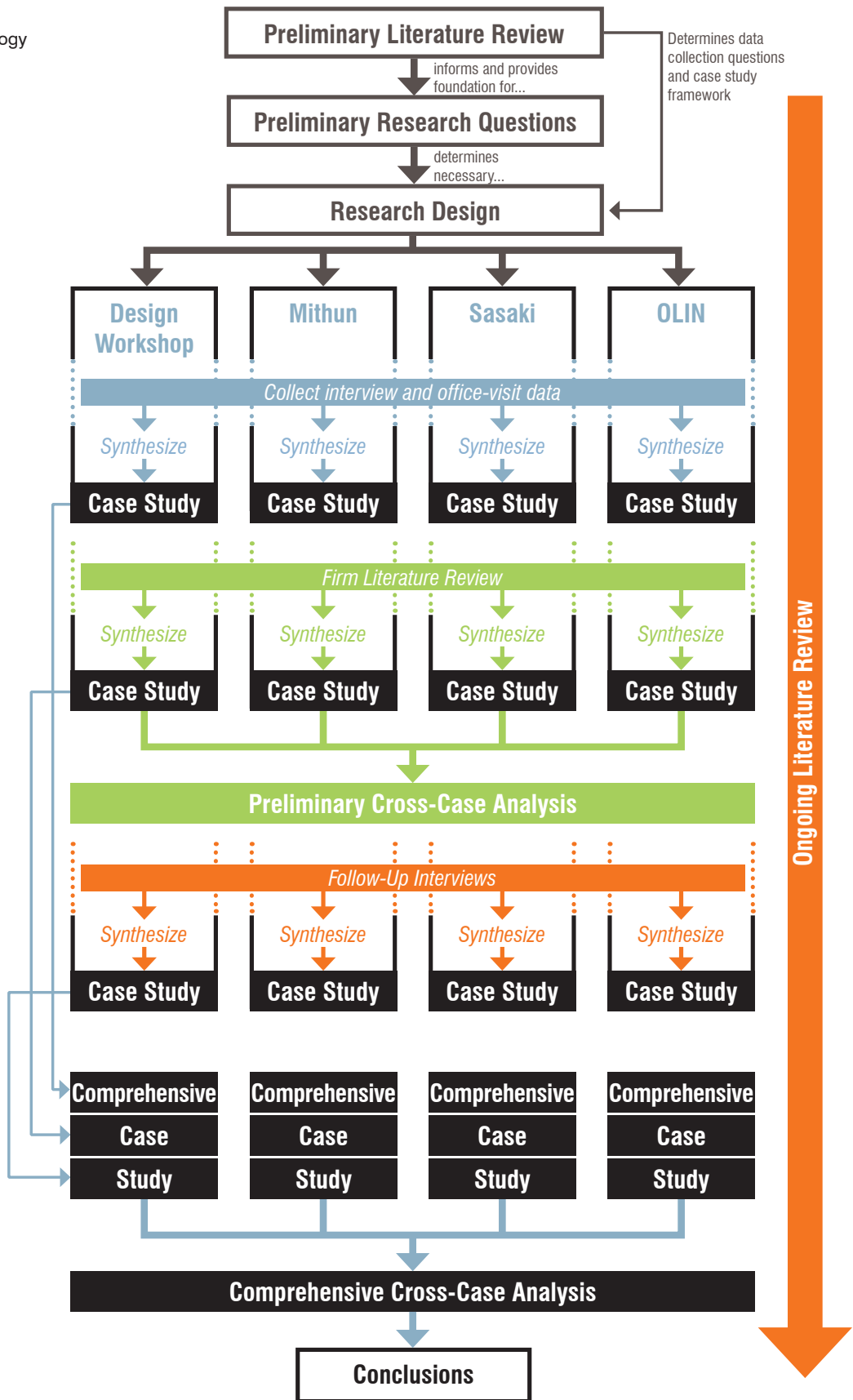
Research Design

In order to answer the research question, the case study was used as the primary method for organizing and recording information. Since it was identified in the literature review that there is a general lack in understanding of how landscape architecture firms are actually implementing EBD in practice, it was decided that an examination of firms who *are* implementing EBD in practice would be appropriate. To examine individual cases of EBD in practice, the case study is a suitable form to explore firms because it can be structured to study individual bounded systems. The case study also supports consistency in methods and analysis for individual bounded systems to then be compared.

As a research method, the case study employs numerous points of qualitative data collection. The multiple sources triangulates information in order to best validate the data. The triangulation for this research is based on information collected in three phases of the case studies: initial interviews (with office visit observations), publications by and about the firm, and follow-up interviews. Each phase was done consecutively to build upon the last while informing the comprehensive case study for each firm. All four case studies were conducted in parallel to ensure consistent methods are used across cases. At the completion of the individual cases a cross-case analysis identified commonalities and uniquenesses between the firms and emerging trends in the profession.

Comprehensive case studies were developed to examine four leading landscape architecture firms known to have developed formal approaches to evidence-based design. Data was collected individually by firm through *focused interviews* with leaders of research at these selected firms and in-person office visits. Each case was analyzed and synthesized individually by means of a case study framework. Each firm's own publications, by or about themselves, were used to add depth and context to each case study. The information gleaned from the publications was analyzed and synthesized using the same case study framework. A follow-up with each firm was done to fill gaps and the information was added to each individual case study per the framework. All four cases were then cross-analyzed using the same framework. Figure 3.1 on the following page illustrates the conceptual flow of preparation, data collection, synthesis, and resulting products. It is also further described below.

Figure 3.1
 Research methodology
 flow chart
 (Elise Fagan)



Target Cases

The firms selected to be case studies were identified by the author as leaders in landscape architecture practice and particularly leaders in evidence-based landscape architecture (EBLA)¹ who have developed formal methodical approaches to combine research and design. In order to conduct valuable individual case studies with a cross case analysis, the researcher requires more than one so that a cross-case analysis can be performed but less than five to achieve a suitable depth of research (Creswell 2007). The sampling size was therefore targeted to be four after identifying four firms that met two basic selection criteria: 1) leaders in landscape architecture, and 2) leaders in landscape architecture who use EBLA. Leaders in landscape architecture were identified as having an award history, frequently speaking or serving as panelists at conferences, publishing both peer reviewed and marketing works, and serving in organizations like the Landscape Architecture Foundation, Urban Land Institute, or American Society of Landscape Architects. The second criterion identified firms with a research department, researchers, and/or a director of research. The four characteristics that identify leaders in landscape architecture likely overlap with the characteristics identifying firms using EBLA because the firms likely publish, present, and receive awards in-part due to their innovations in evidence-based design.

Several professional academics (including the major professor and committee) and practitioners informally approved the selected four firms, confirming that these firms are indeed perceived as leaders in evidence-based design and landscape architecture. All four firms indicated they were willing to participate.

The four firms are Design Workshop, Mithun, OLIN, and Sasaki Associates (see individual case study cover pages in Chapter 4: Findings for firm profiles). These firms and their principals have been active voices in the discussion about EBLA through publications and conference sessions. In addition, all firms have participated in or are currently participating in Landscape Architecture Foundation (LAF)'s Case Study Investigation (CSI), a testament to the firm's commitment to measuring performance and enhancing the field's body of knowledge. Lastly, most of these firms have designated research leaders and/or whole research departments. It was also expected at the onset of the study that these firms had diverse approaches and would each add a different perspective to the cross-case discussion.

¹ Leaders in the common field of both EBD and landscape architecture are essential because the goal of the research is to understand best practices for EBLA rather than the state of all landscape architecture practice.

Target Interviewees

The subjects interviewed for the case studies were selected because they were identified as leaders in research and EBD efforts at their respective firms. Interviewees also included firm leaders who could attest to the emergence and evolution of the approach in the context of the firm's history. Initially, only one or two people from each firm were targeted for interviews, but as individuals expressed the limits of their expertise during the planning stages of this research, the need to include several individuals involved in the evolution and/or implementation of the EBD approach became evident. In some cases, one individual's knowledge was sufficient to provide answers to all interview questions; in other cases, it was more appropriate to have a group discussion, more like a focus group. "Focus groups are advantageous when the interaction among interviewees will likely yield the best information ..." (Creswell 2007, 133). In all cases, two different time slots per firm were allotted for interviews (whether one-on-one or focus group). This allowed the interviewer to focus on a smaller pool of questions specific to the person(s) being interviewed and allowed more time to cover the range and depth of topics required by the interview.

Figure 3.2
Table of interviewees. Interviewees from each firm during each phase of research are shown. (Elise Fagan)

Firm	1st Round Interview - Timeslot A	1st Round Interview - Timeslot B	2nd Round Interview
Design Workshop	Allyson Mendenhall ^{▲●■} Associate, Director of DW Legacy Design [®] July 15, 2013	Kurt Culbertson ^{+■} Partner, Chairman, and CEO July 16, 2013	Allyson Mendenhall [★] Associate, Director of DW Legacy Design [®] September 26, 2016
Mithun	Christian Runge ^{▲●■} Associate Noelle Higgins ^{▲●■} Associate July 18, 2013	Deb Guenther ^{+■} Partner July 18, 2013	None
Sasaki Associates	Anthony Fox ^{▲●■} Associate Maggie Dolan ^{▲●■} Strategic Planner Greg Janks ^{▲●■} Principal, Director of Sasaki Strategies Ken Goulding ^{▲●■} Associate Director of Visualization July 23, 2013	Joe Hibbard ^{▲●■} Principal July 23, 2013	Ken Goulding [★] Associate Director of Visualization October 10, 2016
OLIN	Karl-Rainer Blumenthal ^{▲■} Research Librarian and Archivist July 25, 2013	Skip Graffam ^{▲■} Partner, Director of Research Chris Hanley ^{▲■} Partner, Director of Technology July 25, 2013	Danielle Toronyi [★] Research Development & Knowledge Manager October 6, 2016

- + by phone
- ★ by email
- video recorded
- audio recorded
- ▲ in person

The second round of interviews, completed after a preliminary cross-analysis, was conducted as a follow-up and included one interviewee per firm. This was appropriate for filling the necessary gaps to complete the case studies. Some Each interviewees in the second round had participated in the first round and was deemed appropriate to answer the follow-up questions specific to that firm. Some interviewees from the first round had left the firm over the course of the research and a new interviewee for the second round was determined. The table below shows the final list of interview participants per firm.

DATA COLLECTION

Interview Procedure and Execution

First person data was collected in two parts: first, to gather most of the information using a consistent framework of questions for each firm; second, to fill in gaps in the case studies using questions specific to each firm.

The primary procedure of inquiry for the first portion of data collection was the interview because of its conversational aspect, the ability to probe further or clarify, and the relationship it builds between interviewer and interviewee. Having few existing recorded testimonies of the approaches to evidence-based design that these firms have developed, either written or oral, it was the goal of the interviews to open the doors into leading firms' approaches to EBLA in practice, give them a voice, and give the audience a chance to hear from the sources themselves. The specific interview type used was a *focused interview* which consists of standardized starting-point questions to allow a mix of structure and open-endedness (Zeisel 2006). Each interview was guided by a set list of questions but could be followed up with clarifying questions or further probing questions if needed as conducive to the emergent nature of qualitative research (Creswell 2007). Based on the direction of the interview, the questions were not necessarily asked in the same order but the topics that the questions sought to answer were all covered by the end of the interview.

The first round of interviews was conducted in person due to the advantage the interviewer has in seeing the informal communication of interviewees. It was therefore advantageous to travel to each office for in-person interviews. This also provided opportunities for informal observation at each of the offices – this context certainly informed the end case study. Although the goal was to do *in-person* interviews for every interview, the availability of some target interviewees only allowed for a phone interview.

In all cases, the first round of interviews was either video recorded or audio recorded. Audio recording was limited to the phone interviews and when the individual(s) preferred not to be video recorded. All recordings were thoroughly transcribed using verbatim transcription rules “in which all pauses, broken sentences, interruptions, and other aspects of the messiness of casual conversation are faithfully reproduced” (Holstein and Gubrium 2003, 271). This transcription type was used to authentically reproduce the interview conversation for the future audience of the study as well as remembering the flow of the interview during the coding process.

The second round of first person data collection was conducted via email. A list of questions was sent to the interviewee or to another representative of the firm if the original interviewee was not available. The interviewee was asked to provide written responses. This method was used because of the limited amount of information needed to fill the gaps in the case studies and the relatively concise responses required. It also allowed the interviewee to double check factual information concerning the firm with other colleagues.

Interview Questions

Each interview consisted of a prepared list of sixteen primary questions with follow-up questions used for probing or to clarify the direction the interviewer hoped to go. The questions were formed to explore four topic areas determined from the literature review. While the literature review addressed five themes with regards to EBD and practice in general, the methodology shifts that lens to address four topic areas with respect to each particular firm's evidence-based design approach. The two categories in the literature review, Nature and Emergence, coalesced into one category for the interview framework and, furthermore, the case study framework to discuss an overview of the firm's approach and how it came to be. The specificity of how individual firms are developing EBD approaches is essentially the missing gap in literature that was initially identified. The four categories used to develop the interview questions (and then the case study framework) are:

1. The **nature** and **emergence** of the firm's EBD approach
2. The **integration** of the firm's EBD approach
3. The **application** of the firm's EBD approach to their professional practice model
4. The **propagation** of information within the firm and beyond to the field

The following are the primary questions used for all interviews organized into the four categories used to study professional practice EBD approaches. As mentioned previously, these were not always asked in the same order, but all questions were covered between the two interviewee groups.

NATURE + EMERGENCE

1. Can you please describe the firm 's evidence-based design approach?
 - 1.1. Is there a formal strategy?
 - 1.2. How is evidence produced? How is it used?
2. When did evidence-based design first emerge at the firm?
 - 2.1. When did scholarly research become important to the process?
 - 2.2. What sparked this development?
3. When did the need for a formal strategy emerge? Why?
 - 3.1. When was it first realized that a more organized strategy was needed (to make efficient use of literature, research, data, findings, performance metrics, etc.)
4. Can you please describe how the approach has primarily evolved since then?
 - 4.1. What changes have been made to the approach to make it more efficient? More formalized? More marketable?

INTEGRATION

5. How do you get your designers to share in this mission?
 - 5.1. How are the design teams motivated to use this approach?
 - 5.2. How do the designers know that this approach will benefit them?
6. How do you ensure or encourage that the approach is being used effectively?
 - 6.1. Are there design reviews based around the approach? Are there check-in points? Does someone monitor the approaches use and successes?
7. How does the use of evidence to inform design decision-making affect or not affect your creative design process?
 - 7.1. How do you balance intuition and creativity with evidence-based decisions?
8. Can you please describe how the approach has or has not affected office design culture?
 - 8.1. Spaces? Collaboration? Communication? Atmosphere?
9. Can you please describe how project team organization has or has not been affected due to the approach ?
 - 9.1. Different leadership structure? Different tasks?
 - 9.2. Transdisciplinary collaborators?

10. Can you please describe how the development of the approach has or has not changed firm structure?

10.1. New positions? New departments?

11. How do you share your research findings internally?

11.1. Is there a department, system, or database where your designers can find studies, data, literature, lessons learned, etc?

APPLICATION

12. Can you please describe what impacts you have or have not seen on the types of projects or clients that may have resulted from the approach's development?

12.1. Does the approach favor certain types of projects?

12.2. Do you see a trend in the types of clients you work with since the adoption of the EBD approach?

13. Research takes time and money, can you please discuss how you make research in practice profitable?

13.1. How do you justify the time/monetary commitment to clients?

13.2. Are you finding that clients are on board with this?

13.3. How do you remain marketable and profitable while maintaining your mission?

PROPAGATION

14. Do you share your research findings with the field?

14.1. Through what means do you share your findings?

14.2. Do you share raw data and/or lessons learned?

15. In our highly competitive and litigious society, sharing how an experimental design strategy failed could damage your reputation and get you into a lot of legal trouble. How do you balance advancing the field's practices and knowledge with the potential risks?

16. Where do you go from here to continue to improve the approach within the firm or improve evidence-based design in the field?

16.1. What do you see as the future of evidence-based design in landscape architecture?

16.2. What do you or other firms need from the field to make evidence-based design more viable or effective?

Additional Triangulation Data

As Yin and Creswell suggest, several data points of varying data collection methods offer more triangulation points for the analysis of case studies. In addition to the interviews, data was also collected through informal on-site observations and review of firm literature. Informal observations were made during each of the firm office visits, during the first round of interviews, to understand some of the physical elements supporting an EBD approach as well as to get a sense of the day-to-day atmosphere in the office. Between the first and second phases of interviews, additional information for the case studies was collected from each of the firms' own publications. Each firm has one or more marketing publications that discuss the history of the firm and include bits of information pertaining to the evolution and application of their evidence-based design approaches. In addition to these internal publications, some of the firms also have published journal and magazine articles related to their approaches. Both forms of firm publications were used to add more triangulation points for analysis of the case studies and provide contextual material describing the setting for the cases (Creswell 2007, 95).

DATA ANALYSIS

Case Study Framework

The case study framework developed inductively and was not set prior to data collection. Qualitative case study research involves "... data analysis that is inductive and establishes patterns or themes" (Creswell 2007, 37). This was true of the data collection and analysis process used in this study. The interview questions were originally developed based on what was learned from the literature review. Once the interviews were transcribed and reflected on, it was decided that each of the four firms had discussed sixteen different topics during their interviews that covered the breadth of professional practice. These sixteen topics were then categorized into four major umbrellas: the EBD approach's background and history, the development of organization and the design culture, professional practice, and influence in the field. These four categories, respectively became Nature and Emergence, Integration, Application, and Propagation to tie the literature directly to what was gleaned from the case study. The two categories, Nature and Emergence, coalesced into one category for the case study framework, which differs from the literature review categories, to discuss a necessary overview of the firm's approach and how it came to be. Thus, it was not until after all interviews were complete that substantial themes were recognized and used to formulate a final case study framework.

The framework in Figure 3.3 was used to ultimately code transcripts and write the findings of each individual case study. The categories were then used as common points to cross-analyze all case studies. Definitions of each category and sub-category are outlined in Figure 3.3

Transcription

Recorded interviews were transcribed using the verbatim method. Pauses, repetition in speech, incomplete sentences, interruptions, laughter, hand motions, stressing words, and filler words were faithfully documented to illustrate the true nature of the casual conversation. When read as a stand-alone transcript, it allows the reader to feel fully present in that conversation.

Coding

The process of coding transcripts involved assigning a three letter code and a highlighting color per subcategory. Phrases in the transcripts were coded using the coding definitions given in the framework in Figure 3.3 as a guide.

Building the Case Study

Phrases from the transcripts and notes taken during the interviews were then organized by category and used as an outline to write the individual case studies. The process of building the case studies was iterative. More information was continually added using the various triangulation data. When a first draft emerged, gaps were identified in each case study and the second interview was conducted.

Cross-Case Analysis

After a draft of each case-study was completed, the cross-case analysis could commence. Using the categories and subcategories from the case study framework, each case was summarized per category and then compared to the other case studies for a cross-case analysis which followed the same framework. A matrix was developed as a summary of findings from this cross-case analysis. As cases were compared to one another per each subcategory, ways to describe and relate certain aspects of the case studies emerged. For instance, comparing each firm's EBD approach by how formal it is. Diagrammatic scales were developed to illustrate these qualifying features and each firm was identified, qualitatively, along this scale in reference to the other firms. This allowed for a meaningful comparison of how each firm is developing and implementing their individual EBD approaches. The process of “working inductively from particulars ...” in each individual case study and in each category, “... to more general perspectives” in the final cross-case analysis allowed the study to ultimately answer the research question (Creswell 2007, 43).

Firm Review

After drafts of the case-studies were completed, each firm received a draft of their own case study to review for factual inaccuracies and proprietary information that should not be published. This was not outlined as a procedure in the IRB application but it was mentioned by the interviewees during interviews that the firms would like this courtesy review. Design Workshop, Sasaki, and OLIN all returned reviews with markups to the researcher. Adjustments to the three firm's case studies were made based on returned comments. These suggestions included paraphrasing quotations to improve flow, correcting personnel names, revising names of tools that had been updated, correctly wording a registered trademark. Mithun was sent a courtesy review but it was not returned.

The case study framework also included contextual information about each firm:

- Firm Name
- Office Locations
- Year of establishment
- Total number of employees
- Number of landscape architects
- Firm philosophy, values, or mission
- Type of work/specialization
- Firm's definition of 'evidence' and 'evidence-based design'

Figure 3.3
Case Study
Framework with
coding definitions
to aid in the coding
process
(Elise Fagan)

Category / Subcategory	Coding Definition	Correlating Interview Questions
Nature + Emergence	<i>What is and what led to the development/ adoption of EBD?</i>	
EBD Approach	<i>What is the firm's evidence-based design approach? Is there a formal strategy? How is evidence used? How does the firm treat evidence in the design process?</i>	1
Finding and Producing Evidence	<i>What types of evidence or data are used? How is evidence produced? Where does the evidence come from? What degree of evidence are they primarily using?</i>	1
Development and Evolution	<i>When did evidence-based design first emerge at the firm? What sparked its emergence? When did the need for a formal strategy emerge? Why? How has the approach evolved since?</i>	2,3,4
Integration	<i>Internally, what's going on at the firms?</i>	
Design Process	<i>What is the firm's evidence-based design process? How is the EBD process integrated into the traditional design process? How is the process made to be efficient? What specific steps of the design process are fundamentally EBD?</i>	1,7,12
Implementation and Components	<i>What are the supporting components to EBD at the firm (ie continuing education, internal resource base, quality manager, sharing information)? How do you ensure the approach is being used effectively?</i>	1,6, 12,13
Firm Organization	<i>How does the implementation of the approach impact project team organization, firm structure? Are there designated positions, leaders, or departments?</i>	6,9,10
Design Culture	<i>How does the approach affect design culture, physical office spaces, communication, creativity? What makes the designers share in the evidence-based design mission?</i>	5,6,7, 8,13

Category / Subcategory	Coding Definition	Correlating Interview Questions
Application	<i>Gets at the business of EBD</i>	
Clients and Client Relations	<i>What types of clients does the firm mostly see? Are certain clients more suitable for an EBD approach? Do the types of clients correlate to the degree of evidence-based design? How is evidence used to leverage decisions and convince clients? How are clients included/ not included in the process? What is the client mentality towards evidence-based design?</i>	11
Types of Projects	<i>What types of projects does the firm apply EBD to? Is the evidence-based design approach affected by the types of projects the firm gets? Or vice-versa? Is the EBD approach scalable to different types of projects?</i>	11
Consultants and Consultant Relations*	<i>What is the relationship between designers and consultants during an EBD approach? What is the role consultants play in the EBD process? How has the relationship between project team and consultants changed? Why is educating the other important?</i>	~12
Marketing	<i>How does the EBD approach change how the firm markets itself?</i>	12
Propagation	<i>Communication & beyond</i>	
Reporting	<i>Is research shared with the field? How? How often does the firm report research findings publicly (beyond the firm or client team) whether through publication or oral presentation?</i>	14,15
Collaboration and Outreach*	<i>What is the relationship between the firm, academia, organizations, and civic institutions?</i>	~14,~15, ~12
Future Trends, Goals, and Fine-Tuning	<i>What are the firm's hopes for continuing to improve the approach within the firm? Or improve EBD in the field? What do they see as future trends in the field related to EBD?</i>	16

*These categories were not anticipated but emerged based on similar discussions occurring in each interview.

Case Studies

Introduction The following four case studies, one for each firm in the study, are organized based on the case study framework shown in Figure 3.3 and are listed here:

DESIGN WORKSHOP
MITHUN
SASAKI ASSOCIATES
OLIN

The framework covers the nature and emergence of the firm's EBD approach, the integration of the EBD approach, the application of the approach, and the propagation of the approach within the firm and its relation to the landscape architecture field as a whole. Each case study opens with basic information about the firm to help frame the study. The four case studies are not in any hierarchical order. Transcripts for the focused interviews can be found in Appendix B.

Design Workshop

Office locations: Denver, CO; Asheville, NC; Aspen, CO; Austin, TX; Chicago, IL; Dubai; Houston, TX; Lake Tahoe, NV; Los Angeles, CA; Shanghai

Year of Establishment: 1969

Total Number of Employees*: 102

Number of Landscape Architecture Staff*: 87

Firm Philosophy, Values, Mission: The workshop: inclusivity, transparency and holism

Type of Work / Specialization: Corridor revitalization, streetscapes, regional planning, parks and open space, new community master plans, community facilitation/design charrettes, high-end residential

Firm's Definition of Evidence: "Evidence is the available information and facts gathered to support an assertion or to indicate that something that has been posited is credible" (Mendenhall 2016).

Firm's Definition of Evidence-Based Design: "Evidence-based design is a project-based process used by designers and planners to make decisions about alternative proposals and verify results based on information available from research, assessments of similar project benchmarks, evaluations of in-progress designs, and measurement of implemented project outcomes through the lenses of environmental, social, economic, and aesthetic sustainability" (Mendenhall 2016).



Figure 4.1 Design Workshop Denver Office (Photo by Elise Fagan)

NATURE + EMERGENCE

EBD Approach

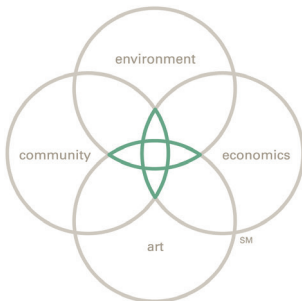
Design Workshop's evidence-based design approach sets up a structured and chronological system to guide a project team in finding, managing, and utilizing evidence to inform design decisions. Allyson Mendenhall, director of Design Workshop's DW Legacy Design® initiative explains that their EBD approach is "about setting up the agenda for the project and for what the team is going to examine" (Mendenhall 2013). The purpose is to outline accountability for the measurement-based goals that are set by the project team along with the client and stakeholders. Kurt Culbertson, the firm's Chairman and CEO, commonly uses the phrase: "what gets measured gets done" (Culbertson 2013).

The approach ultimately establishes "a process of evidence gathering to ideally look at alternatives and how they pass the test" (Mendenhall 2013). Every stage of the process is clearly defined to increase efficiency and establish replicable procedures for the purpose of recreating and comparing projects. Many supporting components have been developed and implemented over the years to reinforce the approach's immediate needs in any one project as well as long-term needs like firm-wide education, communication, and storing of information.

A firm-defined philosophical lens called DW Legacy Design® defines every aspect of the firm, including the evidence-based design approach. The approach and the philosophy are wholly integrated, and each depends on the other to succeed. The following statement from the firm defines their proprietary Legacy Design concept:

Figure 4.2
Design Workshop's
DW Legacy
Design® diagram
(Design Workshop
2007)

DW Legacy Design®



We believe that when environment, art, community, and economics are combined in harmony with the dictates of the land and needs of society, magical places result, places that lift the spirit, sustainable places of beauty, significance, and quality. We are dedicated to designing extraordinary landscapes that leave a legacy for future generations, creating such places for our clients, for society, and for the well-being of our planet. (Design Workshop 2007)

Culbertson elaborates, "out of that philosophy, the notion of measurement and providing evidence that you've achieved the objectives that were set emerges" (Culbertson 2013). Design Workshop's EBD approach is framed by this philosophical lens, Legacy Design, which also frames how they define and use evidence and how the design process achieves that philosophy.

Design Workshop's specific EBD process begins with setting up a clear dilemma and thesis for a project. "You can call that a challenge and a solution, a design problem and a hypothesis, you can translate that in many different ways; [Design Workshop] happens to call it a dilemma and a thesis" (Mendenhall 2013). This exercise aligns the team and "posits a solution at the outset of the project so that [the team] is not just diving in and starting to give form without there being that structure to the investigation" (Mendenhall 2013).

Once the dilemma and thesis for a project are defined by the team, the substantial stages of the EBD approach identify goals and strategies for measuring success. The design teams will identify goals, measurable if possible, for all the pertinent aspects of the project (Mendenhall 2013). These measurable goals could be something like improving tree coverage on a degraded site by 10%. Or it could be a goal to enhance corridor roadways for motorized transit which can be assessed through several different measurable variables (for example, number of parking spaces, transit rider wait times, speed limits). Each goal is derived from and supports one or several of the four Legacy Design foci of economics, environment, community, and art (this process will be explained later in the Design Process section). In subsequent conversations, the team identifies how those quantified goals can be measured, by whom, and with what means (Mendenhall 2013). The firm strives to define specifically *quantifiable* goals (metrics) to allow for measurement of variables and thus create supported design decisions that will have the best chance of succeeding and are thus less disputable in the eyes of stakeholders. Each goal and its associated alternative solutions, metrics, and measurement information are carefully documented in a Sustainability Matrix, allowing the design team to capture the intention and evaluate design alternatives at different stages during design (Mendenhall 2013). The Sustainability Matrix also provides a means of evaluating project success. Mendenhall says that once the project has been implemented, the team should look back and assess if they were successful in what they set out to do. Additionally, how do you prove that success? (Mendenhall 2013).

Overall, Design Workshop's EBD approach is about a clearly defined structure that sets up questions and posits design solutions through measurable evidence. "The idea is trying to think offensively and achieve some verifiable outcomes" (Culbertson 2013). The approach focuses on bringing the project team together to develop the structure of inquiry so that everyone has a shared background and investment. Mendenhall says that it is about putting "a structure and a clarity to how the team goes out and creatively comes up with a design solution" (Mendenhall 2013).

Finding and Producing Evidence

Design Workshop characterizes the types of evidence used to support credible assertions as project-specific and quantifiable. The evidence is measurable in other words. As goals are set for a project, the design team must phrase goals as measurable concepts to allow for benchmarking during the design process and prove performance in the end. Their EBD approach shows a clear cause and effect relationship, making it important to capture the baseline condition for comparison and benchmarking (Mendenhall 2013).

One way teams at Design Workshop are measuring baseline and benchmarking data is by using tools in the firm's Measurement Tools Backpack. Mendenhall explains that this backpack is full of tools related to wind speed, relative humidity, temperature, traffic speed, tree caliper, noise levels among a growing number of other gadgets (Mendenhall 2013). She distinguishes between the casual nature of capturing perceived measurements during a site visit and the rigor offered by using consistent methods with quantitative monitoring tools (Mendenhall 2013). When creating research plans, design teams will often look to existing projects (both within the firm and beyond) to learn what others have done to benchmark (Mendenhall 2013).

Baseline information is also sourced from GIS data for large-scale planning efforts; expert measurement (ecologists doing a species inventory, for instance); or, one of their own specialties, public engagement and crowd-sourcing. Getting community input goes beyond casual conversations; the firm will often retain website builders to develop online digital engagement tools specific to the project (like the Highway 40 Corridor project with MARC in Kansas City). The ability to gather many responses and extrapolate that data spatially becomes very context-specific and goal-specific. The firm has long been known to do this process by hand through dot exercises, where stakeholders prioritize goals or spatial issues and preferences by placing dots next to an area or response. They have evolved this exercise into digital data collection and analysis platforms.

Other forms of evidence used at the firm include articles, websites, and published white-papers. All are stored and shared on their internal wiki, The Portal (this will be further discussed in the Implementation and Components section).

Another form of evidence comes from regulatory agencies. Culbertson notes that in Aspen, for instance, the County and City green building codes lead designers to a metric-based approach. The codes require measuring performance to ensure that

a design complies with the regulatory environment (Culbertson 2013). Design Workshop works within these requirements but then also builds on them because they have an internal goal to improve environmental and economic performance on site through their Legacy Design lens.

The self-measuring aspect of Design Workshop's evidence gathering allows them to list not just features but "translate those features into benefits – how are they benefiting landscape and how is that measurable?" (Mendenhall 2013). Mendenhall states that the firm considers all design to be research in a way, but a design's credibility relies on the practices used to investigate or research features and benefits (Mendenhall 2013).

Development and Evolution

Design Workshop has always had an approach to their design work that was academically intuitive and inclusive. Don Ensign and Joe Porter, the firm's founders, were professors at North Carolina State at the time of the firm's inception in 1969. When they started the firm, they "gave it the name 'Design Workshop' to describe a culture of people working in collaboration" (Steiner, et al. 2013). In the 1990s, the comprehensive Legacy Design approach emerged (balancing environmental, social, economic, and aesthetic goals), in part as response to the sustainability movement and its narrow focus on environmental performance (Design Workshop 2007). Also around 1990, a project team began work on Canyon Forest Village in the Grand Canyon and learned about the emerging U.S. Green Building Council and LEED. Culbertson notes that, at this time, they "began to understand this idea of measured outcomes and performance-based design ... And [Design Workshop] actually took that thinking and expanded it to apply to [their] model and moved beyond just environmental-based outcomes and measurement" (Culbertson 2013). The conversation also identified a significant gap in LEED: an absence of landscape measurement and the performance of systems at scales beyond the building. Design Workshop was ready to fill this gap.

Legacy Design continued to evolve at the firm and work its way into all facets of the comprehensive approach. It was not until 2000, however, that the concept of measurement was readily applied to Legacy Design. Kurt Culbertson wrote a memo to the partners at that time that suggested the idea that "what gets measured gets done" and that they should develop a process of measurement" (Culbertson 2013). At the same time, several of the Design Workshop board members took an interest in the concept of a firm (their own) working to prove success. Mendenhall

suggests this is ultimately where the idea of performance measurement at Design Workshop began (Mendenhall 2013).

The partners wanted to give designers the tools that would allow them to ‘go deep.’ By this, they meant that while a project’s ‘surface’ conditions would identify the critical question of any given project, ‘going deep’ would define the core of that question and lead to investigations into deeper meaning. (Design Workshop 2007)

The need to formalize the concept of ‘going deep’ stemmed from the idea of wanting to be comprehensive: “we want to tackle projects through these four lenses of art, community, environment, and economics; but then how do we gauge success?” (Mendenhall 2013). A small task-force was initially formed to formalize a performance measurement approach using Legacy Design as the guiding concept. “It is in part about growth of the philosophy of Legacy Design ... the notion of measurement and providing evidence that you’ve achieved the objectives that were set” (Culbertson 2013). The firm actually began defining their own set of metrics to evaluate performance around 2005: it was “very, very rudimentary and it doesn’t really look like it looks today” (Mendenhall 2013).

Although the concept of Legacy Design was innate to the firm (because of its similarity to the already-existing Triple Bottom Line¹), adapting the firm to the methodology and process required a campaign for widespread education and implementation within the firm. “It’s amusing to think now, but we realized at a certain point when we were rolling this out ... that people didn’t know what a baseline meant” (referring to baseline performance data) (Mendenhall 2013). An initiative called Legacy Design Days was used across different offices to teach all employees about the new Legacy Design approach, its components, and how to recognize sources of evidence. Although no longer widely used, Design Days was crucial in pilot testing the approach, receiving feedback, and establishing the expected rigor for how the approach should be applied. “In the beginning, we also started having these kind of remote gatherings, whether it’s symposia or lunch-n-learns” to start teaching the basics of applied research in the office (Mendenhall 2013). These sessions included active engagement with drawing and modeling rather than passively seeing a presentation, a tribute to the workshop ideal.

¹ The Triple Bottom Line was first coined by John Elkington in 1994 and is the concept that companies should prepare three separate bottom line action plans for Profit, People, and Planet. Also referenced in the design community as social, economic, and environmental. (Elkington 1997)

Since its initial roll-out, Legacy Design has evolved, becoming more refined and further formalized, a process led by Allyson Mendenhall. When the concept first emerged, the task was largely about developing a process of measurement. Once a rudimentary process was laid out and used a few times to develop consistency, the firm could compare projects of similar types and begin establishing a database of best practices, benchmarking, research methods, and findings. For example, the metrics of several community parks could be compared. Mendenhall points out that “those [comparable] project examples have begun to give us some internal models of even measurement” (Mendenhall 2013). This has allowed the firm to self-evaluate their benchmarking and documentation process, get rid of methods that do not produce comparable findings, and formalize the overall process through internal trial and error.

Other attempts to formalize and define how the Legacy Design approach would be implemented did not make it past the drawing board. At one point, the idea of Forum Leaders was suggested. Across all offices, four people would be designated experts in the four Legacy Design values (economic, social, environmental, aesthetic), with one person per value. For instance, the Forum Leader of economics, would guide teams in developing meaningful economy-related project goals, identify appropriate metrics, help collect relevant literature, and ultimately ensure that economic value shares equal importance to the other three values in any particular project. While the economic recession of 2008-2010 was partly to blame for the abrupt shutting down of this development, the idea was flawed, and the firm realized it. Mendenhall elaborates, “It’s a great ideal to have, but the fact is that the projects tend to be much more team-generated and the knowledge needs to be generated by the team ... [the forum leaders] were more of a top-down ... I think that that shows some evolution of just how the firm decided to approach this” (Mendenhall 2013). Mendenhall suggests that cutting the Forum Leader positions might have been a blessing in disguise because Design Workshop’s culture more strongly aligns with the idea that everybody is responsible for finding and applying the necessary evidence on their projects; they should not rely on someone else to do this for them. This is not to say that leadership for the Legacy Design concept was not conceived differently: Legacy Design Representatives remain one of the longest running internal groups with representatives in the different offices (Mendenhall 2013). These will be discussed later in the Implementation and Components section.

One of the major factors in formalizing Design Workshop’s EBD approach has been increased efficiency in the goal setting and measurement process. “In the

beginning, you'd hear of a team going through item by item and having a long debate and discussion about each item and after eight hours in a room, only getting through [two categories like] community and economics ... we're now to the point where that initial team conversation can take an hour" (Mendenhall 2013). To best optimize everyone's time, the project kick-off process now takes place in three steps: "we lead everybody through an individual exercise, a group exercise, and then a prioritization exercise where [the goals] have to ultimately match the scope and the fee of the project" (Mendenhall 2013).

As the approach became more formalized and replicable, efficiency came with repetition. "We've learned and there are efficiencies in the fact that everybody's now done this however many times on their projects. So that huge learning curve and the days in the conference room at the very beginning [has passed] ... Everyone is much more comfortable with the process and it goes more rapidly" (Mendenhall 2013). The individual learning curve partly determined the approach's efficiency, but approach was also replicable across project types. "We have had some project types like highway corridor revitalization studies, for example, where we now have applied this question of evidence-based design and measurement to multiple examples of similar project types. So we can begin to compare and contrast what works and doesn't work against similar kinds of projects" (Culbertson 2013).

Design Workshop's initiative to formalize the process of goal setting, measurement, and documentation was purposefully pursued to transform the relatively intangible vision of Legacy Design into defined steps. The Legacy Design methodology ensured that the Legacy Design philosophy was implemented comprehensively, so the firm did not simply depend upon people dabbling in the idea. "It is a fundamental philosophy that is driving the firm; we needed to know that it was being applied consistently across the board and that required a little bit of education and commitment to make it happen ... you couldn't green-wash the situation by talking the talk but not walking the walk" (Culbertson 2013).

INTEGRATION

Design Process

Design Workshop's approach to integrating evidence-based design into the design process is characterized as deliberate, directed, and replicable. Just as a scientific experiment has an outlined procedure to produce the intended results, Design Workshop's procedural execution turns lofty goals into purposeful design solutions and measurable results.

True to the firm's workshop culture, their design process begins with a Strategic Kick-Off meeting (SKO). This meeting sets the path for the project by identifying goals, developing a vision (what Design Workshop calls a dilemma and thesis), establishing an interdisciplinary communication network, and looking at desired outcomes from both the project team and client's perspectives. Mendenhall explains, "by gathering everybody at the beginning and setting up these clear goals and clear lines of inquiry for the project ... it actually helps the team to all get behind the same idea" (Mendenhall 2013). As the team disperses and reconvenes over and over, "they all know how it all lines up with the ultimate goal for the project" (Mendenhall 2013).

Early in the project conception, the project team is expected to gather background information and develop a basic understanding of the dilemma and awareness about similar types of projects. The gathering of background information may occur in preparation for the SKO or during the SKO to help prioritize goals; but oftentimes it occurs throughout all phases to inform each step. Mendenhall remembers the older notion of gathering background information as looking for precedent projects and gathering images for a precedent board; "now, I think, designers need to do the same kind of article search, whether that's articles, websites, and other projects' benchmarks" (Mendenhall 2013).

The SKO is also the time to convene the parties that make up a project team. "Our projects are very complex. The teams tend to be multi-disciplinary. If you don't have that agenda or structure, it's very challenging to operate as a team" (Mendenhall 2013). This is the time when everybody (consultants and client included) is led through the three-step goal-identifying exercises that Design Workshop has developed and refined for their own design process. These exercises for goal identification are: individual, group, and prioritization. First, everyone receives four Metrics sheets, one from each Legacy Design concept (see Figure 4.3), rather like a grocery list of potential areas of interest for the project to explore. Everyone individually circles priorities on their own sheets without interruption; this allows the individual to have a voice and to organize their thoughts. The group then comes together and, with large poster-sized versions of the same four Metrics sheets, everyone marks what they had marked on their individual sheets. After the group has discussed why they have circled certain concepts, the last exercise allows everyone participating to place a given number of voting dots on the group's priority concepts. The result is a manageable set of measurable goals from each Legacy Design circle that are set and prioritized and in which the group is invested. Although the ideal is for every project to begin with a SKO meeting, it is not always

Figure 4.3
Metrics Sheets (Jost 2012)



feasible. Small-budget projects and small project teams will include fewer steps.

“What should be part of that kick-off meeting or shortly thereafter is a process of identifying how [the team] would measure [the project's] success and what kind of metrics might be applied to achieving the objectives that are set for the project” (Culbertson 2013). The team will identify strategies for each of the goals previously prioritized and start to define and document the logistics of measuring each, that is, what, who, where, when, how often, etc. in their Sustainability Matrix (Mendenhall 2013).

This live tracking document is shown in simplified form in Figure 4.4. The document and associated process enables the team to evaluate performance in individual goals while also evaluating design alternatives throughout the design process. Culbertson adds that recently, “there’s also been an emphasis in this process on monetizing benefits” (Culbertson 2013). Clients more readily understand cost-savings as a metric and the design team can therefore communicate their design decisions in a common language that enables them to leverage elements of design. The Sustainability Matrix is used mostly to track the measurement process for the team, but it can also be presented to clients as a project update. It is also a useful tool for easily finding performance benefits for marketing and submissions for awards.

After a goal has been tied to a hypothesized measurable outcome and metrics for measurement have been identified (all documented in the project’s Sustainability Matrix), a project team must establish the baseline condition for measurement. Design Workshop aims to “set up the project like it’s a research project ... That’s where [Mendenhall] says, ‘the train can’t leave the station until you’ve set up certain controls and systems’” (Mendenhall 2013). In some cases, baseline condition data are already prevalent when the project comes to the firm. Most times, an issue exists but the quantifiable baseline data must be found. Design Workshop’s performance-based metric approach depends on the gathering of baseline data and comparing that data to the projected or real measurement of the designed condition. This can be done several different ways: data collection from a consultant, firm-collected site data,

Figure 4.4
Abbreviated Sustainability Matrix
(Elise Fagan, adapted from *Design Workshop*)

Legacy Design Principles	Vision	Strategy	Design	Implementation	Operations & Maintenance	Measurement
Economics						
Environment						
Community						
Art						

surveys, existing municipal data, geo-spatial data, etc. (See the Finding and Producing Evidence section). Referring to the Lafitte Greenway project, a 2013 ASLA Award of Excellence winner, Culbertson says, “We took the time, best we could, to gather the baseline

data ... We used those baseline metrics to cross-check the design to see if we had actually achieved what we set out to do” (Culbertson 2013). Throughout the design process, the design team will analyze and benchmark the projected performance of each design implementation (or several options of implementations), each tied to one of the goals documented in the Sustainability Matrix.

While establishing baselines and benchmarking primarily ensure the desired performance of project goals, part of the objective of creating a baseline, a reference mark, is for others to measure the project's post-occupancy performance over time (Culbertson 2013). To protect that goal for long-term measurement, Design Workshop will often involve others in the measurement process. This might mean teaming with communities, academics, or civic entities to take charge of the measurement over time. “There are some other examples like urban wildlife where we may not, in fact, do the ultimate measurement but we’ve created a baseline condition that would allow other academics or others to measure the performance of design over time and see if we achieved what we set out to do” (Culbertson 2013). Design Workshop believes that measurement over time is far more indicative of a project’s continued performance and provides valuable lessons learned when designing legacy projects.

Some may argue that setting up a project like a research project and making design decisions based on data eliminates the creativity of design. Design Workshop, however, believes that this type of problem solving *is* the creative process. Once certain issues are revealed through data analysis and research, the team still must creatively design to solve the issues. Mendenhall declares, “I think it would be difficult for someone to say that that’s not creative” (Mendenhall 2013).

Some clients may also argue that the evidence gathering process is extraneous and not worth the time and money. Devoted to their process, Design Workshop teams

do not think any other way. Their EBD process is now so integral to their work flow that they do not separate the two. “As we’re getting better at integrating this process into our work [we acknowledge] that it’s better to simply have it be part of our process rather than call it out as something separate” (Mendenhall 2013).

Part of getting better at integrating their Legacy Design process is improving efficiency. Simple repetition has made the design process more efficient. “The fact that we’ve taken a number of projects of a given type and people have worked with it quite a bit, I think that is beginning to make it more efficient” (Culbertson 2013). Repetition of the process on similar project types helps to identify the baseline information and the kinds of benchmarks that should be measured. “We’ve had practice and we know how to do it, so it gets faster as we go ... Part of the problem is just trying to figure out where to find the information” (Culbertson 2013). Repetition also generates confidence and motivates designers to continue to apply this rigorous approach.

“[The designers] have taken an evidence-based approach, they’ve been able to measure outcomes, they’ve found that being able to measure outcomes has allowed them to go more deeply and specifically as they’ve explored ideas and it makes them want to do it again ... I think a lot of people, just from experience, have found that the work’s gotten better and their interest in detail has gotten better as they’ve plotted their approach.” (Culbertson 2013)

Design Workshop has implemented a strategically designed and structured process that continues to evolve at the firm. “We’re constantly teaching ourselves how to do this, what the efficiencies are, how to be more rigorous, to use the credible research” (Mendenhall 2013). The firm continues to implement and adjust their design process seeking to improve project performance, think holistically critical, and expand knowledge. “Trying to make sure the research is actually working its way into the next project ... you [have] to be able to see how it translates into better projects every time” (Culbertson 2013).

Implementation and Components

Implementing Design Workshop’s EBD approach and process (as outlined in the previous section) requires several supporting components to ensure replicability and sufficient resources. These components are the SKO, Legacy Design Days, Symposia, and the Portal, all supporting both the process and the designers whose knowledge and resourcefulness is used in each phase. Each component has

been designed, implemented, and altered to help make the approach as efficient and valuable as possible. Overall, the approach and its evolution are supported by changes to the firm’s “philosophy, organizational structure, educational expectations” (Culbertson 2013).

The Strategic Kick-Off (SKO) meeting is one supporting component of the firm’s evidence-based approach. As described in the previous section, the SKO is a strategic planning meeting used to get the design team on the same page, identify the dilemma and thesis, and establish the overall vision and goals for the project. Goals are identified in three steps: individual, team, and prioritization; all of which allow the big ideas to come through while grounding them in reality. Although the SKO is project-centered, it also ensures that a common vision for the firm makes its way into every project.

Another component, no longer widely used, is Legacy Design Days. As previously discussed in the Development and Evolution section, Legacy Design Days were used at the beginning of the initiative to teach the process to the design staff. Mendenhall explains the purpose of Legacy Design Days, “we realized we had to take a step back, teach a process, and teach people: what is a baseline? What is a benchmark? What is a quantified goal?” (Mendenhall 2013). Mendenhall describes these early Legacy Design Days as pencils-down days. People from other offices would travel to be part of the initiation. Those participating would pick a real project that was actually launching and everyone would work on that one project to generate lots of discussion and mutual learning (Mendenhall 2013). Several pencils-down days is a risky undertaking as far as profitability for the firm, but Design Workshop considered it an investment in its employees, its visions, and the firm. While Legacy Design Days no longer occur, primarily due to the economic downturn, the iterative education series laid the foundation for successful implementation of a complex approach across all offices.

Design reviews are another formal component of the firm’s EBD approach. “Basically, it’s like a design review where different like-projects present so that they can learn from each other” (Mendenhall 2013). The firm calls these near mandatory design reviews Symposia where the entire staff takes part in half-day or full-day education sessions on key issues related to the project type on the board. The Legacy Design Representatives (further discussed in the Firm Organization section) together identify one project type for which the firm currently has several projects. They bring in an outside expert or keynote speaker to review real projects and gain a different perspective on the use of evidence in the project. “We try

to target it to a specific project type and then people working on those projects understand the value” (Mendenhall 2013). Each project team is expected to pin-up, present their process thus far, and get suggestions not only on design but how to push their metrics further to improve performance. “It’s the same idea as these Legacy Design Days ... the need to just continue learning within the confines of the firm, not just at conferences ... Part of advancing yourself as a professional is the conversations we convene internally to improve the work” (Mendenhall 2013).

The ideas of continued education and advancing professionally permeate many aspects of the firm and are the guiding principles behind several components of the firm's EBD approach. Lunch-n-learns are a more frequently occurring example of continued education at the firm. “We have a very robust series of lunch-n-learns ... We bring in outside speakers plus we have internal speakers that share topic-based projects, maybe something someone’s researching, etc.” (Mendenhall 2013). More than just the typical product representative presentations, Design Workshop's lunch-n-learns are geared toward evidence, types of evidence, and applying evidence. Lunch-n-learns can also coincide with the Symposia. It could mean “a full-office design review over lunch or it can mean a team really needs the input of two people in the office and they invite them to a design review to get their specific expertise” (Mendenhall 2013).

While Legacy Design Days, Symposia, and lunch-n-learns are valuable for the design staff in that moment and for their current projects, Design Workshop is a long-term visioning firm. And so it came into question: how can we store this information and ensure that it reaches the next generation? In response, an online internal resource base called The Portal was established as a tool for sharing and storing evidence. The Portal is a “vessel that contains the information – it’s about knowledge sharing” (Mendenhall 2013). The Portal is made up of a series of internal wikis that are topic-based and searchable. Although Mendenhall is the ultimate quality control of the site, the content is entirely made of employee contributions and Mendenhall often encourages staff to “not just make withdrawals but deposits” (Mendenhall 2013). Deposits for the firm mean more than just sending around an email blast of an interesting article they just found. “I’m the nudge who always replies back to that person and says, ‘did you consider getting this on the portal?’” (Mendenhall 2013). It is a tool made for the staff by the staff with future staff and other offices in mind. Mendenhall describes why an internal library is important:

The shame would be that if we don't share the research and somebody in Denver learns something wonderful and somebody in Austin next year starts on a very similar project and has no idea that the team in Aspen actually already went down that path ... this is about pausing and understanding when you've encountered some information or generated some information that would be of value to a colleague either immediately or in the future ... It's easy to just always be on to the next deadline and not stop to make sure you're sharing content. (Mendenhall 2013)

The Portal is not only meant for the storing and sharing of retrieved evidence but also for evidence-related project information. "The idea is that it's not just finished work, it's work in progress ... so that we have examples of projects, of a wide variety of project types but also at different stages, not just the complete – here's the final deliverable – but actually here were the tables that they used" (Mendenhall 2013). When the teams reach various milestones on projects, it is expected that they pause to think about what information and lessons learned from the project would be valuable to their colleagues. While The Portal is supplemented by the bulk of project information on the server, The Portal is not just a replication of the server – a primary method of storing information widely used by firms. The projects that are discussed by the Legacy Reps and put on The Portal "are kind of percolating to the top as good examples and then those are going on the portal, not everything" (Mendenhall 2013).

The recording of knowledge has evolved with the evidence-based design approach to increase efficiency. The information is directly relevant to Design Workshop and their specific projects, it was developed and is maintained to be their specific and searchable database of information. "The portal is only as good as the information that's on it and you have to make sure it's current and relevant" (Mendenhall 2013). Therefore The Portal, like all components of the approach, is constantly evolving to meet the needs of the firm. "We continue to evolve the role of information technology ... to become more of information management. So not just about hardware and software but the storage and retrieval of information" (Culbertson 2013).

Each component of Design Workshop's evidence-based design approach supports the process to increase efficiency and replicability, expand knowledge through continuing education, and enhance the project designs by engaging outside experts during critiques. Although each component has been developed and evolved, it is not to say that the components are final products. The firm and

Firm Organization

specifically Mendenhall continue to adapt the components and brainstorm new ones to resolve issues and kinks that arise in the process.

Design Workshop's organization did not significantly change with the adoption or inclusion of the evidence-based design approach; Design Workshop is similar to other horizontally structured firms in that everyone shares a responsibility to be their own expert. However, according to Culbertson, "there's a bit of an organizational chart, organizational structure behind [the approach] to support [it] ... It's shaped some existing roles in a clearer way. But I don't think there's been a whole reordering of the way the company is structured to accommodate it" (Culbertson 2013). Many of these roles, including the Legacy Design director, Legacy Design Representatives, and metrics Champions; were developed and defined to support the ever-expanding approach and all the components it requires. These roles oversee the development of evidence-based design within the firm, manage the quality of design, and ensure that the approach's process is implemented and executed as designed. These roles are also expected to identify deficits in the approach and bring them to the attention of the firm so that they may be acknowledged and strategically amended.

The director of Legacy Design was perhaps the most significant change to Design Workshop's firm organization. The role was established as the Legacy Design approach was being formalized. The first and current director, Allyson Mendenhall, directs the Legacy Design initiative and develops the evidence-based design vision for the firm. Mendenhall describes her role as being "the firm-wide role that is about the teaching and the sharing and getting everybody excited" (Mendenhall 2013). When first hired, Mendenhall primarily conducted and implemented research at the firm. Culbertson elaborates, "I'm actually in discussions with Allyson about evolving what has been more of a research function for her into becoming more of a quality management role. Trying to make sure the research is actually working its way into the next project" (Culbertson 2013). Part of her current quality management control is overseeing that The Portal is current, relevant, and employees are making both "withdrawals and deposits" appropriately.

Another function of Mendenhall's role as director of Legacy Design is being the informal leader of the Legacy Design Representatives. One Legacy Design representative from each office is identified from current staff members to represent the office. "We've actually had Legacy Design Representatives since

2005 I'd say. It's one of the longest running internal groups that has representatives in the different offices" (Mendenhall 2013). Culbertson describes their roles as helping to communicate the intent of the Legacy Design philosophy. For example, "if you don't know exactly where [information] should go [on the portal] or you're forgetting how to do it, you can talk to your Legacy Rep" (Mendenhall 2013). The Legacy Design Representatives also oversee that the approach and its components are being utilized to their fullest potential within their individual offices. In order to do this effectively, the representatives have to self-educate to keep up-to-date on the state of evidence-based design in the field. Mendenhall describes how the representatives are kept accountable for gaining and sharing new knowledge:

[The Legacy Design Representatives] get together monthly ... We share articles; someone will choose an article that everyone reads in advance and then we have a conversation about it. We talk about taking the temperature of the culture of the different offices. And whether design reviews are happening and if they're not how to make them happen; we figure out what the root cause is behind it and nudge everyone to get going again. (Mendenhall 2013)

The Legacy Design Representatives, on their monthly conference calls, will share similar projects to create a common foundation for discussion and input about the metrics and tools that are most beneficial to inform that particular type of design. During these monthly calls, the reps also share and critique commonly used evidence-based design tools like the Landscape Architecture Foundation (LAF)'s benefits toolkit website. "One of the Legacy Reps will discover a new tool, apply it to their project and then share it with the rest of the group to say, 'here's how I think it was successful. Gosh you know, I understand how to use it but it's probably more for projects of a certain scale.' They'll kind of give their assessment of it, which has been very valuable" (Mendenhall 2013). The Legacy Design Representatives are valuable tools who enhance the implementation of the approach within each office as well as being a firm-wide group that specifically focuses on evidence-based design at the firm and how to improve it.

Representation and support from every scale ensures the evidence-based design approach is integrated into the projects and represents the firm's vision. While the Director of Legacy Design oversees the firm-wide implementation and the Legacy Design reps cover office implementation, various roles support the individual project teams. Design Workshop's basic team structure includes a principal in charge, a project manager, and if the project is big enough, a lead designer, and

various project landscape architects and planners. “I think, increasingly, there’s kind of like a “metrics champion” or a “watchdog” on the team ... not every team is big enough to have that person. And so someone on the team might wear many hats. Often it’s the project manager’s responsibility to make sure that the different aspects of our approach are kind of baked into the process and incorporated” (Mendenhall 2013). The metrics champion is often the person to handle the Sustainability Matrix, ensuring that values are assigned at each stage and responsibilities designated. “They’re just the one to say, ‘now wait, we need to stop here before we move any further along and answer some of these questions and get on the same page” (Mendenhall 2013).

There is also a role on the project team that takes charge of ensuring that outcomes are documented. Just as the Legacy Design Representative encourages deposits onto the portal for the office, the metrics champion or project assistant encourages the team to document the information gathered. Mendenhall describes this informal role:

We have a project assistant on projects and it’s this person’s responsibility, among many other things, is to try to capture and gather information produced by the team that potentially goes into an awards submittal in the future, or goes on The Portal because the team did something, found some really amazing information, an article, they produce something that really should be put on The Portal so that everybody has access to it ... I hope that the champion on the team or the project assistant can be that last resort if others aren’t thinking to share the information [on the portal]. (Mendenhall 2013)

As Culbertson mentioned, there is not a significant rearranging of the firm’s structure to formalize the approach but rather a redefining of roles and added responsibilities to existing roles that allow the approach to be integrated seamlessly. The specific steps that make up Design Workshop’s specific evidence-based design process are ultimately the responsibility of the project manager, a role that existed long before the approach.

As discussed previously (in reference to Mendenhall’s evolving role), the role of quality manager is an organizational strategy that is currently being developed and refined. “We have continually tried to design, incorporate and improve upon a quality management function which is not something that a lot of ... certainly not a lot of landscape architecture firms have done ... Evolving the role of quality management is directly related to being more precise and going deeper with the data

and the research” (Culbertson 2013). A quality management role (specific to research and the Legacy Design approach) would move beyond overseeing The Portal and would expand more on evidence gathering, implementation, and incorporation of components (like the Sustainability Matrix) into the design process.

While some roles are currently taking off, others had been conceived but abandoned for various reasons. One of these was the role of Forum Leader (as discussed in the Development and Evolution section):

One idea very early on had been that we would have like a firm-wide lead for each of these areas [economics, environment, community, and art]. And they would be this expert and they would teach everyone and they would bring in speakers and get information on the portal and kind of sprinkle their knowledge amongst different projects ... I mean the idea was flawed. It’s a great ideal to have but the fact is that I think the projects tend to be much more, sort of generated by a team and the knowledge needs to be generated by the team ... It was more of a top-down. Whereas now I think the expectation is that all the teams are tackling their projects comprehensively and there doesn’t need to be a firm-wide expert in environment.” (Mendenhall 2013)

The purposeful designation of this responsibility to the team itself rather than a separate role was a deliberate decision by the firm and it remains consistent with the workshop ideal.

In order to make each of the roles and responsibilities discussed effective, the firm has developed and utilized several inter-office communication strategies and tools. Developing the inter-office communication and collaboration with projects was not difficult however because Design Workshop considers themselves to be *one* firm, not different offices acting as difference entities with different visions. Mendenhall considers the six different offices and says, “we’re very connected ... there’s a lot of pairing of teams connecting the different offices ... sometimes we physically will fly someone to another office where they’re needed” (Mendenhall 2013). The offices also have the ability to connect through video, web conferencing, and conference calls. This happens so often that it’s not unlikely that a designer will have a consulting conference with one office, a lunch-n-learn with all offices on a conference call, and a continuing education webinar all in one day. “There’s a virtual way that the firm operates as well” (Mendenhall 2013).

Much of the success of the evidence-based design approach development and implementation is attributed, both internally and by the firm's peers, to the deeply ingrained design culture at Design Workshop. Mendenhall wrote in the *Architectural Worlds* magazine of Design Workshop's culture: "The collaborative atmosphere and sense of purpose are palpable" (Steiner, et al. 2013). The design culture largely depends on the self-evaluation that occurs within each office, within the project teams, and for the design staff themselves. They are constantly asking themselves: How can we make the design work better? The firm has developed several avenues through which they cultivate their ideal design culture and also ensure its continued vitality. These include professional development, communication, motivation through participation, and physical office space. Developing these avenues also help to attract the next generation of designers to continue the tradition.

Professional development is no exception to Design Workshop's measurement agenda. Like many businesses and firms alike, employees are expected to set professional goals that are both achievable and measurable. These are tracked and accounted for with the support of administration and principals. Unlike many firms however, Design Workshop identifies different types of goals they would like to see their employees fulfill. These include furthering education, various accreditations, public engagement, publishing, representation within the professions, and also outside-the-office volunteerism. As far as representing the firm among the professions, "we tell people they have to go out and speak at conferences and earn their professional development credits" (Mendenhall 2013). "And then somewhat further supporting [the approach] is the notion of the five-year plan, which is a series of educational milestones that each employee is going to try to achieve" (Culbertson 2013). An example of this is LEED certification. The office also encourages each of their designers to have achieved at least a graduate degree and will assist anyone to do so with financial loans. Overall, Mendenhall says that "part of advancing yourself as a professional is the conversations we convene internally to improve the work" (Mendenhall 2013). Each of the professional development efforts are encouraged to ensure quality conversations continue to happen within the office and in the profession.

Several of the strategies previously discussed in the Implementation and Components section not only support the evidence-based design approach but also improve the communication, collaboration, mentorship climate, and design culture as a whole, which in-and-of-itself supports the approach. Culture components include the firm-wide educational events and the technological

improvements to ease communication across offices. “Firm-wide events have helped to model how a team with team members in different offices can use the technology to collaborate ... we can just pick up the phone and get the WebX going and have a conversation” (Mendenhall 2013). More tangibly, “within an office, teams are expected to, every once in a while, get up from their desks, work out in the open space, present to others in the office. And that can happen in many different shapes or forms” (Mendenhall 2013).

The physical office spaces of Design Workshop, while they have not changed drastically over time, are strategically planned and maintained to support the workshop ideal which in turn supports the activities required of the firm’s evidence-based design approach.

It’s got the big open spaces, the huge amount of pinup space because, again, the idea is that everyone needs to not just be at their desk with their blinders on, drawing or engaging with their computer ... The big layout tables where teams can all really roll up their sleeves and get involved ... that really defines every office ... if you look at the way our offices are set up, we’ve got a principal next to an intern and the person who answers the phone at the front desk can probably tell you a fair amount about how we operate and [about] different projects. (Mendenhall 2013)

Mendenhall also writes, "Designs are created and iterated in the common areas ... in the 'public space' of the office ... which in all Design Workshop's offices, are defined by high ceilings, large community tables, and ample wall space where plans and sketches are gathered" (Steiner, et al. 2013). The intentional layout of open studios also encourages the Workshop ideal where team members have chance encounters to engage and converge (Steiner, et al. 2013).

The spatial organization of the office translates to the network of communication as well. “It’s about getting everybody and convening. The team conversations, that I think is where the creativity and ... the synapses start to connect” (Mendenhall 2013). Thus the design culture is strongly supported by physical office space and the quality of relationships and communication that it generates. But Mendenhall makes it clear that this was not a result of the evolving EBD approach, “the physical layout of the spaces is the same because I think that is so based in Workshop. And that’s the idea that carries through with everything we do” (Mendenhall 2013).

With so many components to support the evidence-based design approach and design culture, it would be hard for a designer not to immerse themselves; “there’s sort of an expectation that whatever there is to learn and whatever there is to know out there, you’re going to go seek it or you’re going to go generate it” (Mendenhall 2013). But many firms might ask: “How do I get my designers to *want* to do these things?” As difficult as it may seem, Design Workshop has a simple answer: “It’s part of the culture of the firm ... but we’re also a very devoted bunch” (Mendenhall 2013). Mendenhall also believes that learning has a large part in keeping people excited about doing new things and continuing to push themselves. Learning and curiosity go hand-in-hand at the firm – and for the bottom line, it is what makes the firm profitable. “Just people putting in the extra time because they’re interested in it” is what makes the approach profitable (Culbertson 2013).

Another successful motivating tactic according to Culbertson is that “success breeds success” (Culbertson 2013). When the designers realize that measuring outcomes and following the approach allows them to go more deeply and explore more ideas, they are motivated to do it more often. The integration of the approach into a basic design process also helps to increase participation. “The idea is that it’s stuff that’s on the boards anyway, [the designers] are not creating new material to share with everybody, it’s truly what’s on the boards and we’re going to have a firm-wide conversation about it” (Mendenhall 2013). While a strong design culture certainly helps motivate designers, the firm’s philosophy is not ground-breaking: “we, as an entire design community, want to do the thing that’s right for the project” (Mendenhall 2013). Design Workshop just puts that reasoning into practice.

This notion of why the firm practices the way it does not only cultivates a robust design culture within their offices, but it also is strategically used to attract certain individuals who share that mentality. “You have students that are coming out of school who are familiar with this notion of measurement or the idea of research and much more comfortable dealing with it, maybe than past generations. And they’re coming to expect that kind of intellectual rigor to be brought to bear on problems” (Culbertson 2013). These commendably curious and motivated designers are easier to train on the approach and will more often protect the vision that it supports. Success may breed success, but success also attracts success; thus allowing Design Workshop to hire some of the top-ranked students in their class. Another pool that the firm attracts from is the students participating in the LAF Case Study Investigation (this relationship is discussed

in the Collaboration and Outreach section). Some LAF CSI student participants are coming to be employed at the firm having already learned the processes and expectations that the firm tries so hard to teach people. They are coming in with firm knowledge and the knowledge they have gleaned from the LAF (Mendenhall 2013).

While many of these design culture components may not directly correlate to an aspect of the evidence-based approach, they are components that support the effort indirectly. Design culture at the firm is about asking questions, being curious, putting in the extra time, communicating often and efficiently, constantly learning, reflecting, and then mentoring others to do the same. “The firm has just always believed in this idea that every once in a while, you have to pause and take a step back (Mendenhall 2013).

Design Workshop has strategically designed, implemented, and cultivated a specific design process, supporting component, supporting roles, and a design culture to meet the needs of an ever-evolving evidence-based design approach. The structured and systematic approach has many elements ranging in scope and specificity, but each was created to meet a specific approach-based firm need. In the end, the efforts are implemented to ensure that the design work is the best it can be.

APPLICATION

Client and Client Relations

Design Workshop has attracted a unique clientele over the years. Although Culbertson and Mendenhall claim they have not seen a change in the types of clients they get in relation to the implementation of their evidence-based design approach, some ways in which they communicate and leverage design decisions with clients has changed. Nevertheless, Culbertson thinks “there are clients who have legitimate interest in performance-based design” (Culbertson 2013).

Culbertson and Mendenhall acknowledge that while they can certainly adapt their approach to meet different clients’ needs, even reluctant clients, there are types of clients who are inherently better suited for an evidence-based design approach: “[public clients, municipal clients, developers, and the business improvement districts] want to know how their project is performing ... they have a mandate to report ... and so they’re all over this idea” (Mendenhall 2013). The firm finds that public and civic clients who already have to report and publish measurable performance outcomes are first of all more accepting of a design process focused

around metrics, and secondly they have the capacity to work with the firm to help collect baseline information and continue to measure after build-out.

Design Workshop has a wide range of client types which helps to better assess where the approach's strengths and weaknesses lie. Mendenhall admits: "I think that [the evidence-based design approach] has been a more challenging discussion in some ways with our residential clients ... they're interested in seeing energy or water bills go down. But there's been less interest in an overt process" (Mendenhall 2013). While it can be frustrating to have a client be uninterested in paying for or participating in the firm's signature process, the vision is so ingrained in the designers, that "sometimes we just do it internally anyway (Mendenhall 2013). The belief is that the process makes for better and more holistic projects, whether the client is involved or not.

A risky part of evidence-based design in professional practice is that it costs money and is time intensive. This can cause any client type to be reluctant. Culbertson even admits, "I don't think at the end of the day you're going to get a client to pay extra for [the research portion] ... You're in a competitive environment and so if the client is shopping prices, it can't be more expensive ..." (Culbertson 2013). Design Workshop's deeply integrated approach offers a loophole however:

When we first started this, it meant a metrics exercise might have been a separate component of a contract ... as we're getting better at integrating this process into our work, it's better [for it to] just simply be part of our process rather than call it out as something separate. Because then it's seen as something separate and has a separate fee or line-item that a client can say, "I don't want to pay for that." And so it's kind of like not even giving them the option anymore ... as we're just sort of incorporating this into scope. It's less [of a] risk that it's going to be on the chopping block. (Mendenhall 2013)

This inclusive contract entity protects the evidence-based design aspect in every project but also raises the design fees across the board for the firm. For the clients who specifically seek out Design Workshop's expertise and Legacy projects, this is not a problem, "[the clients] see the outcomes getting better ... they see a quality outcome and to a certain extent they may not care how you got there but if they understand that maybe research was part of the puzzle, then they see the benefits" (Culbertson 2013). The transparency of the process and the details of the time and fees it may incur depend on the receptiveness of the client.

I think there are probably times when a team really wants to tackle something on a project and the client's not entirely behind it and we probably have it be kind of a secret hidden agenda that we're trying ... that we're interested in pursuing something for the benefit of the project, that's going to make its way into the project. Now could we point to exactly where the client is paying for it? No. (Mendenhall 2013)

This is, however, not how the firm chooses to practice and they are always encouraging their clients to be involved in the project. "This isn't about us cooking up something and knowing what's best for a client – this is very inclusive" (Mendenhall 2013). The approach is just as much dependent on process as it is communication – and client communication is vital. "The idea of workshop ... is being inclusive and transparent ... we are all about these conversations with the client" (Mendenhall 2013). The three-step process of the SKO is an example of where client involvement is designed right into the design process. The team can invite the client to participate in some or all of these steps, or at least show the client the process they went through to identify priority goals by saying "we went through this exercise and you can see that we're all over the place, we've circled all these things that we thought were relevant to your project, but here are the few we came up with that we think are the priority" (Mendenhall 2013).

Another way to indirectly involve the client in the process is for the design team to do the initial investigating to figure out which goals might be priorities for them. "We always tell teams: 'either have a direct conversation with the client, go to their website – often companies or universities, they'll have their stewardship goals or their mission on there – it's public. Either have the direct conversation or do the research to understand your client and how our sense of what the sustainability goals should be for the project'" (Mendenhall 2013). This can foreshadow some of the things a client might respond to when presented with the SKO discussion findings.

This easy initial investigation can also be a tactic to convince clients that certain goals are important to address. Mendenhall describes the following situation as an example:

"[The project team was] getting signals from a client that they weren't really interested. The client's probably thinking, 'well, is this extra? How much?' And [the project team] brought sort of the messy results of the team [SKO] exercise, but it also then had been put through the sieve and the priority

goals for the project had sort of made [their] way to a more clear matrix format ... And then we showed how you could draw a line from each of the things we identified that should be researched ,or performance areas on the project, and how they matched what their ... the company (it's a developer), what their stewardship goals were. And so they go, 'Oh wow! You totally get us. You understand us. And you're right; we are in the business of recording outcomes. So this makes sense that the design consultants should do the same thing that we are. Our quarterly shareholders are expecting to hear measurable information and what the outcome of something is. Yeah, this is great.' So I think it's partly educating the client as well. (Mendenhall 2013)

Oftentimes, it is the idea of monetized performance benefits that will convince a client that certain measurement protocol must occur in order to design accordingly and optimize the financial performance of a project. Culbertson describes the "emphasis in this process on monetizing benefits ... I think that clients understand the benefit of monetizing information right? So if you can say, 'we're conserving water or we're conserving energy ...' and you can translate that into financial savings or financial benefits for them, they get that as well (Culbertson 2013). Clients are also more likely to make the leap to understanding environmental and community benefits if they see the value of associated financial benefits; "they understand the idea of performance in general because they're interested in financial performance" (Culbertson 2013).

I think continuing to monetize results so we can communicate to clients in a way that they understand, that it's having a legitimate economic benefit for them whether we're pursuing community benefits or environmental benefits, but it helps to be able to monetize it to communicate to the client that it translates into funds for them. (Culbertson 2013)

Communicating the benefit of the evidence-based design process is crucial to a successful approach – no clients, no work, no approach. Communication of performance and findings is also critical to producing what the client was convinced of in the first place. Clear graphics to communicate certain points of evidence or metrics "helps to have the conversation and make the case with a broader constituency whether it's a client, or going to community meetings ... So in addition to the words that go with ... the proposal, there's the graphics that can help to tell the story" (Mendenhall 2013).

Types of Projects

While the firm has not seen a distinctive shift in the types of clients they receive due to the emergence of the evidence-based design approach; communication efforts, contractual tactics, and prioritization convincing strategies have developed. “But I will say that I think we have found clients to be very interested and accepting of the idea of evidence-based design” (Culbertson 2013).

The types of projects that Design Workshop’s EBD approach lends itself to are self-described as complex. “Embracing the complexity of its typical projects, Design Workshop has embarked on an effort not only to gather information to aid design decisions and inform the best practices of the firm but also to conduct formal research that generates new knowledge for the profession” (Steiner, et al. 2013) These complex projects that work well with the Legacy Design approach tend to be the streetscape, highway corridor planning, and corridor revitalization studies (Culbertson 2013; Mendenhall 2013). The firm has also seen profound impacts on their master planning community projects in California, New Mexico, and Utah due to the water savings alone. Mendenhall also notes that these complex projects tend to have multi-disciplinary teams. Project types (and clients) that seem to have the most interest in performance measurement and documentation process are the municipal and business improvement district projects. Mendenhall mentions that it has been easier to have conversations with these associated clients and stakeholder groups because they often need to report on performance as part of their operation (Mendenhall 2013).

Design Workshop has been practicing their Legacy Design approach long enough and made enough revisions that they now have a greater comfort level and more focus on scaling the effort to the scope and fee of various projects (Mendenhall 2013). There is also an effort to apply “this question of evidence-based design and measurement to multiple examples of similar project types” so that they can compare metrics across projects to gauge benchmarking and performance holistically on certain project types (Culbertson 2013).

One project type that the firm recognizes is difficult to apply an EBD process to is their residential projects. Culbertson points out that “[residential clients’] primary concern is, ‘is my project on budget? Does it look beautiful?’ They may or may not have environmental concerns to varying degrees. And generally community concerns are not an issue in private residences” (Culbertson 2013). Design Workshop is readily trying to fill this gap in research though as they are the first to have residential projects as Case Studies in Landscape Architecture Foundation (LAF)’s Landscape

Consultants and Consultant Relations

Performance Series (LPS). When Mendenhall first investigated the possibility, she went to the LAF website and noticed that there was not a residential category in the case studies. She initially thought, “well is that because they don't want any residential projects or because it is a scale issue? And it turns out just nobody had ever submitted those or proposed those. So we thought, let's see what happens” (Mendenhall 2013). Design Workshop added three residential case studies to the LPS in 2013.

The relationship Design Workshop has with their consultants is characterized by education and collaboration. The design teams make an effort to carry their idea of the workshop – being inclusive and transparent – to the consultant teams where they typically are “really pleased to be a part of the conversation” (Mendenhall 2013). Mendenhall describes that it is very exciting for the design team to have that kind of enthusiasm from other sub-consultants because it means that they are not only recognizing the value of the project going through this process but they are genuinely interested in the performance outcomes it produces (Mendenhall 2013). One thing to be learned from consultant collaboration in Design Workshop's EBD process is that identifying who is actually responsible for measuring and taking performance-based design implementations to the finish line is incredibly important, especially where there are a lot of goals and a lot of team members to organize (Mendenhall 2013).

Not all of Design Workshop's consultants are always so enthusiastic about the EBD process however. Mendenhall mentions that sometimes it is hard to get consultants to think that way and on one particular project, she recalls, it was because the client was insistent on the EBD process that the consultants ultimately jumped on board (Mendenhall 2013).

Design Workshop's Legacy Design process is so refined and has received such positive reviews in the industry that they have actually obtained a couple of contracts based solely on the process. Mendenhall points out, “it doesn't happen *that* often, but it's happened, I'd say, half a dozen times in the last few years” (Mendenhall 2013). In one instance, Design Workshop was not even the lead consultant on the project but because they have experience leading a team through their performance-driven goal setting exercise to figure out how a project can be more sustainable and how that can be measured at the outcome, they were awarded a separate scope (in addition to being the landscape architect) to take the entire consultant team through their process (Mendenhall 2013). It was a process of educating the consultants in a complex process and getting them to buy into

the same vision, similar to how the firm educated their own employees through Legacy Design Days during the early years of the approach.

Marketing

Design Workshop's EBD approach, Legacy Design, is so ingrained in what they do that it is the essence of how they market themselves. Mendenhall states that it is innately "related to the brand of the firm ... how we differentiate ourselves" (Mendenhall 2013). She even goes on to say that although they are thrilled that the way they practice is better for the work itself, the earth, and society; they would not be doing Legacy Design if they did not think it was beneficial to how they are perceived and their ability to win work (Mendenhall 2013). The approach simply markets itself and they have clients coming to *them* specifically seeking that approach out. The example described in the Consultants section about the firm winning a separate scope contract just for leading the process is an example of the approach's marketability. Mendenhall says, "it's nice to hear clients say, 'we know your firm is doing this, will you do it for us as well?' It's nice to be recognized [for the approach]" (Mendenhall 2013). The firm's existing clients generally find their approach and the work it produces to be valuable; and because of the transparency and inclusivity of the firm's process, clients often return with more work. Culbertson comments that proving to be a leader in the field has definitely reaped some positive financial benefits for the firm (Culbertson 2013).

Not only is the firm winning work off of their EBD approach but they see that, by sharing their approach and research with the field, it helps build their brand and reputation in a way that is attracting potential new hires as well (Culbertson 2013). Hiring skilled designers with unique expertise or work ethic simply adds to the firm's ability to produce high level work which feeds back into their marketability.

PROPAGATION

Reporting

Design Workshop is very active in reporting research findings and teaching the field about their Legacy Design process. The firm does this by publishing through various means, presenting, and collaborating with organizations. When asked whether the firm was nervous about sharing proprietary information about their process or possibly sharing research that suggests they might not have achieved the performance they set out to, Mendenhall responds that "the idea of publishing and speaking at conferences is ultimately to make the work better ... we're not too closeted about our approach" (Mendenhall 2013). The "work" she describes is the work that the profession produces as a whole. "Part of [sharing research with the

field] is just for the good of the order. [Design Workshop] considers it valuable to try to help improve the profession” (Culbertson 2013). One of the contributors to the Architectural World's 2013 spotlight piece on Design Workshop, Fritz Steiner, applauded the firm saying, "through publication, Design Workshop not only expresses its own ideas but also contributes to professional discoveries and allows for the critique and examination of its projects ... Writing about one's own work, perhaps, forms the purest form of reflection" (Steiner, et al. 2013).

Design Workshop and its employees have published in journals, trade magazines, on websites, blogs, and have even published three of their own books. Many of these reach international audiences. The majority of the firm's publications mention, to some degree, their Legacy Design approach, research, and/or evidence-based design. This is simply because the purpose of publishing is to fill a gap in the knowledge base; the firm's innovations in practice and process are things others are not doing and are interested in reading about. Publications range from the firm being the sole author or their project/research being the sole topic of the publication to employees being one of several authors or the firm's project/research being one of several case studies. Examples of where Design Workshop and its employees have published are:

- Architectural Worlds (aka World Architecture Review) – several authors including allied academics assessed Design Workshop's EBD approach
- Edinburgh Architectural Review – Kurt Culbertson – used Lafitte Greenway as the basis for a case study
- Landscape Architecture Magazine
- Landscape Architecture Foundation – contributed nine case studies in the Landscape Performance Series alongside academic teams (Blue Hole Regional Park, Riverside Ranch, Capitol Valley Ranch, Cascade Garden, Park Avenue/US 50 Phase 1 Redevelopment, South Grand Boulevard Great Streets Initiative, Cherry Creek North Improvements and Fillmore Plaza, Daybreak Community, High Desert Community)
- Planning Magazine
- Land8
- Three books – The firm's third book, Towards Legacy, specifically highlights their EBD approach

The employees at Design Workshop have also presented at various conferences and through webinars. The firm highly supports and encourages their employees

to be active voices in their fields; it is what supports their brand and makes them a leading landscape architecture and planning firm. Examples of forums in which Design Workshop employees have presented include:

- American Planning Association's (APA) National Planning Conference
- American Society of Landscape Architect's (ASLA) Annual Meeting and Expo
- Council of Educators in Landscape Architecture (CELA) Conference – Mendenhall points out that Culbertson was one of the first practitioners to attend CELA regularly.

Collaboration and Outreach

As is branded in its name, Design Workshop continuously looks for the workshop relationship and will often reach beyond the firm to other professional organizations and academic institutions. Mendenhall reports, “we're trying to make forays into these different [research] areas and I think it largely needs to happen through partnerships” (Mendenhall 2013). As it relates to EBD and research, the firm has collaborated with the Landscape Architecture Foundation (LAF) as repeat participants in the Landscape Performance Series (LPS) while the firm’s academic relationships include Design Days and having student and faculty in residence programs.

Design Workshop recognizes LAF as becoming a convener and compiler of information for the field of landscape architecture. The firm, therefore and undoubtedly, has a keen interest in contributing to that compilation of information in the effort to positively influence the field but also to reap the benefits of a continuously growing library of knowledge driven by a “you give what you take” philosophy. LAF’s LPS Case Study Investigation (CSI) pairs academic teams with practicing project teams to evaluate and document performance benefits on specific projects. Design Workshop has participated with three projects each year since 2011. Mendenhall sees this piloted partnership as beneficial because “very seldom can firms pay for, or take the time for their own post-occupation [and] post user surveys” (Mendenhall 2013). The academic team makeup is also significant in that it is made up of one faculty and at least one graduate or PhD student. The faculty member brings experience, new methods, and rigor but the student is often the important bridge between having their foot still in that academic door while also being on their way into the practitioner world (Culbertson 2013). Mendenhall even notes that the students who participate in LAF CSI end up graduating and often ending up at the same firm which allows them to enter the practice having

already experienced performance documentation and the firm's culture. "You're always going to have a case of old dogs needing to learn new tricks. Well these [graduating students] are the new dogs coming in, the young dogs, and they know the tricks, they're coming in with that knowledge" (Mendenhall 2013). The LAF CSI is heralded a much needed mutual relationship; the academics have access to real, built projects and the project teams in turn learn about some research and documentation methods including what questions need to be asked which goes on to inform their next project.

Beyond the match-making type of relationship with academia where a third party is involved, Design Workshop has several direct relationships with academia. Culbertson explains the benefit of this relationship saying:

In theory, academics are trained researchers, they know how to do research well. And so there is the potential for an objective third party [academic] relationship where academics may do post-construction evaluation or review [the firm's] work or conduct new research to validate whether the kinds of design interventions that come to bear actually yield results. And that may be better accomplished by partnering with academics than trying to generate the research on our own. So I think for all of those reasons, we've been trying to create these partnership arrangements. (Culbertson 2013)

Mendenhall warns however that "there have been cases where the practitioners think the academics know how to do all this measurement and they know how to set up the research and [that it's] obviously very rigorous and they have certain practices that they're held accountable for. But they don't know how to measure everything" (Mendenhall 2013). The relationship therefore needs to be mutually curious for the most beneficial research plan to evolve and for the needed questions to be answered.

One example of the firm seeking out academic partnerships is the Lafitte Greenway project where academics at the university were brought on to help measure some of the more social and community-type metrics. These measurements were meant to be ongoing and so the academic team was that ongoing presence to continue to conduct research and data collection (Mendenhall 2013). Another example is the Daybreak community in South Jordan, Utah. Although designed by Design Workshop, an academic team chose to author a paper on a study of children walking to school in the neighborhood

for which the firm was eager to provide information and assistance (Mendenhall 2013). The firm also hosts occasional faculty-in-residence programs to bring relevant research topics into the firm and give faculty access to real projects to evaluate.

Culbertson is finding that academic programs throughout the country are increasingly implementing more research-oriented curriculum than they have before. Students are therefore “coming out of school more familiar with the notion of measurement and the idea of research and are much more comfortable dealing with it than past generations. They're coming to expect that kind of intellectual rigor to be brought to bear on problems” (Culbertson 2013). To help with and build on this evolution, Design Workshop will occasionally engage with students on various efforts. “[Kurt Culbertson] gets calls with some frequency from students who are in search of a thesis topic or a dissertation topic and they want it to be something relevant to practitioners ... [They ask], ‘well what would be helpful so I'm not doing this from my academic standpoint but not understanding how it translates?’ (Mendenhall 2013). The firm’s rigorous student internships also expose interested students to research in practice in the hopes that they will apply their experiences in the last years of school and on into their professional careers.

The last example of Design Workshop’s collaboration with students is Design Week. A team from the firm will travel to a university and conduct a week-long design charrette with student teams on a planning dilemma on or close to campus. The work is rarely related to anything billable back at the office but Design Workshop finds it important to do what they can to bridge that gap between academia and practice; the firm therefore does this voluntarily to benefit the students’ education and exposure. It is an investment in the students and in the profession as a whole which Design Workshop hopes will in-turn elevate their own work.

Future Trends, Goals, and Fine-Tuning

Moving forward, Design Workshop admits that they are still very much learning from and growing their EBD approach. Mendenhall describes where the firm is at as being “glass half full ... we're always trying to be better. And it's a process” (Mendenhall 2013). Culbertson references Jim Collins’ theoretical framework, the Flywheel Effect: “it's just improving everything little by little and making it better” (Culbertson 2013). Both Culbertson and Mendenhall speak of fine-tuning their process, making the process more efficient and profitable, ensuring better baseline measurement, and becoming better practice-based researchers. This also extends

to what Design Workshop hopes to see in the profession in order to advance EBD. In order for other firms to make EBD more viable in their own work, Design Workshop targets the profession's body of knowledge and partnerships as needing to expand and improve. Overall, the growth begins with learning the importance of having information, "to take the research that's being done and to continually focus on how it's going to improve the next project ... That we can convince ourselves, and we're confident, that it's leading to better projects" (Culbertson 2013).

As for improving their internal process, Culbertson identifies profitability as a target for improvement that the firm has already enhanced drastically from the beginning. Mendenhall wants to see that the Strategic Kick-Off (SKO) meetings are happening more regularly and that they are proving to be beneficial. She says, "making sure we have that initial conversation. Or if we have it, that we have it early enough to really inform the direction of the work" (Mendenhall 2013). Mendenhall also acknowledges room for improvement in sharing internally, specifically on the Portal. Additionally, better baseline measurement is an issue discussed both internally and with the firm's collaborators like LAF. Mendenhall explains, "[baseline measurement] is a place where there's a lot of interest in having a more in-depth, advanced site visit that captures a lot more information and maybe, over time, to set up some monitoring to understand [the ongoing] performance" (Mendenhall 2013). Mendenhall gives LAF credit for holding several webinars as part of the LAF CSI focused solely on gathering better baselines. There has been continued discussion among the LAF and CSI teams about the academic teams requiring baselines that simply are not captured by the firms and they they are being asked to assess baselines (Mendenhall 2013). This situation motivates Design Workshop to improve consistency and rigor of their own baseline measurements.

The issue of practitioners not capturing baselines on their projects relates to Mendenhall and Culbertson's general belief that landscape architects need to become better researchers. Culbertson admits, "I think part of it is landscape architects in general are not good, trained researchers ... I don't know that people have the fundamental educational background to do great research. And I don't know that the benefits of doing research and evidence-based design have been demonstrated to people" (Culbertson 2013). Culbertson sees a varying range of research-capable employees come to Design Workshop. The challenge, however, is that they are not experienced at applying that research to the work. "On the one hand you have people who know how to practice but they don't know how

to do research and on the other hand you have people who know how to research but they don't know how to practice. So [the firm is] trying to develop a rare combination of folks who have figured out how to do both” (Culbertson 2013). Mendenhall says that simply more partnerships between academia and practice would allow one party to fill a gap where the other is in need and vice versa.

Another area of improvement for both the profession and academia is bettering measurement both in terms of figuring out how to measure intangible things like social and community variables and developing consistent measuring methods including the education to support that. Academics participating in the LAF CSI, Mendenhall mentions, have admitted that they just do not necessarily know how to measure certain aspects of the site and what the best practices are for those lines of inquiry (Mendenhall 2013). LAF is also realizing that they may need to “provide some training to academics on how to conduct certain types of studies” (Mendenhall 2013). Overall, Design Workshop has identified a large gap that the landscape architecture field will need to address in order to work towards more widespread use of EBD in practice.

With regards to expanding the use of EBD in practice, Culbertson and Mendenhall recognize some major hurdles. Culbertson estimates that probably ten percent or less of firms practice with a formal EBD approach. Culbertson adds, “I think that firms have a hard time operating profitably in the first case. And so they probably don't understand how to put the extra time in to do research without it negatively impacting their financial performance” (Culbertson 2013). On top of that, they may not know how to go about an EBD process even if they wanted to, they might not feel credible or trained properly to do it and ultimately they talk themselves out of recognizing EBD's benefit to their project worth (Culbertson 2013). The profession is however seeing a shift. Culbertson believes that EBD is evolving “in part because this question of measurement is being more widely accepted by the profession ... It's still a long way from being a universal model of practice. There are a handful of firms that I think are serious about the question of research and evidence-based design beyond something like LEED or Sustainable Sites” (Culbertson 2013).

Overall, Design Workshop recognizes that they are not done yet and there is always something more to learn and improve. Moreover, there is much for the profession and supporting organizations to improve upon in order to make EBD feasible for the majority of practitioners.

Mithun

Office locations: Seattle, WA; San Francisco, CA

Year of Establishment: 1949

Total Number of Employees*: 129

Number of Landscape Architecture Staff*: 12

Firm Philosophy, Values, Mission: "Our design has purpose, to create positive change in people's lives. We believe in design's vital capacity to connect people to place and each other through intentional and memorable experiences. We are committed to design's ability to anticipate and address the challenges of the future" (Mithun 2016).

Type of Work / Specialization: Urban mixed-use, university housing, education

Firm's Definition of Evidence: Measurable data, supported claims, quantified performance (Runge 2014), information, discoveries (Guenther 2013), best practices, and lessons learned (Higgins 2013).

Firm's Definition of Evidence-Based Design: The use of evidence as a baseline, in combination with creativity and intuition, to make decisions (Runge 2013). "By committing to rating systems, we commit to evidence-based design" (Guenther 2013).



Figure 4.5 Mithun Seattle Office (Photo by Elise Fagan)

NATURE + EMERGENCE

EBD Approach

Mithun's evidence-based design approach relies largely on the use of rating systems, certification programs, and regionally specific code requirements to identify evidence-based design opportunities as well as leverage decision-making. Deb Guenther is a Mithun partner, principal of the landscape architecture team, and a head-strong voice for evidence-based design in the field. While describing the approach, she says that "our urge is always to take this comprehensive approach; that everything is important. We want to pursue every factor. And I think we've discovered, over time, that each project has a trigger or a thing that pushes innovation in a certain area" (Guenther 2013). Christian Runge and Noelle Higgins² are both LEED certified landscape architects with focuses in sustainability. Runge disagrees that Mithun's approach is formal, "there are a lot of expectations just through the conversations that we have as teams, through the crits that we do in the office that sort of set the bar and ask the questions about why is it this way or what information do you have to back that up? There's a lot of that kind of conversation but it's not necessarily formally integrated" (Runge 2013). Runge and Higgins contributed to the conversation as a tandem while Guenther was interviewed on a separate occasion over the phone.

All three interviewees emphasized the importance that rating systems play in convincing clients to buy into a vision using methods they typically are unfamiliar with. National rating systems such as LEED, SITES, and WELL are metrics-based frameworks that offer an organized and consistent means to measure, document, and assess the degree to which a design is sustainable or healthy (depending on the rating system). Rating systems are assumed to base their requirements off of valid research³ and their "points" therefore are considered best practices. Since the research has already presumably been done to determine that any particular point achieves a best practice, the rating system concept offers design teams a way to measure and track a wide range of metrics with brief depth. This allows firms like Mithun to concentrate their efforts on goals (or "points") that lend themselves to new, innovative research and design solutions. Rating systems are also a way to get everyone, client and design team, on the same page. And while there is an undeniable emphasis on the use of rating systems at Mithun, they are merely the starting point in an entrepreneurial culture seeking to always push the limits. The thought is that if a client is committed (meaning invested in the process financially and time-wise in order to receive the seal of certification at

² As of publication date, Noelle Higgins is no longer an employee at Mithun.

³ The credibility with which LEED, SITES, and WELL base their requirements off of valid research varies and sources are not necessarily cited.

the end) to a rating system such as LEED, SITES, or Salmon Safe (a regional rating system); then they are also committed to the design implementations that achieve those minimum requirements. “If people commit to those rating systems, they’re committing to evidence-based design. And so that means everybody’s behind it and everyone’s kind of on the same page” (Guenther 2013). This perspective not only applies to keeping the client accountable but also the project team itself. “[Rating systems] have a really important role in motivating everyone on the project ... they’re a really good hammer (*laughs*) and you kind of need a hammer to get everyone moving in the same direction. And that’s been extremely powerful” (Guenther 2013).

Rating systems are sometimes used as a defensive approach at Mithun: “[certifications] are all good to help us to sort of protect our budget ... and protect the integrity, ... the design of the project” (Higgins 2013). This not only allows Mithun’s designers to leverage basic sustainable design decisions but it also helps them to act offensively and focus on other aspects beyond the rating system or code requirements. Higgins gives an example of rating systems protecting basic amenities that the design team already knows is a best practice, thus allowing them to focus on more innovative goals that move the profession forward: “without having to argue about how many trees you have on your project, you can move forward with that as an assumption, as a given. Your building is going to have walls and your site’s going to have trees” (Higgins 2013). Mithun utilizes the rating systems as a baseline expectation, allows them to tackle more complex projects whose answers do not lie within simplified and generic “points”. Runge elaborates:

Look at SITES, we’re using it both to determine whether we’re applicable to something like SITES or LEED and whether we can go after it at say the schematic design phase. But we also use it as kind of a means to determine what we might be able to achieve on a project as our own internal firm goals. And usually it’s pretty helpful to use tools like that because it’s already pretty well established; the framework is established and it’s kind of a great place to start. And then based on the project we might go in different directions and we might feel the need to kind of go into more depth and go into kind of creating more of a unique process. (Runge 2013)

Mithun has integrated so many rating-system-based performance criteria into their designs that once-rare design components like bioswales or water reuse are now considered a rule of thumb for all projects at Mithun. The rating-system-inspired

Finding and Producing Evidence

metrics have become their own set of best practices at the firm with the designers becoming experts in their own right on such implementations.

The ways in which Mithun projects are informed by evidence is more people-based and qualitative than studies-based or quantitative. For example, firm often relies on the expertise of Guenther, best practices learned from the office, academic experts, or consultants, and only in rare cases produces original evidence. Mithun does however acknowledge the important balance of degrees of evidence. “Our overall approach would be sort of, almost like a mutual feedback pattern using evidence and also design intuition together at the same time and having them respond to each other and having them work off each other throughout the entire process ... One extreme would be where you’re only using science and evidence to make decisions and another would be only using design intuition to make design decisions ... We’re trying to kind of try to find a balance between the two at all of the phases of the project and so we’re using evidence to inform design, and we’re trying to be creative and use our own intuition as well” (Runge 2013). Other types of evidence used at Mithun include:

- Lessons learned from previous projects
- Details and specifications from previous projects (specs can be a type of evidence from manufacturers about products and methods)
- Experience of team members and others at the office
- Product representatives
- Precedent projects (from LAM, ASLA awards)
- Best practices from the office

In addition to these types of evidence, Runge and Higgins notes that they believe that the licensing process itself “is very rigorous and so that is another evidence base” (Runge 2013). Licensing may be seen this way because it a process of certifying professionals in landscape architecture which may be considered an expertise in its own right.

Mithun's design process is characterized by the application of an existing framework for measuring performance. There are, however, *various* rating systems, certifications, and code requirements that Mithun employs as the structure for measuring performance. Figure 4.6 illustrates examples of the rating systems they most often use, some of them being widely-known international systems and some being specific to the Pacific Northwest region or Seattle locality.

Figure 4.6
Rating and
Certification System
examples
(Elise Fagan)



Mithun’s geographic location in Washington (and the Pacific Northwest) presents an opportunity to utilize unique regional certification systems that are not applicable in other parts of the country. Guenther comments that they have the good fortune of having codes and requirements in Seattle that already support the firm’s own goals. For example, there is a Director’s Rule⁴ in Seattle to keep one hundred percent of stormwater on site because any runoff is going to go into the Puget Sound and create problems (Guenther 2013). This example shows a regulatory agency’s codes, another means by which Mithun can actively seek out evidence to use in their EBD process – an opportunity most firms in other states have to look for elsewhere.

The frameworks from these rating systems, certifications, and code requirements provide the measurable outcomes and units of measurement that Mithun can then use to evaluate project goals. By going through this process, Mithun is able to document proof that their project is performing to any particular framework’s certified level. It is an existing structure with which Mithun can frame their preferred modes of evidence gathering.

Development and Evolution

The development of Mithun’s EBD approach is characterized by academic roots and its evolution is closely tied to the emergence and evolution of performance certification systems developing throughout the world.

The firm was born from the academic sector. Omer Mithun was a professor of architecture at the University of Washington at the time he first opened the firm in Bellevue in 1949 (Macaulay 2008). With a staff of former students, the fledgling firm implemented what Mithun taught in the classroom and the projects

⁴ Director’s Rules (DRs) are binding rules about land use, construction, housing, and other codes the City of Seattle administers. (City of Seattle 2015)

complemented his teaching. From its earliest days, Mithun experimented to solve design issues way ahead of his time. “He did a bank for example, a small little bank building that had a roof that held water in order to create heat. So the water became kind of a ‘heat sink’ to warm the building. I mean it was just sort of fascinating to me that some of that sort of types of experimentation and innovation has permeated the firm for a while” (Guenther 2013).

Arguably, the break-out project for the firm was the design for the REI’s corporate headquarters and flagship store in Seattle (1993-1996). Among other best management practices implemented on this project, “we started thinking about how to [do] natural ventilation and how to do that in a retail project” (Guenther 2013). Fifteen to twenty years ago was when Mithun began to think about evidence in a similar way as they do today; “some common things started to emerge in our projects, that started to put together a picture of how we thought about projects” (Guenther 2013).

Another factor that greatly influenced the development of Mithun’s evidence-based design approach was the emergence and wide-acceptance of LEED. LEED was first unveiled by the USGBC in 2000 and Mithun’s first LEED Gold certification was for IslandWood in 2002. “LEED’s been pretty well-integrated [at Mithun] for five to ten years at least” (Runge 2013). Mithun has contributed to many of LEED’s historical firsts:

- 2000-2003 – Nordheim Court – University of Washington’s first registered LEED® project.
- 2001-2003 – Stephen Epler Hall – first LEED® Silver mixed-use building in Portland
- 2004 – REI Portland flagship store – The first retail store in the U.S. to receive LEED® Gold certification
- 2001-2005 – Yesler Community Center – first LEED® Gold community center in Seattle
- 2003-2006 – Zoomazium – the first LEED® Gold zoo building in the world.
- 2004-2008 – Mosler Lofts – Seattle’s first LEED® Silver certified and 3-star BuiltGreen rated condominium.

Guenther explains, “as [LEED] evolved, it has resulted in us having a much greater understanding of which things are relevant, which things emerge as relevant on projects” (Guenther 2013).

Though LEED has more of an architectural focus, it set the stage for the firm to seek out and achieve other certifications beyond architecture. SITES is the most notable for landscape architecture, having a similar points system as LEED. Just as Mithun was active in developing LEED, they too have taken part in the SITES pilot projects too. “I think [Deb]’s been really instrumental nationally on working on the SITES, then getting it integrated into projects here ...” (Higgins 2013).

INTEGRATION

Design Process

Mithun’s evidence-based design process is not unlike the typical design process illustrated in Figure 2.4. The difference is that it always relates back to sustainability goals drawn from either a rating system or best practices used within the firm. “I think because we’ve really taken [rating systems] to heart and really integrated those on projects, those practices are normal practice” (Guenther 2013).

“Our first step is to take a look at the existing metrics systems that are out there as a means of framing the project – so LEED, SITES, ... Enterprise Green Communities, Salmon Safe. Taking a look at all of those as a framework to work with ... We would use one of those as a starting point” (Runge 2013). The design team will use these rating systems (at least at first) just as a means to set goals for the project. The rating systems are also a great conversation starter with the client to identify what their own goals are. Guenther explains, “I think being able to have something like a Living Building Challenge, where we can describe for a client a vision of where things are [and] could be in the future is also incredibly powerful. So that they have their peers and their counterparts, and everyone sort of has a shared vision of what could be happening – that’s a pretty powerful tool” (Guenther 2013).

Once ideas are bounced around for what direction a rating system and its individual points can give to a project, “we usually start off with more of just iterative design first and typical design process first” (Runge 2013). Runge continues to say that is typical for the design team to first do a certain level of design work, analysis, and client workshops to get an understanding of what the scope of the project is and where it might be going. “Once we understand the client needs, what the community needs, and we understand the site and the conditions; we start doing a little bit of the early preliminary programming and design work” (Runge 2013). If it is not already a goal of the client’s to achieve a certain certification, the team will assess during the schematic design phase whether it is achievable to get a LEED or SITES certification (Runge 2013). “Then

we take a step back and assess where things are at compared to SITES and figure out what are the initial ideas? What of the initial ideas will help us towards the certification or towards those goals?” (Runge 2013).

An example of how Mithun uses existing frameworks, beyond rating systems like LEED and SITES is described below by Runge.

A project we did in Denver, a healthy living community in South Lincoln area near the light rail station down there. That whole project was based more on health metrics in a more holistic sense including environmental, housing, including landscape, including urban design of the site. And we decided in that project to use health as sort of a framework to kind of integrate evidence into the design process. And so in that case, we had a framework that was in existence to help impact assessment which was already a protocol being developed. There was healthy development measurement tools based in San Francisco Department of Public Health and we kind of adapted that to the needs of the project, to the timeline of the project. (Runge 2013)

The design process then becomes very iterative – and it has to be in order to balance the multitude of goals that a Mithun project sets out to achieve. At first they are “just sketching out [alternatives] and doing some rough calculations” (Runge 2013). But then “maybe you have to move a wall and you know ... well those will affect the calculations for this berm that went in for stormwater and now we have to figure out how to get this square footage back ... It’s back and forth, and it goes through the whole process: all the CDs [Construction Documents], and through SD [Schematic Design], through all the way to 100% construction documents. You’re always sort of tweaking it” (Higgins 2013). This process of tweaking the design is constantly influenced by evidence: researching new systems, asking people in the office what success they have had, getting stormwater models updated from a civil consultant, measuring baseline information about a site or community; all of these inform design decisions. (Higgins 2013, Runge 2013). “You don’t necessarily have the answers or even know; you have to do research, you have to have the conversations so you can come back and try to figure out the answers to questions people are asking” (Higgins 2013).

An example of how the design team might work with a consultant in this iterative process is described below by Higgins.

Usually [with] stormwater we work really closely with the civil engineer and so we would ... develop a design, a site design that we think is the beginning of what will work and works for the program and for the client needs ... we get a square footage of what we think we'll need, we'll do grading that we think might work. And we'll pass all of that to the civil engineer to model and review. Their pass is like, "okay it needs to be this much bigger, this much deeper or we can't get inverts." You know, so it's like a back and forth iterative process ... through all phases ... hopefully you can get a lot of things sort of resolved in SD and then develop further in DDs [Design Development] ... you're basically checking it all the way through. (Higgins 2013).

Mithun recognizes a gap in many rating systems that should be incorporated into a true evidence-based design and evaluation process: post-occupancy evaluations (POEs). Due to the firm's reliance on the processes set up by rating systems, design teams often find it difficult to conduct POEs. "Even if a project has been involved, has done some of the SITES, some of the LEED type work, it doesn't necessarily mean it's going to be easy to go back and look at that project and find out all the data that led to getting the certification ... A lot of times that stuff is just not very readily organized and available. So it takes some digging" (Higgins 2013). Finding the data not only makes it difficult, but Mithun often finds themselves wanting to conduct POEs but having no money to do so. "There's very few projects where we have a fee for post-occupancy evaluation ... it's sort of just on the side for us" (Higgins 2013). In that way post-occupancy becomes more about internal lessons learned for the firm.

Post-occupancy evaluations are not the only form of evidence-based design that is threatened to be cut by tight budgets. "We need to find a way to incorporate [EBD] into our projects and make it affordable for us and [the client]" (Runge 2013). This dilemma plagues many firms who strive to incorporate evidence into their design process. Mithun's answer to this is to streamline the process to meet a project's timeline. "I think the first step was really streamlining the process ... that's one of the biggest hurdles we have in using evidence-based design ... you just have a limited amount of time to gather the information, to implement ... There's also sort of a translation period where you have to translate all of this work that is done by the public health officials using public health jargon that makes it understandable to the layperson or to the designer who's using their own jargon" (Runge 2013).

Implementation and Components

Mithun's implementation of their evidence-based design approach and process, as outlined in the previous section, is characterized by components that ensure frequent opportunities for learning and absorbing current and relevant information. These components include: supporting certification efforts by requiring LEED accreditation, office-wide design critiques, guest speakers, an evidence library, and informal communication.

To support the firm's ambitious LEED certification goals, Mithun requires every designer to be LEED accredited within the first six months of employment (Guenther 2013). This is not only because LEED awards points for having a LEED accredited professional on the project but it also trains each designer in the process and requirements which streamlines the design process.

For Mithun, part of making their fast-paced evidence-based design process work is the gathering of knowledge and expertise already at the firm. Office-wide critiques is a design process supporting component that allow teams to bring up issues they are having and get feedback from others who might have valuable lessons learned to share (Guenther 2013). The critiques also set the bar for the expected quality of evidence and the degree to which the design team will utilize that evidence during their EBD process (Guenther 2013).

One of Mithun's most frequent sources of evidence are the multitudes of professional and academic experts that they invite to speak at the firm multiple times a week (Guenther 2013). Having guest speakers as a regular fixture of education at the firm makes this institution an important component supporting the firm's EBD approach. The types of classes and speakers vary, "everything from very specific and technical, it might be a product-based lecturer that comes in but it also might be someone from within the office that may be sharing a conference that they went to ... it really ranges pretty widely" (Guenther 2013). Mithun will also invite professors in to talk about their research. For instance, Lynne Manzo from the University of Washington was in the office in 2012 to talk about her research on affordable housing projects and the post-occupancy studies that she had done with the users. Other examples include daylighting consultants from the [Seattle] Daylighting Lab or wind engineers from RWDI presenting their studies about pedestrian environments and wind impact (Guenther 2013). These classes aim to expose designers to the subjects and findings from current research. The classes are also usually centered around a theme that the office is focused on at the time; "a lot of times it's reinforcing kind of a direction that we're trying to head" (Guenther 2013).

When it comes to the storage and dissemination of information gleaned from any number of their evidence-based design endeavors, Mithun employs both formal and informal means. “We have certain places on our internal website that folks can kind of go to see resources of where it’s been done before” (Guenther 2013). These resources range from project precedents to journal articles, all categorized to be easily found by keywords. “Our IT group is really good about making it easy to access that information and they just keep it well-organized and keep reminding people that this is an important place to share the information. [We] kind of need that reminder and that sort of enthusiasm from that group to focus how we’re sharing that information” (Guenther 2013). The internal library is also a place where teams can show off their own work; “I think there’s a kind of a personal pride, [a] team pride thing that teams like to be able to share what they’ve accomplished on projects” (Guenther 2013). This concept goes back to the office-wide critiques where the bar for project excellence and innovation in evidence-based design is set high amongst peers.

The knowledge sharing efforts also reach beyond the firm to the public Mithun website where the first tab on the site – even before information about projects, about the firm, and contact information – is a tab titled “knowledge”. This tab reportedly holds “white papers, presentations, case studies, and speaking events [but not always full recordings] that reveal the inspiration, research, and theory behind Mithun’s work” (Mithun 2014). An example of a piece from the “knowledge” tab is an article written by Runge in 2014 titled: “The Evolution of Performance Metrics in Practice” which was also featured on the Landscape Urbanism website (Runge 2014).

Besides the posting of precedents and articles on the internal site, Runge and Higgins agree that most communication happens informally through emails or casual conversation. “I think we all have informal discussions among our team ... you’re bringing those lessons to your architecture team and then to your break-out team” (Higgins 2013). Discussion also typically runs in smaller circles in the office: “[Sandy, one of the leaders of our team] will send out emails about how she’s tracking maybe soil specs and things like that. Or she’ll send out stuff about continuing education, seminars, or webinars where we try to keep up on the latest [trends] ... There’s an article about bioretention mix, soil mixes and whether or not they were being successful in some raingardens in different parts of the Puget Sound area. So we’ll send that kind of stuff out to our team” (Runge 2013).

Each of these components discussed above supports the implementation of the evidence-based design approach by exposing as many of the firm's designers to a multitude of information and evidence that influences design decisions. These range from strict LEED accreditation requirements to informal sharing of knowledge.

Firm Organization

When it comes to Mithun's organization, whether firm-wide or within teams, the philosophy is first and foremost to never create silos within the firm and to evenly distribute knowledge and expertise. "We've taken the approach that we didn't want to [create any new departments or positions] because we're so anti-silo" (Guenther 2013). It is the firm's philosophy that everyone should have an equal commitment and expertise (although in different subjects) to evidence, research, and EBD across the office. Mithun has therefore refrained from deferring these tasks to any one department or person. Guenther points out, "I think what happens in the meantime is that there are people who excel at it and that they become resources but it's more informal, it's not designated ... there's no silo there. It's an expectation that everyone should have [that responsibility]" (Guenther 2013).

This anti-silo philosophy extends to the way teams are organized. The firm used to be organized by type of work – private, public, and non-profit – but it has evolved to include a lot more crossover. "In terms of evidence-based design, I think it means that there are some things that are kind of consistent across all of those that are applicable to all projects and then some things that are more specific" (Guenther 2013).

Another aspect that creates both opportunities and challenges amongst design teams is that Mithun is a multi-disciplinary firm – employing architects, interior designers, landscape architects, urban designers, and planners. "[Having integrated teams] does become very challenging and tricky because you're basically coordinating between like five or six other disciplines to make something work ... It takes a lot of coordination, absolutely" (Runge 2013). The advantage to having integrated teams also means that the landscape architects are both sharing information within their landscape team but, as they move between multi-disciplinary teams, they share information with different audiences each time (Higgins 2013). Expertise and lessons learned from previous projects are thus shared on as wide a stage as possible.

Mithun's decisions about team structure and cross-team organization are not a direct effect of adopting an evidence-based design approach; rather the decisions are an integral part of the design culture for which Mithun strives. Decisions

about team organization do, however, positively affect their evidence-based design approach in that the organization allows the sharing and critique of knowledge more freely across teams.

In congruence with the anti-silo philosophy, individual roles lending themselves to efficient and coordinated evidence-based design efforts are not formally defined. Instead, existing project team roles take on additional responsibilities. For instance, the principal or partner, acting as the project director, is responsible for ensuring that the team is using the best available evidence and that they are committed to asking the right questions (Guenther 2013). “The goal is also to make sure that things we’ve discovered on other projects in the office are applied ... that there’s communication going on within the office so we’re not reinventing the wheel every time, that we’re actually referring projects to each other” (Guenther 2013).

The lack of formal roles or departments dedicated to any aspect of evidence-based design is purposefully designed at Mithun to create an expectation that everyone equally shares the responsibility of being their own expert and that everyone is responsible for bringing evidence to a project. “It’s sort of our philosophy [and] we’ve taken the approach that we want that to be everybody’s commitment and expertise ... it’s an expectation that everyone should have” (Guenther 2013).

However, informal roles do emerge. An informal role that a team member might take on is that of an analytical champion. Someone who has a particular mindset and strength in doing analysis may inevitably become a resource to a variety of teams, though they may not be formally identified as such (Guenther 2013). “Every team might not have that sort of mindset to work through the analytical side of what evidence-based design is ... It’s kind of similar to having your technical guru on a project; you’ve got your analytical guru that kind of rotates around” (Guenther 2013). These analytical people also grow in number as they gain experience alongside another analytical champion and then share that expertise in another project team.

Design Culture

The design culture at Mithun is very much a culture cultivated by its founder and it continues to be that way today. How that culture is expressed and materializes continues to grow and evolve, however. The design culture at Mithun that supports their evidence-based design approach is one of inherent curiosity, entrepreneurship, shared motivation, accreditation, and a regional professional atmosphere that

encourages collaboration. To Mithun, it takes these traits to fuel the EBD culture but they are all necessary because compiling metrics and quantifying information takes a lot of work (Runge 2013). One way the firm optimizes this process is to require every designer to be LEED certified.

Higgins admits that the design disciplines are naturally curious but there are “a lot of curious people at [the] firm”, says Guenther, who “automatically kind of search that information out because they want to know more” (Guenther 2013). For instance, even if a client has no interest in certifications, the team still tries to understand those same parameters within the context of the project. They can apply LEED principles without actually getting the project LEED certified. The firm reciprocates the self-motivation by giving staff the opportunities (and really expecting them) to search out information based on their own curiosity and entrepreneurship (Guenther 2013). Mithun explains the root of this culture on their website stating, “our entrepreneurial culture of sharing and learning from many points of view comes from our founder, Omer Mithun, who never heard an idea he wouldn’t discuss. Today, as he did then, we engage in numerous disciplines to advance knowledge and creativity” (Mithun 2014). This attitude drives the evidence-based design agenda because every evidence search or research starts with a question – a question born from curiosity.

Guenther says the drive and curiosity is in their DNA and they are always looking (or pushing) for projects to apply these processes. Runge describes the pressure Guenther sometimes has to exercise to make sure best practices are understood and are being utilized: “she’ll push it to the point where some other people on the team might be a little uncomfortable ... that’s her approach is to really kind of see how far she can get with it ... Aim high and push a little bit farther than maybe everyone feels comfortable with” (Runge 2013). As something to work towards, Guenther says “where we’ve seen the greatest value of that evidence-based design process come out is when everyone is sharing that kind of attitude” (Guenther 2013). The benefit is that the outcome of an EBD process is new knowledge or the need for new knowledge that “pushes [designers] to think further and go further in terms of both technical and design arenas” (Guenther 2013).

Higgins suggests that design firms in the Pacific Northwest generally share similar cultures based on increasing regional expectations to prove performance on items such as energy efficiency and stormwater mitigation. “It’s sort of standard practice in this region for landscape architects that are working on these kinds of

public buildings to use the metrics or understand the metrics ... you're educating yourself continually to balance those metrics with the goals" (Higgins 2013). This "in the same boat" attitude also garners collaboration between offices. Higgins says, "we're very generous amongst our peers ... they're competition obviously, but we're also all trying to do better work" (Higgins 2013).

The sentiment to "do better work" permeates into the day-to-day operations of the office and staff's own homes. For instance, the firm will reimburse staff who energy-retrofit their home by matching public grants. Other initiatives include bike commuting, battery recycling, and matching green power bills. The firm is able to experience some of these sustainability initiatives from the client/user's perspective and can thus advise by experience – evidence by experience. It is the "practice what you preach" approach (Guenther 2013).

The physical layout of the Seattle office supports communication, collaboration, and innovation. The main studio occupies an expansive, open, pitched-roof space in a re-purposed warehouse on one of Seattle's famed piers. The open floor plan encourages team work and sharing. Instead of siloed into disciplines, designers sit based on project teams. Guenther states that it helps to "share a lot more information and hear from the project teams more often" (Guenther 2013). A model shop central to the studio has become the touch-down space for impromptu crits and invites passersby to partake in the conversation. Integrated technology throughout the office allows ease of communication across offices in real time by drawing on screens and discussing together (Guenther 2013). Mithun is even talking about and experimenting with getting rid of desks and having more lounge-type spaces where people can take their laptops and work privately or have informal meetings among couches around a big screen (Guenther 2013). Guenther anticipates a lot of the office converting to this model in the future.

APPLICATION

Clients and Client Relations

Mithun sees a wide range of clients from those interested in their evidence-based design approach, to those who are more reluctant and worried about what impacts EBD will have on their budget. "I think that the clients that generally are attracted to us, I guess for the evidence-based design, are looking to not only help be accountable and to really do their own walk and talk ... they have a reason why they want to demonstrate their commitments" (Guenther 2013). The clients who are typically the most active in the process and the most ready to embrace it

are those that have their own business values on the line. “There are folks that are often with organizations that want to go through some kind of transformation. And a lot of times we’re able to help them kind of transform their business or their project or their institution or their mission or reflect their mission. Because we can help them use evidence-base design to demonstrate whatever it is their goal is and sort of have a real transformation occur” (Guenther 2013). In this case the organization’s mission is consistent with Mithun’s mission and both teams have a lot at stake to achieve the highest of goals.

Many of the clients Mithun sees poised for evidence-based design, already come with the goal to achieve LEED or SITES certification. “Sometimes it’s true, whatever that certification is that they want, whether it’s LEED or SITES or any of the other green building things, that’ll come from a client because it’ll be a marketing opportunity. How they’re going to market their project, how they’re going to fund it” (Higgins 2013). LEED has been well established at the firm for five to ten years but it is the hope that clients will be looking just as readily to achieve SITES certification.

A lot of clients do LEED for the promotional aspect; it’s part of their own marketing strategy. Some clients take on the perspective of: “let’s just do the right thing and whatever’s most efficient,’ and they’re less concerned about promoting themselves as sustainable or anything like that. So they have a different outlook ... It means that they’re kind of weighing the efficiencies and economics of it and the practicalities of it a little more heavily. But they’re overall open to it, which is great” (Runge 2013). This type of client is great for a project team that wants to move beyond the standard LEED points and explore other areas of sustainability that do not earn points. It can also be a challenge because the client is not necessarily committed to achieving all goals set for the project and so the team might have to steer the client along (Runge 2013). “You have to work with the client to help them along. Even if they’re really sophisticated and very engaged [and] this is there total goal, it can be really hard to keep everybody involved because the processes are so long” (Higgins 2013).

Most challenging to a project team is a client who is reluctant about the use of their EBD process, the added up-front cost of the process, or findings and design directives from the research itself. “Sometimes that happens [clients who are reluctant to pay for the extra time and research], just because folks are trying to deliver a project as efficiently as possible. But I’m always amazed ... when the folks

are familiar with the process and can make it happen, some areas aren't going to cost the client any more – you can really achieve a lot” (Guenther 2013). Clients who are not familiar with the process or the true value of some implementations can be educated by the project team. “We’re always looking at sort of cutting edge things and so they may be better, smaller, quieter than what people have read about. So people inherently have a human nature to be reluctant to do something that’s different than ... if they’ve heard a negative thing and they don’t know anything else” (Higgins 2013). Education about the benefits (short and long term) of evidence-based design solutions and especially the return on investment can really help to get a client on-board.

Guenther describes one project, a Goodwill in Seattle, where the client – a mission-based client – obviously did not have a lot of funds for their project but it ended up being one of Mithun's highest performing projects. This proves that performance does not always directly relate to higher cost. In the Goodwill case, it was the project team who targeted and achieved such high performance goals simply because that is the way they work (Guenther 2013).

An example of where a Mithun project team had to guide a client through the process and push the client's level of comfortability in order to achieve SITES's strict performance is a project in Dallas that had stormwater and greenroof components. The Dallas client was not familiar with stormwater management best practices like Mithun's Seattle clients are. Needless to say, the Dallas client was not comfortable being the first to experiment with and test a greenroof in Dallas since so many other greenroofs in the area were not doing well. The client was just not willing to be the first adopter of that practice in that area (Runge 2013).

On the other end of the spectrum, below are two examples of clients who wanted to be pioneers by building something no one else had done before.

Client Relations Project Example 1: The Chatham University project: “We’ve tried to get from black water to potable water, we couldn’t do it in the state, or they wouldn’t let us. They were going to force us to do chemical processes which would basically ... it would nullify all of the work we had done before to do things in a biological process ... The client really wanted to deal with black water on site through constructed wetlands [to reach potable water]. And that just wasn’t possible because the state wouldn’t approve it without us doing the sterilization process that was chemical ... Everything

you've done up to that point was just ... might as well just do it the chemical way. The client specifically asked for that high-level sustainability feature. But the state required the chemical process and [the client] didn't agree with that philosophically. So we just changed the end goal for water. It's still black water, it's all treated on site, but it doesn't get to a potability level ... So we just never could have anticipated that because there'd never been anything done in that state before to that level. So there's things that we think are goals when we start and they're just not possible, but you don't know until you get in to it. There are things that you don't realize are goals when you start and you just assume and they become a really important factor that somebody buys in to" (Higgins 2013).

Client Relations Project Example 2: "[The Eden Hall campus project] wanted to be the first people to do constructed wetlands, to deal with all the lime coral in the region. And that was one of their goals. So like that's the opposite end of it ... you can never make assumptions, you have to ask questions and try to help advocate for the landscape and push some concepts along" (Higgins 2013).

An example of Mithun bringing an evidence-based framework to a project and the client really embracing it in their own brand is the Mariposa Healthy Living Initiative. During the master planning phase, the client, The Denver Housing Authority (DHA), was looking for a way to frame the master planning process and to create a community centered project informed through evidence. The design team pieced together a number of health assessment frameworks from California to inform the master planning. "It really kind of revolutionized how they thought about their projects ... they've *really* integrated it into their institution" (Runge 2013). DHA has continued to use health as an umbrella for their development projects and have even continued to measure the health of the communities that they are charged with working with (Runge 2013).

Types of Projects

The types of projects that benefit most from Mithun's evidence-based design approach are ones that are inherently complex or that come with a high expectation for performance; which are usually, but not always, certification-drive. In the last fifteen years, Mithun has made a strong shift toward unique, complex, and performance-based projects; so much so that clients are starting to seek them out specifically for these types of projects (Guenther 2013). Since this shift, there is a certain baseline expectation for each project that comes in the door and Higgins

expresses how fortunate this is for the design teams because they can expect at least some sustainable features to be evidence-driven (Higgins 2013). These complex, performance-driven projects – something Higgins refers to as “deep green projects” because of their dominant environmental sustainability aspects – tend to take a lot of time and energy on both the design team and client’s parts (Higgins 2013). Projects that make this time and energy-intensive process even more difficult are the developer-driven projects which often require faster-paced design processes despite similar sustainability expectations (Runge 2013).

One project type that makes projects more complex – and therefore a more carefully documented evidence-based approach is required – are urban projects where limited site area often dictates that one sustainable feature alone cannot achieve expected performance. Runge describes, for instance, that there have been a number of urban cases where the design team has had to strike a balance between landscape implementations (rain gardens) and building elements (cisterns on structure) to achieve stormwater goals (Runge 2013). The complexity of measuring multiple systems to ensure end-goal performance is common to Mithun EBD projects.

Another way to describe a type of project complexity at Mithun is *multidisciplinary integration*. As described above, it takes the landscape architects as well as the architects in the office to contribute to those stormwater performance measures. Higgins, using “green” to describe environmental performance again, says: “the greener the projects get, the more integrated it is. And so that makes it even harder to put it all together. You have to sort of understand that that's part of the process” (Higgins 2013). As a multidisciplinary firm, “the majority of the landscape projects [at Mithun] are integrated projects, so it's never just a landscape project” that will contribute to the overall performance achievement (Runge 2013).

An example of how the “greener” a project is, the more detailed the team has to be is a project done for Chatham University at their Eden Hall campus outside of Pittsburgh. Partially due to it being Rachel Carson’s Alma Mater, there was already a strong environmental commitment at the university and the president wanted to take it further. The Food Studies program in the school of sustainability was part of the new Eden Hall campus. It was their goal to be net-zero or at least [have] a plan in place to be net-zero. Part of this concept included on-site water treatment facilities so that all of the sewage produced on-site would be biologically treated and distributed as nutrient-rich effluent for the soils. “There [are] some amazing things that they wanted to achieve. But we had to do the calculations and ... we

turned to evidence-based design in order to make those decisions ... In order to get those more broad goals, we had to use evidence-based design to kind of make all of the smaller decisions along the way to get there" (Guenther 2013).

Mithun's projects have historically been regionally specific. This is important because the Pacific Northwest has developed unique codes, certifications, and expectations as baselines for performance. Therefore, Mithun's regional projects are often driven by regional values put on stormwater, wildlife, and energy (Runge 2013). Fifteen years ago, maybe ten to twenty percent of the firm's work was outside of the Pacific Northwest; now it accounts for about seventy-five percent (Guenther 2013). Due to the ingrained performance expectation set by the trending Pacific Northwest work, Mithun automatically takes that same standard to their expanding national work. Each time Mithun steps foot in another state, there is a learning curve with the client, local consultants, and regulatory agencies to understand many of these sustainability concepts already widely expected in the Pacific Northwest (Higgins 2013). Runge says, "we're kind of in this more educational role a lot of the time [on national projects]" (Runge 2013).

As Mithun has expanded to other regions, their replicable approach has had to change. Runge explains, "we might have evidence from other projects, but every site is so different ... What might work in a typical condition in Seattle, and then you go to a [different] site ... and all of a sudden you really have to use a totally different ... a completely different system" (Runge 2013). Different regions do not necessarily change the evidence-based design approach or process but it *does* change the application. Mithun has had to reassess their baseline expectations based on different regions due to differing climate for instance.

The types of projects that Mithun's EBD approach lends itself best too are complex, certification and performance-driven, multidisciplinary, and regionally-specific while expanding into national work under appropriately refined benchmark assessments.

Consultants and Consultant Relations

The consultant relationship that results from Mithun's evidence-based design approach is one of collaborating with like-minded people, of educating new consultants, and of broadening the range of consultants while bringing in more acutely focused disciplines.

Guenther admits that Mithun inevitably "gravitate[s] toward the consultants that are using more scholarly evidence in *their* work" (Guenther 2013). These

civil engineers, soil scientists, and ecologists, for instance, that are also making evidence-based decisions, bring a significant and much needed level of expertise to the design team. Innovative problem solving is easiest when your teammates have similar high expectations and can contribute to the conversation at similar high levels of expertise. Guenther says, “it’s so important to have the right consultant really be driving that innovation ... we’re always looking for the best alliances” (Guenther 2013).

Mithun is fortunate to often have access to these EBD-minded consultants, especially in the Pacific Northwest. However, as mentioned in the Project Types section, evidence-based best practices typical in Seattle are often atypical in other parts of the country where consultants of this caliber are not as common. Mithun has therefore taken on the role of educator within the consultant team in some cases. For instance, Higgins says, “we have lots of projects in Nashville where we’re sort of educating the engineers, and the townships, and the state about what has been done in other states” (Higgins 2013). It is not to say that Mithun espouses other areas of expertise but rather guides consultants through the evidence-based design *process* and gives the push where it is needed (Guenther 2013). This is true of contractors as well; Mithun’s design teams align their expectations with contractors’ *beyond* CDs in order to implement a successful vision. Mithun design teams will often “have specific meetings and develop specific drawings and diagrams to educate [consultants] on [evidence-supported] practices that [they] typically use” (Runge 2013). Mithun will even go as far as to bring in a consultant of the same discipline to advise and mentor consultants who have not been through an EBD process. Evidence-based design is inherently a constant stream of learning and taking in information and Higgins admits that other team members are not always comfortable because they might have never seen an application done before but that is what truly drives innovation (Higgins 2013). The same is true for consultants educating Mithun team members – it is a two-way street – particularly where local consultants are experts on local conditions and local precedents (Runge 2013).

Runge in particular expresses the added investment that educating consultants has for the firm. It can affect a consultant’s fee to take the time to learn new processes. There is a lot more hand-holding and back-and-forth with consultants who are new to the EBD process. “It can be really frustrating, but at the same time, by doing it once they’ve done it and then it’s much more easy for them to do it again in the future” (Runge 2013). This makes investing in education opportunities during the design process beneficial to the team at large.

Mithun's EBD approach is also seeing an increasing range of consultants and more acute expertise. Guenther says that when the budget allows, they are employing a greater range of consultants and with that, able to pull in more specific expertise (Guenther 2013). On a Denver House Authority project, for example, the design team received funding to bring on public health experts to the consultant team (Runge 2013). "Other projects like the national parks, they have built-in resource scientists who can give us all the data and information and that then helps inform our design decisions" (Runge 2013).

The success of an evidence-based design approach at Mithun is largely dependent on their integrated design team made up of consultants that are well-adapted to research and evidence, consultants that need to be brought up to speed on expectations and processes, and consultants with a vast range of knowledge in niche fields. This allows the Mithun design team to effectively base decisions on credible evidence and benchmark *alongside* consultants early in the design process.

Marketing

The evidence-based design approach at Mithun has affected how the firm markets itself in that EBD has become a successful marketable piece of its own. Through the years of certification-based and EBD work, the firm has become known for this experience and clients are specifically seeking the firm out for it. Guenther says, "when [potential clients] do their nation-wide search, our name generally pops up ... we're more of a resource nationally for folks that want to do this kind of work" (Guenther 2013). Clients are attracted to the firm for their evidence-based design because they are often looking for accountability and performance.

Marketability as an EBD practicing firm did not come immediately for Mithun. It started in the birth and growth of LEED. As clients sought out LEED, they sought out LEED-focused firms like Mithun. As Mithun has expanded into other certifications and performance-based work in general, their reputation has grown. Higgins says now that, "we're hired specifically from a national pool for the work that has been done in this office before" (Higgins 2013). As regions around the country are catching up to the Pacific Northwest as far as BMPs, Mithun is able to take that already-established expertise and apply it elsewhere.

Although Mithun is not known for producing original research, their lessons learned, findings, and innovative solutions resulting from their EBD process can also be turned around and fed through a feedback loop of marketable material (Higgins 2013).

PROPAGATION

Reporting

Mithun's culture of reporting tends to be on the casual, informal side rather than by journal and peer-reviewed means. Guenther does, however, speak at conferences for a range of topics. She also says that a lot of their EBD findings end up being shared through Mithun's partnership with various organizations. Other information finds its way to the public through various social media and web postings. At this point, certifications like LEED and SITES do not share project documentation publicly; so although it is a form of *reporting* information, it is not the best form of *sharing* information publicly with the field to increase the knowledge base.

Guenther, who regularly speaks at conferences, prefers this form of knowledge sharing because it is more colloquial and generates conversation. She says, "it's great to be able to talk more directly to people and that usually generates folks that are particularly interested in the topic [to then] have the chance to talk more one-on-one with people" (Guenther 2013). Speaking engagements are also a better way to handle proprietary information or possibly design implementations that did not result in the expected performance. Guenther says that when sharing information in an oral presentation format, "[she is] a lot more comfortable saying, '[they] tried this, this didn't work' because that feels more like a conversation, not something that somehow is more set in stone like a case study, which can be misinterpreted ... The ability to interpret that is lost when it's in printed word versus being able to talk about it where people have context for what *kind* of mistake it was" (Guenther 2013). She says that when a positive conversation can come from sharing mistakes and lessons learned, the firm is pretty willing to share (Guenther 2013).

Information sharing is also done through Mithun's collaborations with many community and professional organizations like the Landscape Architecture Foundation (LAF), the Urban Land Institute (ULI), the U.S. Green Building Council (USGBC), the International Living Future Institute, and the American Planning Association (APA). Their work with the LAF's Landscape Performance Series (LPS) is closely related to the EBD approach considering Mithun has developed case study briefs (with academic teams) for the Taylor 28 project in Seattle which documented four measurable environmental performance benefits, and the Zoomazium at Woodland Park Zoo in Seattle which documented two environmental and one social performance benefits. Higgins is also working on a case study brief for Eden Hall at Chatham University. Guenther has also contributed to the larger discussion within LAF's LPS by participating as a panelist to discuss why landscape performance is important, projects that

illustrate landscape performance, and challenges with landscape performance. Guenther feels that “the information [Mithun has] on projects is valuable to share” (Guenther 2013).

Other forms of more casual reporting are often used at Mithun. General attendance at conferences helps information permeate to the larger profession while allowing attendees to gather information and bring it back to the office to share (Guenther 2013; Higgins 2013). Mithun sees a large amount of detailed content posted to their website through the “News and Ideas” page which is open to the public to access. Guenther candidly adds that “we’re much more focused on social media and twitter [now more than before] and kind of try[ing] to share information through that as well. I don’t know how often we get into the evidence-based design component in forty characters or less. But it’s attracting people to something, a report recently published or something” (Guenther 2013). She says they use it more as a quick-glance filter and gateway to more in-depth articles, blog posts, and relevant research studies.

Collaboration and Outreach

Mithun’s relationship with academic institutions, public works, and industry organizations will sometimes aid in their efforts to measure performance. Guenther points out that this is not projected design performance, but rather monitoring *actual* performance which she says is hard to find people to pay for. “It is very hard, but that’s the most important thing we can do. Because even if we say that we’re going to design it to [a performing standard], and we don’t really know how it’s performing, then it’s not really that useful” (Guenther 2013). Runge points out that both he and Guenther have had the discussion with relation to case studies about how to better work with academics and students in a way that can be more beneficial to both the firm and the body of research. In grappling with this topic, Runge notes:

The challenge is that both the time frame we’re working under is a compressed development time frame and we don’t have time to do a true academic, scientific research project on *any* project we have ... Part of me is acknowledging that as designers, we can’t be scientists. We have to understand how to figure out ways to partner with scientists, with researchers in a way that can provide more information. It’ll enable us to do our work better. We’re still trying to figure that out; that’s a big challenge. (Runge 2013)

One example of collaboration is when Mithun works directly with universities to do performance monitoring. Academic courses benefit from these partnerships

because they can work on real-world applications within the required curriculum. Professors like it because it might meet one of their research goals to do a real-work study. An example of this is the Epler Hall project at Portland State University where an architecture graduate student (who had a science and analytics background) went through the research analysis on energy and water of that student housing building (Guenther 2013).

Having a lot of university work throughout the office, it is natural that Mithun has a very close relationship with universities. In addition to the firm partnering with these academics to measure performance, they will often have professors as guests lecturers and vice versa. Mithun designers will go to speak to or teach classes and professors will come into the office for various events or lessons (Guenther 2013). A few of the more recent professors hosted at the office include:

- Lynne Manzo – University of Washington – Post occupancy study of affordable housing project
- Stephen Luoni – University of Arkansas – Full-day workshop on building recombinant ecologies
- Raymond Cole – University of British Columbia – Building An Environmental Ethic: public awareness of climate change and environmental degradation set amidst a host of other pressing concerns, like national security, volatile energy prices and over-taxed infrastructures.
- John Marzluff – University of Washington – His current research on how the pattern of human settlement affects the structure and function of bird communities along the urban-rural gradient.
- Kine Halvorsen Thorén – Norwegian University of Life Sciences – Her research on green infrastructure, planning, and densification.
- Glenn Acomb – University of Florida – His research, with the discussion ranging from growth management and water conservation strategies, to resource efficient site design and landscape management practices.

Another area where Mithun has had some collaborative success over the years is giving utility companies access to their installations to monitor performance. Guenther says a few years ago, the public utility in Seattle hired a data consultant to monitor performance on one of Mithun's vegetated roof designs and their findings actually contributed to the decision to change drainage rates for people that provided vegetated roofs. The performance monitoring was therefore paid for by the utility company but benefited Mithun by providing that data to the firm (Guenther 2013).

As mentioned in the Reporting section, Mithun is involved in many community and professional organizations, two of which are the SITES and LAF. SITES is newer to Mithun and Guenther has been instrumental, nationally, with SITES, as well as trying to get it integrated into projects at the office. LAF's Landscape Performance Series (LPS) is a structured collaboration where an academic team receives a grant to measure and document performance benefits. Guenther says, "it's a really good symbiotic relationship because I think the rigor of their process ... influences our process and the information that we have on projects is valuable to share" (Guenther 2013). Runge and Higgins reflect on the LPS process, arguing that if a project is not already carefully documented, it is hard to go back and gather that information. It is time consuming and not part of every project fee. They admit that it becomes more of a side research project and designers volunteer their time. It therefore helps to have academic partnerships to take on some of the brunt of the work (Runge 2013; Higgins 2013). Higgins also argues that it would be nice for the firms to receive funding for the LPS as well because "even if we have a couple of great academic partners that are willing to do as much work as they possibly can, by default we have to coordinate the effort of getting that information together because we were involved in the project ... it *does* seem like both academic researchers and designers need to be funded to develop the case studies" (Higgins 2013). Despite this, Mithun sees a real benefit to having those measured performance benefits, to be able to point out real metrics to educate the client or the team instead of having to rely on unsubstantiated assumptions.

Overall, Mithun is very connected to its regional universities, civic institutions and national professional organizations as a way to make research is practice more practical and affordable. Guenther mentions that practicing in the Pacific Northwest, firms seem to more open to this kind of supportive design and monitoring collaborations. Runge adds that "every situation is different, and every set of partnerships is different to make it happen" (Runge 2013).

Future Trends, Goals, and Fine-Tuning

Mithun's goals for moving forward with their evidence-based design approach include improving their collaboration and frequency of research, becoming better at monetizing performance, and continuing to be thought leaders as new research becomes available or needs to be done. Guenther, Runge, and Higgins also foresee trends occurring in the profession including dealing with topics of resiliency, adaptation, and climate change – all of which Mithun wants to explore as well. The role of EBD in affecting policy change and the future of LEED and SITES are also discussed as they relate to the future of the profession.

As mentioned in the Collaboration and Outreach section, Mithun will occasionally collaborate with academics or organizations to do research and especially to conduct POEs. One of Mithun's goal is to do that work more often and Higgins says it is likely a goal for the field as a whole. There is a frequent discussion about how to tap into resources like students and professors while making it beneficial for them, for the firm, and for the general body of knowledge. Getting the money to do that research is a major question. Higgins says the client either has to be willing to pay for it or the research is funded by other means like grants. Higgins imagines this could even "fund a little research wing within our firm" (Higgins 2013). This, however, brings up the issue suggesting that design researchers in practice need to become more commonplace and not have to feel as though their jobs are always on the line (Runge is aware of this situation at other firms trying to balance the role of their researchers). Any type of collaboration, Runge elaborates, is "some blend of figuring out a way for us to fund more investigation, develop more baseline evidence, to monitor what we've done, and do post-occupancy-type research. But if we can't do it, then we need to figure out a way to partner with people who can to make it happen" (Runge 2013). These opportunities for collaboration enable Mithun to keep a finger in the science without being scientists themselves.

Another goal of Mithun's EBD visionaries is to expand their practice of Triple Bottom Line principles and to start monetizing benefits, seeing as it is a common language between developers, stakeholders, and designers. Runge says the firm should "actually broaden [their] reach and broaden the field and the way to think about things, to bring in social equity, community, and built environment, the landscape, [and] the actual ecological systems under one umbrella" (Runge 2013). There are several calculators available for landscape architects to start putting a monetary value to things like public open space and urban forest. Higgins points out that, "early on in the project, I think it can be really strong for specific clients to have [conversations about economic benefits]" (Higgins 2013).

Overall, Mithun hopes to continue to be thought leaders within their field as the field evolves. Guenther expresses that, "people are catching up to what we're doing because we've been doing it for a long time. We're glad that that's happening. I think what it means for us is that we have to keep pushing ourselves to understand what the next horizon is and to be nimble about providing that thought leadership, because that is our business model" (Guenther 2013). Chasing the next horizon

inevitably comes with some risk of failure and Guenther admits that in order to discover that something new or something innovative, Mithun has to push the limits of experimentation and accept the attitude of being *willing* to fail – within reasonable limits. A few topics Mithun sees coming down the pipeline include: “understanding the role that human behavior plays in response to design and the ability for those designs to perform at a high level” (Guenther 2013) and focusing research on metrics that do not have a lot of existing information yet like noise and air quality issues. Guenther says of these metrics, “we have a lot of projects where we're zeroing in on those as being critical components. And so we're growing our understanding of noise and air quality, *exterior* air quality issues” (Guenther 2013). In addition, health has become a topic of increasing awareness considering the cost of healthcare continues to increase. “Using health as an umbrella for development projects and measuring the health of the communities” is something Mithun has growing interest in investigating (Runge 2013).

Mithun also sees opportunities to grow their own EBD approach as concepts like resiliency and adaptation become more common in combating global issues like urbanization and climate change. “Those questions [about climate change] are coming up too in competition... we're not the only ones who are interested in it and the client's not the only one who's interested in it” (Higgins 2013). Runge recognizes that Mithun already has a leg up on the competition as cities continue to update their codes and practices based on climate change mitigation. This is due to Mithun's past EBD work and their experience with best practices concerning adaptability in the landscape (Runge 2013). One example that continues to permeate their work is the need to adapt to more frequent and dangerous flooding. On a project in Dallas for instance, the minimum flood event required of the team to design to increased just during the design process alone. Clients are beginning to shift their thinking, especially after Hurricane Sandy, because the cost of dealing with disasters after the fact became so obvious. Runge suggests that Mithun is able to speak to this point with clients using the available evidence and evaluating how different strategies can be beneficial (Runge 2013).

Another trend Mithun sees continuing to grown in the profession is the use of EBD and research as a means to affect policy. Guenther sees EBD as a means to highlight codes that need to change so that progressive designers are not all trying to fight the same fight. On-lot wastewater treatment, for instance, is currently a major issue that many firms are trying to combat because of the code restrictions in place leaving clients to set up their own water utility districts. Cities like Seattle

are pretty progressive and Tacoma is catching up but the majority of cities around the country are still several years behind where Mithun is already currently practicing. Another example of climate change research affecting policy is that federal funding for transportation is no longer so heavily leaning on the vehicle and its infrastructure (Higgins 2013). More projects are receiving federal funding for multi-modal transit, light rail transit and integrated bike lanes – all elements often employed in Mithun designs because of the overwhelming evidence that supports community health and reduced atmospheric pollutants.

Lastly, Mithun foresees an evolution in certifications like LEED and SITES within the profession. Guenther describes what an amazing impact LEED has had on the practice and industry as a whole. LEED Silver, which once seemed so far-fetched is now being considered the standard and it will likely continue to move into Gold and Platinum. Guenther says they are hoping to see that kind of change in SITES as well. “[SITES] is at the stage when everyone's going to complain about how difficult it is and who's going to pay for it. But then ten years from now it'll be normal practice” (Guenther 2013). Higgins is already hoping that SITES will have a similar marketability factor that famously grew LEED – where clients are clamoring to hire the firm that has the most experience and specialty in earning points for a plaque and title. “That'll be an impact that we're going to see in the next five years with projects” (Runge 2013).

As a whole, Mithun is strongly looking forward to how their existing evidence-based approach can be improved to address growing issues of our time and how landscape architects, as agents of change, will need to be prepared and armed with evidence to produce best possible solutions.

Sasaki Associates

Office locations: Boston, MA; Shanghai, China

Year of Establishment: 1953

Total Number of Employees*: 256

Number of Landscape Architecture Staff*: 60

Firm Philosophy, Values, Mission: Pursue the unknown, keep everything connected, prove what's possible.

Type of Work / Specialization: Comprehensive and collaborative approaches across disciplines and scales specializing in campus masterplanning and design, regional planning

Firm's Definition of Evidence: Available information that can be used to inform decision making. Given the scale and complexity of designed environments, evidence can include well-accepted principles and heuristics in addition to empirically derived evidence (Goulding 2016).

Firm's Definition of Evidence-Based Design: Design is a synthesis of multiple considerations that must be carefully weighed and prioritized. Some of these are subjective concerns based on experience and imagination, but with better tools and enhanced understanding, designers can increasingly factor in evidence to more reliably achieve the imagined and intended impacts (Goulding 2016).



Figure 4.7 Sasaki Associates Watertown Office (Photo by Elise Fagan)

NATURE + EMERGENCE

EBD Approach

Sasaki Associates' evidence-based design approach utilizes internally developed investigative software to collect, analyze, and visualize large amounts of complex data in order to make real-time design decisions. "It's not just analysis and it's not just design, but it's bringing those two things together" (Janks 2013). With a think-tank of designers and programmers behind the inception and creation of the software, the process of tool utilization to inform design is both project and problem specific. This is due to each software tool being tailored to the type of project requiring the information and therefore to answer a specific question or problem at hand. It is therefore also a *reactive* evidence-based design method in that the tools are most often used in response to issues that arise during the design process. "The tools are almost incidental to the approach. The goal is: how do you craft a strong analysis function to support planning and design decisions?" (Janks 2013). The Suite of Tools including Smart Plan, The Visualizer, My Campus, and the Prioritizer (described further in the Design Process section) can be used to engage the community and allow clients to see information in a way that allows informed and direct decision making. The tools are also utilized as alternative scenario modeling, allowing designers and clients to visualize the effects of variables and decisions instantly. While the software tools were originally designed for specific projects, they are growing to become standard tools for use between similar projects allowing each project to gather similar data and make use of the analysis as each project requires.

Greg Janks⁵, Anthony Fox⁵, Maggie Dolan⁵, and Ken Goulding are all members of the internal Sasaki Strategies group. Coming from different academic backgrounds, this interdisciplinary think-tank takes different approaches to "traditional planning and design problems and then applies technological solutions to solve them" (Hibbard 2013). Greg Janks, who works at Sasaki Associates as a planner but comes from a financial background, facilitates the group. Ken Goulding, one of the software programmers, builds the programs based on the needs of a particular project. Maggie Dolan and Anthony Fox are integral members of the Strategies group that brainstorm the technological solutions to problems but are also applying the Suite of Tools to their own projects and acting as representatives for other teams. Joe Hibbard, while not a member of the relatively young Strategies group, has witnessed how the firm has evolved to develop and accept this evidence-based design approach into its practice. Goulding clarifies that the group has "never been a fully separate entity or anything. It's part of the planning. And I guess it's a way to differentiate ourselves

⁵ As of publication date, Greg Janks, Anthony Fox, and Maggie Dolan are no longer employees at Sasaki.

... to bring that focus to all our projects” (Goulding 2013). Ultimately, the group’s goal “is to make – rather than a static document – a living, breathing, constantly editable, kind of framework for decision making” (Fox 2013).

Being a firm with a specialty in strategic planning, Sasaki’s need for a flexible framework came from the sheer amount of data used to make informed decisions. Fox explains:

Often we work with universities who have tons of data sets on how they’re using energy, how they’re using the classrooms, how hyper or little-used some of their spaces are on campus, what groups use those [spaces], when buildings were built, what their conditions are. But they are often individual data sets and it’s very difficult for universities or cities sometimes to be able to use all those data sets and inform proper decision making at that board or administrative level. And so a lot of the times we’re taking input that’s already out there and synthesizing that so it can be displayed in clear ways to make informed decisions. (Fox 2013)

The Suite of Tools helps to collect, organize, analyze, and visualize this vast amount of data. This process is really about “both understanding how the data can influence the design but then also understanding how data generated by the design process can feed back into that loop so that we can understand the impact of the design” (Goulding 2013). Dolan notes, “what we really hope to do is to make data nimble and usable on different scales” (Dolan 2013). The scalability aspect allows the planning to take place on a large scale but then also be able to drill down to one feature’s role within that, thus allowing the team to ask different questions with the same data (Dolan 2013).

A big part of the Sasaki Strategies Suite of Tools is being able to take “all of the data sources that are out there and being able to clearly visualize that” (Fox 2013). The visualization of complex amounts of information and analysis not only helps to inform the design team but it is a means to inform the client as well. “The power of computing has allowed us to investigate as well as demonstrate to clients information that only could have been done sort of intuitively before ... So in that sense it’s made design more rational, it’s made it more transparent. Like you don’t have to simply trust me to say that, [for instance,] this kind of environment is going to be better for student gathering. I now can *show* you evidence that that is the case” (Hibbard 2013). What the “technology-enable Sasaki Strategies”

group has done is "make that decision-making process more visible so people can participate in it much more easily" (Hibbard 2013).

The efficiency of Sasaki's evidence-based design approach lies in the multi-use aspect of the software; in that it allows the collection, synthesis, analysis, visualization of data, and on-going scenario modeling beyond the life of the project to happen all in a Sasaki-personalized Suite of Tools. The integrated approach brings planners and designers together in a parallel process rather than each party having to react to the findings and decisions of the other. Hibbard clarifies that it is not basic research that the Strategies group is tasked with; it is very specific and targeted to the project and its unique issues (Hibbard 2013). The Suite of Tools ultimately supports the decision-making process, giving the analysis a high level of accuracy and the design a "high level of feasibility" (Goulding 2013).

Finding and Producing Evidence

The benefits of the Sasaki software are contingent on the input of data into the system. Due to the project-specific nature of Sasaki's approach, the type of data used as inputs depends largely on the needs of the project. The firm's specialty in campus planning work often requires data on classroom use, building history and conditions, energy use, fiscal budget, and student demographics. In these examples, the universities often already collect this data and the role of the software is to organize and analyze the data so that different cause and effect scenarios can be identified and extrapolated.

Other programs in the Suite of Tools are tasked with gathering new data. Gathering information on the activity of spaces, paths of travel, perception of safety, and opinions of students are just some of the ways community input specific to a particular university can become a data set to be used in analysis. Fox compares the qualitative vs quantitative aspect of this type of data: "[you] can't really call that hard data. But when you can see the amount of responses we have and when you stack three thousand student responses at the same general location, I think we can stand on that as pretty good evidence about something" (Fox 2013).

In order to design and plan according to these findings, data is extrapolated to spatial extents in the form of maps. Whether they are campus-wide maps or city maps, base information is often collected through GIS databases. The type of data found in any number of these databases are fairly similar but it is up to the project team to filter and overlay different data sets for meaningful analysis. This process

is not unlike the McHargian method of large-scale land analysis (one of the first examples of evidence-based design in the landscape architecture profession). The McHargian model involved overlaying site inventory data (ie. slope aspect, vegetative cover, drainage ways) to assess areas of suitable land use, thus informing human development and resource conservation.

Development and Evolution

Sasaki Associates has a long history of evidence-based design practice involving analysis methods familiar to the profession as well as conducting their own in-house research when few firms had the resources to do so. This inherent value placed on evidence-based design made way for opportune utilization of technology to aid in data collection and analysis as well as bring disciplines together in a parallel design process.

The history of Sasaki Associates' technologically-driven evidence-based design practice dates back about a decade (the early 2000s) (Fox 2013). Fox recalls, "it was five or ten years ago that we were still doing masterplans as a static document. We'd do space projections, renovation requirements at the time ... and we'd draw boxes and rectangles, grow(ing) this way, new buildings here, or new street alignment here. But you know, we often just kept finding that a few years out, those findings are out of date – they're not relevant anymore" (Fox 2013). The task that the firm faced and what the Sasaki Strategies group was formed to do was to bring the elements of scalability and flexibility into their planning process. The ultimate question was: "how do you take it away from something that's sort of static and frozen and unable to adapt to changing circumstances and turn it into more of this sort of ongoing process that's able to nimbly adjust as new opportunities emerge? How do you try to measure things that can be measured and how do you try to incorporate the things that can't be measured within an analytic framework?" (Janks 2013). The firm then "came up with the Strategies group as a way to bring that focus to all [of their] projects" (Goulding 2013).

Sasaki's technological EBD approach was not viewed as a drastically different design process that the firm needed to adopt, but rather an aid to the process the firm was already accustomed to. Hibbard remembers that "Hideo (the founding partner) was a pragmatist when it came to the practice of landscape architecture ... If a piece of information or a methodology was available and made sense, he would be the first one to jump and employ it. If it were theoretical and if it were on the border and we weren't quite sure how we were going to use it or not, we would just say, 'forget about that!' He was looking to solve problems" (Hibbard 2013). This is

where an understanding that the technological tools are incidental to the approach comes from. The tools are used to make the process more efficient and dynamic.

Prior to the software innovations, Sasaki Associates collected and applied information similar to the way they do today but by hand. One example of this was the McHargian method. Hibbard notes that the one thing that influenced and evolved the McHargian-like approach (for the firm as well as the profession as a whole) was the introduction of technology. “[The McHargian methodology] was all done by hand, laboriously tracing aerial photographs. And now you can do the same thing just going to online resources in probably a tenth or less of the time it used to take back then to do the same thing” (Hibbard 2013). Another by-hand method that inspired one of the Strategies group’s software tools is “the old boards where you put something up on the wall and you give everybody a sticker and they respond to it. We’re finding all sorts of ways of using it” (Goulding 2013). The Strategies group digitized this concept into the “My Campus” tool, making it easier to gather larger amounts of information and analyze it quickly as well as visually. “Before we had the tool My Campus, we sort of relied on more anecdotal methods for gathering information. But now that we have My Campus ... you can gather huge amounts of information ... You can get the data faster ... But it’s allowed you to sort through the stuff and it’s also created more stuff than you used to have to deal with” (Hibbard 2013). Having seen twenty-four years of change at the firm, Hibbard recalls that “things [in the design process] didn’t move at the pace they do today. But the process is fundamentally the same” (Hibbard 2013).

What required change to the firm’s design process was the way in which the planners and designers collaborated. It used to be that “the planners would be figuring out all the numbers and the designers would just be focusing on design” (Goulding 2013). One of the first goals tasked to the Strategies group was to bring planners and designers together in a parallel process to avoid a linear situation where the planning is done first and then the designers receive the plan and cannot shift things around. Then, only when the design is done, the team starts to realize the impacts of the design. Goulding describes the emergence of the “Smart Plan” technology as it addresses this design process obstacle: “we came up with [Smart Plan] because we recognized there was kind of a parallel process that was happening between people who are identified as planners and people who are identified as designers ... And you know, there was some communication between those two worlds but it wasn’t until near the end of the process they would really come together and try and flesh it out, figure out what the impacts would be

of that design” (Goulding 2013). Smart Plan allows both parties to participate simultaneously while visualizing and quantifying how one group’s decisions impacts the other’s. “What we wanted to do was be able to, from very early on in the process, figure out what is important in terms of tracking the numbers on any project, the numbers that will be coming out of the design” (Goulding 2013).

INTEGRATION

Design Process

The relatively young technological innovations at Sasaki Associates act as an aid to the firm’s already analytically-heavy design process. The design process itself has not changed but the amount of data the teams are able to collect and analyze makes for more informed decision-making with a higher level of accuracy and project specificity. The application of the tools in the design process is also not prescriptive and can vary widely between projects. When an issue arises during a project and the team believes that the information gained from using one of the tools will help them to design and plan more appropriate spaces, then a tool is used. Some of these Sasaki-original tools include My Campus, The Visualizer, Smart Plan, and The Prioritizer. If an appropriate tool does not exist, the Sasaki Strategies team will sometimes create one. Thus the tools are considered to be incidental to the design process – they solve a particular timely need. Goulding describes this reactionary approach:

On project work, things kind of happen as they happen to a large extent. And we kind of like it that way because it allows innovation to happen in interesting ways. If we were to say that in order to use Sasaki Strategies you have to start six months out or something, we’d basically never have come to any of these tools because it’s always kind of the last minute things that somebody comes up with a cool idea on a project and we have to get it done within two weeks (*all laugh*) ... but that works well. That’s where all the most interesting innovations happen. (Goulding 2013)

Along with being reactionary, Sasaki’s design process is also deductive in nature. Approaching design problems from the bottom up, as Janks would describe it, in a sort of fantasy version where clients pick and choose exactly what the outcomes are does not necessarily advance a solution. Rather, Sasaki design teams conduct their process from the reverse way: “within these constraints, how would you like to solve the problem?” Janks explains that they can be a lot more effective with this approach. While the first example has an aspirational quality that they do

not want to lose, "having both perspectives is really important and I think sort of fundamentally changes the design process for the better" (Janks 2013). Within this deductive process, constraints can surface from several sources: data collected from the community, site constraints, but also client expectations. "Sometimes we'll come back after a meeting and the client will give us a direction and we'll input those directions into the models and see what different alternatives we can come back with. And sometimes it'll give us very clear direction on, you know, we need to go this direction – it's the clearest, most rational approach" (Fox 2013).

Approaching design problems with a deductive process can help make a process more efficient by working rationally within constraints, but the Strategies team does not deny that their process is still inherently iterative – especially as the goals evolve (Goulding 2013, Fox 2013). The flexibility of the tools allows the team to quickly assess the impacts of new information or clients' changing goals. "As the designs change, we want to understand what the impacts would be on things [that] the client care about ... And I think its most effective use is when you can get a small group of decision-makers in the room and really use it as a tool to move the discussion forward, to be able to understand exactly what the client wants out of the design in terms of the data that it's generating ... So it makes the design better because it gets more feasible at the end of the day and more tailored to what the client really wants" (Goulding 2013). Again, the process is iterative as it repeatedly collects and uncovers information but it is deductive at the same time because it is rationally analyzing those truths to come to a design conclusion. "Being able to organize and develop a variety of programs, demonstrate them, test them with people along the way, is so much more effective than again, coming up with a plan after which someone says, 'well gee, this isn't really what we wanted, it's not what we need, and it's not going to work'" (Hibbard 2013).

Having a deductive design process also allows Sasaki designers to creatively design based on the data collected and thus tie their vision to the project's factual information – essentially saying that the problems of the project *need* this design. "[Our process] avoids what often happens in this industry which is, you know ... if everyone can't agree on a design, if the design is insufficiently flexible or it doesn't match those targets, what usually happens is that the design gets reworked in such a way that it loses the vision of the designer ... So being able to have these kinds of tools early on in the process really helps with the integrity of the design and being able to make sure that the designer's vision actually goes through" (Goulding 2013). It is design that is truly evidence-based.

When it comes to the actual use of the tools, the process and timeline varies based on the tool. One idea that is common to the conception of the tools is that “we want to be able to, from very early on in the process, figure out what is important in terms of tracking the numbers on any project, the numbers that will be coming out of the design” (Goulding 2013). The commonality is that Sasaki planning and design projects are number heavy and the problem-solving design process comes down to: “how do we make these numbers meaningful?” For instance, “it’s very difficult for universities or cities sometimes to be able to use all those data sets and inform proper decision making, clear decision making at that board or administrative level. And so a lot of the times we’re taking input that’s already out there and synthesizing that so it can be displayed in clear ways to make informed decisions” (Fox 2013). Hibbard also describes that “getting the data is not only a process of just sort of bringing stuff in; it’s a process of bringing it in, looking at it, and either getting rid of it and saying, ‘that’s not relevant, that’s not relevant, these are the pieces that are relevant to this problem’ ... Then you have to ask the question: What does it mean in the context of the problem we’re trying to solve? And is it meaningful at all?” (Hibbard 2013). Each of these complexities and questions that arise in data-heavy design processes can be answered with a Sasaki-developed software tool. Fox summarizes how the tools are conceived, created, and then applied in Sasaki’s EBD process:

So I’ll meet with Ken and I’ll meet with Maggie and I’ll say, “Ken, here’s an idea ... here’s the issues that are being laid out for this particular project. It would be great if we could figure out a way to do something like that, to be able to visualize the community input.” And then we’ll have a dialogue back and forth and as a team we’ll figure out, you know, what are the issues? How do we pull this? And then Ken and a couple of people will get started on creating a tool and go back and forth and we’ll refine the tool. And then we’ll actually use the tool with our clients, with the community that’s part of the project. And it’ll inform things in the front end and then as our design evolves we’ll sort of feed it back into the tool often and it’ll sort of keep recirculating and refining design intentions. (Fox 2013)

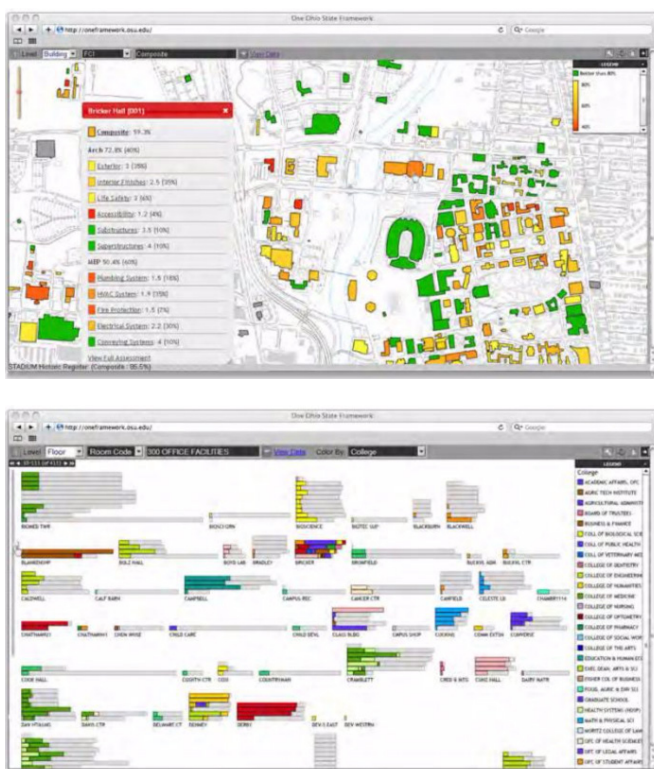
One of the first tools developed by the Strategies group is the My Campus tool. It is primarily a data collection and data visualization tool. It allows the team to survey a large population and map the resulting information spatially to identify patterns. It was first conceived on a campus planning project but it is now used to collect qualitative responses from any population to inform space planning.

“Overall I would say it’s a phenomenal tool early on in a process to either confirm or deny our own intuition or our own understanding of what’s happening. Or discover new things that are issues or opportunities” (Fox 2013). The tool’s design varies and depends on the questions being asked but it is more than just a web-based survey. Often, the My Campus tool is presented to participants on a tablet where they can draw on maps, apply different attributes, select ratings, and then also give a written response. This gives participants an active voice in the process while making data collection more engaging, thus the name “*My Campus*”. Layer these responses and the team can then identify patterns like paths of travel, frequency of use, perception of safety, and preference for activities. The data can also be presented visually to clients as a way to leverage decision making with evidence from their own community.

My Campus can be used for general information gathering at the onset of projects but it is more often likely that the team is posed with a specific question that requires the input of the community. Examples of how My Campus has been applied to real projects are described in Appendix B by Goulding and Fox, for the University of Akron (pg 276), by Dolan, for university dormitories (pg 277), and by Goulding, for Brown University (pg 277). These demonstrate the specificity to which the tool is used to seek direct answers to a particular question at any point during the design process. My Campus has also been used as a post-occupancy evaluation tool. For instance, Goulding describes a situation where “we put up a great new sports center and we want to know three years down the line how students are using it, whether it’s working for them the way that we [expected] ... It really helps us, I guess grow as a firm to learn from our past work. So that’s one way we’re using it” (Goulding 2013).

The Visualizer, as the name suggests, is a tool that allows for the organization, filtration, and visualization of large amounts of data. This tool is most useful on campus and city planning projects where the client (typically universities or municipalities) already collect and store most of the necessary data but are unable to synthesize and analyze it in a meaningful way. “The Visualizer is really about understanding what you have and it can help you figure out what you need to do” (Goulding 2013). Figure 4.8 shows an example of the The Visualizer in action on the Ohio State University project. As part of the design process, the software allows the team to filter data based on certain parameters in a process to discover (often intangible) relationships and patterns. “It’s kind of like when you’re doing online shopping and you’re trying to find the right

Figure 4.8
The Visualizer (Sasaki Associates 2013)



buy. So whatever it is, you can set these different ranges and create that database and it'll show you just things that match those criteria" (Goulding 2013). A common application for this tool is to inventory and analyze the utilization of space on a campus in order to identify areas in need of growth or opportunities to condense; all of which can inform a campus plan. "[The Visualizer] may show you opportunities to better use existing space. So on the research expenditures piece, a lot of investigators will retain their lab space even if they're not receiving grant funding. So to give the university a tool to say: these people have money to spend and no place to go. And to consolidate people who aren't being as efficient with their resources" (Dolan 2013). The visualization aspect is not only useful to the planning team

but also as a tool to show clients where and how decisions are being made; decisions that can affect their bottom line. An example of The Visualizer in action is described below by Fox:

For us the most sustainable thing you can do is not to build a new building. And so if, let's say that there's a department head that says, you know, 'we need new lab space. We need to build new ... we don't have enough room.' And so here we could filter all the rooms that they have, we could see the condition of those rooms, how they're being stacked in terms of time and their utilization. And sometimes we can find opportunities to say, 'no, you actually don't need a new building. If you renovate two of these that aren't being well-utilized or are not in great condition, you can get all of that for half the dollars.' (Fox 2013)

Two examples of how the Visualizer was used on specific projects are described in Appendix B by Fox and Goulding, for the Ohio State campus (281-282), and by Janks, for a chemistry department (283).

Another one of the Sasaki Strategies-conceived tools is called Smart Plan. It is primarily a data organization, analysis, visualization, and alternative scenario modeling tool. The inputs are mostly information that universities or cities already track like building usage, age of buildings, populations, etc. The team can also input findings from other data gathering tools like My Campus. The team is then able to do conceptual massing and layouts, all of which have associated parameters. As the team adjusts square footage or adjacencies on a screen, other parameters like cost are affected live. Goulding gives a brief tutorial and explains that “all the objects are parametric so we can calculate how many linear feet of road we have but then we’ve assigned costs and so we can look across different alternatives and quickly see which options are going to cost more ... We quickly design here [on one screen] but it’s also informing the model there on the right [screen]” (Goulding 2013).

Essentially, Smart Plan is the software manifestation of the early idea that the designers and planners should be working simultaneously rather than reacting to the others’ decisions. Goulding remembers that “the main reason behind having this level of tool was to work at the same level as the designers were working at. Often in real time as they were designing. So if they’re sitting there drawing some roads, we can be sitting with the tool and drawing pretty much at the same speed that they are coming up with the designs. So that the moment you’re done designing, you can pretty much get some basic measurements out of it” (Goulding 2013). The live and visual aspects of the tool also allow the client to be an active part of that conversation. “During the process, you can be sitting in a room like this with all of our client group and we can be adjusting things on the fly and it’s changing out sort of the bottom line in terms of cost or phasing or square footage or the adjacencies” (Fox 2013). This aspect of everyone being constantly updated on the cause and effect of certain decisions helps to streamline the design process and avoid re-designing or possibly losing the design vision as previously discussed. Fox describes why Smart Plan provides efficiency and open communication during a design process:

From my perspective as a landscape architect, so often a plan like this will be happening and you know, it won’t be until you’re in to schematic design or design development that you start putting costs to things like the road. And so if part of this was a major green park and we were in schematic design and that’s the first point that the clients have seen what the cost of that road is and all of a sudden the road’s, you know, twenty million dollars, often times the first thing that’s going to get cut is that park. (Fox 2013)

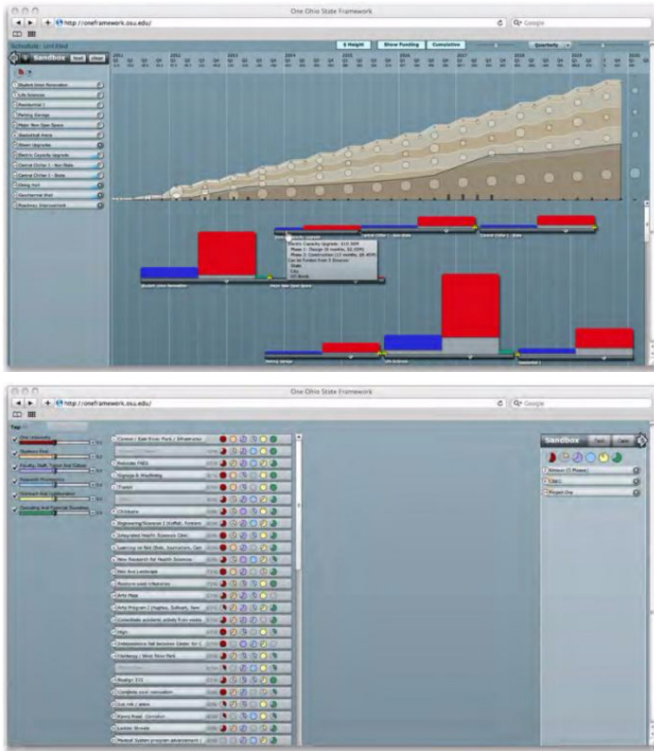
Smart Plan is also extremely valuable to a client group because it addresses not only the planning and design but takes into account their bottom line. “[The team] can show how [they] looked at three different alternatives for a plan or arrangement and building organization, and evaluated the financial consequences of each one” (Hibbard 2013). The chief financial officer of a university, for instance, would have to be doing these financial feasibility calculations anyway. So to already have that done and be done during the design process as part of the fundamental decision-making process is extremely useful to the firm when competing for projects (Hibbard 2013). “So from the very onset, a tool like this enables the client to see exactly what they’re getting into from a financial standpoint” (Fox 2013).

To optimize the outcomes of the modeling software and align it with today’s standard project delivery system, Smart Plan has the ability to export to and import from AutoCAD and Excel as well as live link (Goulding 2013, Dolan 2013). This allows for better historical documentation of projects and makes for easy comparison across projects as the team can run their model against any existing model (Goulding 2013).

Ultimately the goal of Smart Plan is to make designing and planning simultaneously agile while giving the process a sophisticated aspect of accuracy. “I guess what we’re trying to get is something between like a highly sophisticated model that’s going to get you something that’s really accurate and something that a developer’s going to be doing over lunch on the back of a napkin ... it’s all about finding that right balance for the decision-making process” (Goulding 2013). Dolan adds that “it’s really difficult to navigate that line between the detail that an engineer might bring to a project versus the planning level and agility that we want to be able to have especially in these early phases” (Dolan 2013). Using both the detail that Excel brings and the agility of conceptual modeling is what makes the process and decisions transparent to a client.

The last of the primary tools in the Sasaki Strategies Suite of Tools is The Prioritizer. It is exactly what it sounds like: a way to prioritize projects based on all of the information available and strategize for each project’s delivery. Goulding describes the process saying: “Once you’ve come up with that laundry list of things that you’d like to do, [The Prioritizer] helps you figure out how those align with your stated goals so that you can make more informed decisions about how to actually achieve those” (Goulding 2013). One major advantage the tool gives the design team is

Figure 4.9
The Prioritizer (Sasaki Associates 2013)



that it sets the client up to prioritize specific goals within a budget and avoids the common problem of value engineering wanted-items out in the end. “[An] example would just be like on a planning project, figuring out what’s the overall gross square footage you want on site, what’s the maximum height, and what’s the open-space that you’re looking for. And [the client] might say open-space is important but if their [building] heights can only go so high and they need to make the financials work, it might get squeezed out. So really forcing them to have those conversations in real time and see what those trade-offs are” (Dolan 2013). It also helps to have “everyone in the room usually at the same time to flush through these ideas and these discussions” (Fox 2013).

The Prioritizer is also beneficial to the client because it brings to the surface potential opportunities and helps the client to visually understand how the ranking of one aspect might improve or diminish other aspects and ultimately what it all means to their bottom line. Figure 4.9 shows an example of The Prioritizer in use on the Ohio State University project. The Prioritizer ranks potential campus improvement project based on their contribution to goals outlined by the university. Each sub-project is assigned a weighted score. As the team adjusts the importance of goals, sub-projects automatically reshuffle to reflect priority (Sasaki Associate 2013). Goulding further describes this scenario below:

Often the client will tell you they really care about this, you have to achieve this. But if you put this kind of tool in front of them, they’ll realize that, oh actually they care about this – something which they never even came up with at the first discussion ... often it’s something like fiscal budget versus traffic, you don’t want to put in a ton of retail even though that’s great for your fiscal budget, it really hurts your traffic and that kind of thing. So any time we find any of those kind of variables ... we put it in front of the group of decision-makers, you can really figure out what matters the most. (Goulding 2013)

Beyond prioritizing one aspect over another, The Prioritizer allows the team to visually organize project *phasing* based on priorities and available funding. “[Ultimately], we actually want to figure out how we can get this done given our budget constraints and when the money comes in ... then be able to drag the projects on a timeline and figure out whether the allocation is feasible ... In order to have enough money, you have to make sure that you’re black line (fee spent) doesn’t go above the other line (budget)” (Goulding 2013). The design team along with the client team can play around with different scenarios and come up with best strategy before any work starts, thus efficiently allocating efforts towards the concepts that are most realistic.

The Sasaki Strategies' Suite of Tools was conceived to make the analysis, design, and decision-making processes most efficient. By spending time upfront figuring out the most realistic course of action for the most well-informed design, (and hopefully the projects with the longest lifespan), the firm has reduced wasted time, making this particular form of research profitable. And because it’s targeted research, it’s integral to the overall process. “I think we do it as part of ... solving the problem ... So it doesn’t cost any more ... If we have to invent something, I think it gets invented as part of a project ... It’s integral” (Hibbard 2013). In addition, once made, the tools can be used on future projects with minimal alterations. “Through the process of trying to evaluate and solve these problems or be able to visualize the data, we end up creating tools that often can be used for other projects and in other places in the world” (Fox 2013).

As integral as the deluge of data and analysis is to the Sasaki evidence-based design process, the Strategies group still considers their process to be a creative one. As Hibbard puts it, “creativity is an exercise in finding meaning and finding significance towards a particular end” (Hibbard 2013). The software certainly does a lot of work, but the planners and designers still need to exercise judgment of what’s important and what’s not. And that’s still, to me, the key intellectual ingredient. Not everybody can do that” (Hibbard 2013). Sasaki agrees that the Suite of Tools itself is a product of creativity. “Discovering something, discovering relationships, discovering intelligent patterns that work to solve your problem better than others” is part of the creative process (Hibbard 2013). In that respect, the creativity in the design process has not changed due to the evidence-based design Suite of Tools. “It’s changed it but it hasn’t fundamentally changed any psychological function that has to be performed at some point” (Hibbard 2013).

Implementation and Components

The components developed to support Sasaki's EBD approach are directly related to the Sasaki Strategies group and the Suite of Tools. These components include the tools themselves as a coordinated vehicle for design, a library for the tools to be housed, and in-house programmers and software engineers to design and develop the tools.

The Suite of Tools at Sasaki is both part of the design process as well as a collection of individual components that supports a larger evidence-based design approach. Tools like My Campus, The Visualizer, Smart Plan, and The Prioritizer support the decision-making process and give the design and planning team that high level of feasibility. As Goulding puts it, “[the tools are] not directly tied to decision-making, [they’re] just about understanding what you have so that you can make a better, more informed decision” (Goulding 2013). Although the Suite of Tools is primarily developed and used in the campus and masterplanning studio, The Visualizer and The Prioritizer have a broad reach and have been used in other studios as well (more on the expansion of the Suite of Tools in the Future Trends, Goals, Fine-Tuning section). Although each tool emerges as an answer to a specific project need, the tools are flexible and replicable enough to then become available for anyone else in the office to use on future projects – giving the firm as a whole a tool for evidence-based design. Fox explains, “eventually at some point, we start kind of modifying the tools so it can be more easily replicated and used on other projects ... So for instance, we may have created tools specific to Ohio State but now those tools are being used by regular project teams throughout the office in a slightly different, more modified form” (Fox 2013). As for the funding of the development of these tools, the firm has invested in the Strategies group and their products. Each tool has a history with and emerged because of one specific project and its need; but because the tools are almost always destined to be utilized by the rest of the firm on other projects, the cost of development is not the responsibility of any one client. Instead, project fees at Sasaki are designed to include the necessary overhead to develop and manage the Suite of Tools.

With tools finding their way into more and more projects, the Strategies group developed an in-house digital library to make the tools accessible to others in the office. “We have this site ... which outlines everything we have and everything we’re kind of coming up with ... we came up with this site just as a way to share everything that we’re currently involved in” (Goulding 2013). The site is organized into three categories based on each tool's readiness to be applied on a project. The categories are: established tools that are frequently used on projects and can be

picked up for future use as they are; emerging and experimental tools that might have been beta tested on a project but cannot be readily applied to a new project; and last is the category of tools “looking for their big break ... they’re just sitting there on the wings and waiting” (Goulding 2013). The library is updated by the Strategies group as the Suite of Tools evolves.

A major personnel component of the evidence-based design approach that allows the firm to produce these pieces of personalized software is the software engineers themselves. Goulding is the primary software engineer working within and collaboratively with the Strategies group to build each of these tools and customize them per project. “Someone like Raj [Thiyagarajan Adi Raman], who’s a programmer, is doing a lot of really focused work for projects ...” (Dolan 2013). The programmers are a crucial aspect to the Strategies group, all of whom “are interested in innovating and trying to pull data and solve problems in unique and different ways” (Fox 2013).

When it comes knowledge sharing about the Suite of Tools, there is no formal way that the Strategies group disseminates information beyond the in-house digital library. Goulding acknowledges that “[they] give presentations once in a while ... And a lot of it’s just word of mouth ... It’s kind of more organic. It’s very hard for us to broadcast in a meaningful way so that anybody’s going to think of it next time they have a need for it, unless they’ve actually seen how it’s used on another project ... [if] they’ve used one of the tools and then they see a potential for that tool to be used on another project, then that’s often how it spreads” (Goulding 2013). Members of the Strategies group have their own projects that they work on and as they move from team to team, over time, knowledge and use of the tools continues to grow. “We’re also trying to just sort of spread the use of the tools to different areas of the firm. So Alex downstairs is not part of Strategies, but she’s the one who really has pioneered Smart Plan in a lot of projects. There are people who are really within the group but the ideas are meant to be dispersed and strengthened throughout the firm” (Dolan 2013). An unforeseen advantage of this informal dissemination of tools is that the tools actually have evolved because of the misinterpretation of word-of-mouth information. “Someone will see it or hear about it and they’ll ask Ken about it and what they had in their mind about how the tool functions or what its aspirations were may be different from what the tool currently does. And so then the tool gets modified or added on to in more layers and gets more dynamic. And so it’s kind of a nice way in that regard that it’s not: here’s what it is, here’s

all it can do. I think even just the word of mouth often helps grow the tools and makes them more useful over time” (Fox 2013).

Overall, the components that support the implementation of Sasaki’s evidence based design approach include the technological software, the Suite of Tools library, the software engineers, and the Strategies group (more on them in the Firm Organization section). The software itself is the most formal approach because it is tied directly to the design process. The other supporting components are more informal and dynamic to meet the changing needs of the tools’ applications.

Firm Organization

Sasaki’s evidence-based design approach has benefited from and been formed out of two primary firm organization initiatives: the Sasaki Strategies group and a diverse team makeup. Sasaki Strategies is loosely defined in that no one is required to be in it nor are there specific characteristics of its members. It is made up of people throughout the studios who have their own project work under different principals but who have a common interest in developing and implementing new tools for data-driven design (Fox 2013). Dolan remembers that “one phrase they told me when I was interviewing was that it’s an ‘interdisciplinary think-tank,’ so it really brings a lot of different approaches to the problems” (Dolan 2013). The group of diverse minds meets regularly to work on solution tools. They will then return to their project teams and share what they have learned from the Strategies group about the firm-wide approach and the Suite of Tools. Knowledge is disseminated throughout Sasaki’s studios in this way.

The Strategies group is therefore structured as a derivation tree, although not top-down but rather horizontal throughout the firm. Greg is formally the head of Sasaki Strategies but he is not the one dictating the group’s tasks; “it’s usually someone on the team, like Ken, who comes up with an idea about how to solve one of the problems he’s heard about on [a] project” (Fox 2013). The core team is the one to develop the tools but then they are able to share those tools and be the trouble-shooters among their project teams – the knowledge spreads in that manner. In this way, the firm benefits from growth, innovation, and diversity without jeopardizing billable time.

Hibbard says, “I don’t think [evidence-based design] has changed the overall organizational diagram. I think it’s changed who’s in the diagram” (Hibbard 2013). It has required a wide range of professionals and experts to address complex problems meaningfully. Any project at Sasaki will have a hand-picked team that

will be the best in addressing specific issues. As an interdisciplinary firm, most of the projects have architects, landscape architects, planners, and Sasaki Strategies people all on a team (Fox 2013). By doing this, “everyone’s in the room usually at the same time to flush through these ideas and these discussions ... at least this way everything’s visible and transparent and everyone gets a voice. So that at the end of the day, the client’s getting the best result and the most informed decision because there [are] all these different individuals coming to the table and being able to see their element of the project as transparently as possible” (Fox 2013). Being that project teams are oftentimes so large and diverse, there is a lot of cross-pollination between them, which is one of the primary ways knowledge and resources travel so fast through the firm.

The change to who is in the diagram has also led to a large amount of project team members from non-designer backgrounds. Hibbard says the non-designers and non-planners by background who have good organizational skills, great computer skills, who have mathematical or financial backgrounds, are the ones who add another dimension to Sasaki – it’s bringing in another type of expertise (Hibbard 2013). This increase in “numbers people” at Sasaki evolved over the many years that Sasaki has gone through justification processes to persuade people to invest, whether its donors or the state legislature. This is referred to as the programming or masterplan level programming for facilities. Sasaki used to hire sub-consultants to do the programming. Using normative standards and their understanding of the physical conditions on campus, they would provide a facilities program. Hibbard remembers: “there was always a tension between us, the physical planners, and the more abstract exercise of programming. These guys were always sort of like accountants and they had a very linear, numerical mindset and were less involved and interested in the overall spatial organization of the campus” (Hibbard 2013). Sasaki instead started hiring people who had not only the planning background but had the abilities of programmers as well. At first it was a directive for newly-hired Greg Havens out of MIT (now one of the principals) to get involved in academic and space programming (Hibbard 2013). Thus Sasaki got involved in the programming business; “there’s this connection between planning and programming that we now can facilitate” (Hibbard 2013). There are planners coming out of school now who have that integrated into their education and those are the people Sasaki is hiring for the Strategies group (Hibbard 2013). They are integrated into the project team and because they have data processing skills and can compile, organize, and analyze data in a unique way, the project analysis is more comprehensive and solution-oriented (Hibbard 2013).

Design Culture

Another example is Greg Janks who has a financial background. “We can begin to take our plans that we developed and evaluate them financially, which we never used to be able to do before Sasaki Strategies (Hibbard 2013). Hibbard says that that was typically a function done within the university itself. Having this service in-house is also a marketing advantage in addition to adding multiple areas of expertise to project teams. “I think what we do now is bring in outside objectivity to that task where we can do benefit-cost analyses for different planning moves where we were never able to do that before without that sort of cadre of individuals” (Hibbard 2013).

The design culture at Sasaki that supports evidence-based design is one of self-motivation, collaboration, self-assessment, and an open floor plan to match. Hibbard admits that it’s hard to discern if any of these cultural attributes are a direct result of the evidence-based design approach; he says, “when you’re in it, you don’t see [evidence-based design] as affecting [office culture]” (Hibbard 2013). There is also a general sentiment that designers at Sasaki are the type of people driven to the evidence-based type of work, that “there really isn’t any persuasive activity that needs to take place that people do it” (Hibbard 2013). The design teams are largely self-motivated to practice the evidence-based design approach of the firm and individual team members are encouraged to share their voices or lead the team to use a data driven tool. “It’s people working together and contributing ... and feeling that [they are] all part of one problem solving exercise and working together” (Hibbard 2013). Hibbard adds that “it’s not difficult [to share in the mission] if people are just aware of it” (Hibbard 2013).

“Sasaki design culture has rarely been about isolated individuals working alone. And that goes back pre-technology, and it’s true today” (Hibbard 2013). The teams at Sasaki are quite large and diverse, so constant collaboration only benefits the project. Advances in technology over the years (alongside development of the Sasaki tools) have only amplified the need to be collaborative purely based on the speed of design. Things happen so quickly and information assembles so quickly that it has become almost impossible to be an isolated, individual designer in this climate. “That’s not to say that individualism and individual talents aren’t recognized. It is individuals who make decisions and initiate designs” (Hibbard 2013).

The non-siloed office culture is also reflected in and supported by the physical layout of the office. The building is an open floorplan with big work tables in

each pod for joint work sessions (Hibbard 2013). Hibbard admits that Sasaki has been an “office without offices” ever since he joined the firm in the late 70s (Hibbard 2013). Principals never had separated enclosed offices. As previously mentioned, there is very little individual work so there are very little individual cubicles. The group work (as necessary for their EBD approach) requires group pods, so “there’s been a little bit more breaking down of the individual cubicle ... I think where we are today is kind of an evolution of where we’ve been” (Hibbard 2013). If a larger project comes in that might run for a longer duration, the firm sets up a project team pod just for that project (Hibbard 2013). The big workspaces and the collaborative spaces are what has always been part of Sasaki’s collaborative identity.

Sasaki is full of analytical thinkers – as evident in the case-study thus far. Data analysis and research is so much part of how they understand space that they will even turn the lens on themselves and test tools in-house. When the Strategies group first introduced the My Campus tool, they pilot-tested it at the Sasaki office with employees. They asked staff to use the tool to diagram information like how they get to the office, how they circulate through the building, which bathrooms they use, and drawing lines to show who they most often work with. Fox remarks, “even at a building scale, almost a room scale, I mean that was really compelling and we found some really interesting trends among what our own staff are doing within our own building which we *think* we all understand very well but it showed some things that we don’t often understand very well” (Fox 2013). This type of activity shows just how ingrained the curious and analytical culture is in Sasaki’s daily practice.

Clients and Client Relations

The type of client Sasaki often contracts with is one with a complex problem needing a complex solution. Clients typically come to the firm with a lot of data that they are unsure what to do with, or they need data that they know they do not have. In any case, clients most often come to Sasaki knowing they are getting the depth of analysis the firm is known for or that they are specifically seeking out that expertise. Hibbard suggests that the client types have not changed much over the years but the way in which design teams interact with those clients certainly has.

Due to the flexibility, instant results, and visualization properties offered by Sasaki’s Suite of Tools, design teams can actually use the tools with their clients in the room: moving things around, adjusting inputs and outcomes on the fly, prioritizing goals to see cost-benefits, and getting instant feedback on things the client cares about (Fox 2013). The client is able to not only see that their voice is being heard

but they also understand the thought and evidence that went into making design decisions. Goulding comments, “I think it’s most effective use is when you can get a small group of decision-makers in the room and really use it as a tool to move the discussion forward, to be able to understand exactly what the client wants out of the design in terms of the data that it’s generating” (Goulding 2013).

Showing clients the process for basing design decisions off of evidence and the tools themselves is important when trying to leverage those decisions. Dolan explains, “a lot of times clients will sort of challenge some of our assumptions of [for example] where the energy is on campus and we can point to it and say, ‘this is what your people say.’ So it’s used kind of as backup” (Dolan 2013). Janks also expresses that with the type of projects Sasaki gets – often large, campus, and civic projects – there are diverse sets of stakeholders with strong opinions and that are often politically charged. Coming to a common solution in that climate is almost impossible without a data-driven approach (Janks 2013).

Sasaki has built a significant degree of trust with their re-occurring clients; the use of the Suite of Tools to do analysis comes with basically a handshake agreement (Janks 2013). “A healthy client relationship entrusts more freedom to the project team to explore novel ideas, test assumptions, and continually change the design based on the evidence” (Goulding 2016). Janks remembers one particular project: “we knew what the problem was, we knew that, with Ken’s leadership, we could give them some very good solutions. So we talked about it quite a bit and then at the end we said [to the client], ‘is it okay if we think of these three pieces? And we think they’re going to be something like this. Do you trust us?’ And they said yes” (Janks 2013). Sasaki really does not get clients who oppose *some* form of data-driven analysis – this is just the type of clients the firm attracts. They will still see clients who do not necessarily want to go to a great level of depth on the data collection and data maintenance. For example, Goulding points out, “certainly smaller schools get less ... I think [they] can keep things in their heads more readily if [they’ve] got eight buildings than if [they] have eight hundred” (Goulding 2013). Janks goes on to say, “even with the eight-building school, there’s analysis that can help inform decisions even if [the client] doesn’t necessarily support the whole Suite of Tools” (Janks 2013). Therefore, a great deal of data mining on Sasaki’s part is not always necessary to the project scope. Throughout their work, Janks mentions seeing an evolution in clients’ attitudes towards their work: “I think more and more folks are sort of seeing the value in it and are very grateful for it, very hopeful for it. So we’re not really encountering a lot of

resistance” (Janks 2013). This marks a pivotal time for not only Sasaki but the field as a whole and how they produce work for clients.

The work at Sasaki that most applies the evidence-based design approach are their large-scale planning efforts including higher-education campuses and urban planning. Hibbard does not believe that the type of work the firm gets has fundamentally changed as the evidence-based design approach has developed; but he says, “it has a new dimension, it has maybe greater relevance to a given client’s needs” (Hibbard 2013). The programming and financial analyses aspects – the backbone of physical planning – are more robust than they used to be, likely because of the development of that in-house expertise (Hibbard 2013).

Sasaki does a lot of renovation work as part of their campus planning, architecture, landscape architecture, and interiors design scope. Therefore, understanding how people use the existing facilities and spaces are fundamental to the firm’s work and what ultimately inspired the Suite of Tools (Goulding 2013). As mentioned in the previous section about clients, the larger schools tend to be the ones needing the most help with organizing and reading their large amounts of data. Smaller institutions are likely to be less interested in the types of analysis Sasaki does because they do not require the complex data collection and analysis that some universities have on file.

Goulding also mentions that when Sasaki enters into design competitions that are more hypothetical, or as he describes it, with a more “academic” design focus; there is less of a direct impact and therefore more difficult to incorporate EBD (Goulding 2016). This is especially true with the restrictive timeframes of design competitions. Goulding has also observed that “projects restricted to ‘box checking’ and where analysis must be restricted to a single phase that must be closed out before design begins [is obstructive to a true EBD process]. Design and analysis work best when intertwined” (Goulding 2016).

Overall, Goulding expresses that the types of project that benefit most from EBD are the ones where “analysis becomes an integral part of designing through the life of the process. [Projects of any type] should be open to change and learning as part of the process. A team should not be expected to have all of the answers from the initial RFP stage” (Goulding 2016).

APPLICATION

Consultants and Consultant Relations

Sasaki has a close relationship with its consultants because they recognize that they cannot know all of the answers all the time. Design teams instead rely on consultants for knowledge, experience, and evidence. Goulding discusses that the most impressionable phase, the RFP phase, would benefit most from having consultants weigh in, yet it is the phase where the extent of issues has not even been identified yet. This makes it hard to specify all of the consultants at the RFP stage. Instead, Sasaki teams "make use of a number of 'on-call' consultants across a variety of specialties who can address questions as they arise. This lets [teams] leverage EBD across a range of projects and to do so in a more impactful way (Goulding 2016).

Marketing

Sasaki has developed into a firm that clients seek out specifically for their expertise. As the evidence-based design approach gains more and more traction, clients hire Sasaki because of the overall ability to marry design and analysis (Janks 2013).

The evidence-based design approach at Sasaki – namely the suite of data tools – really markets itself. The tools are used two-fold: 1) to answer problems for the client at hand but also 2) having those examples of the tools' capabilities to show other similar clients "is very persuasive" (Hibbard 2013). Hibbard suggests that the tools market themselves purely based on what they are and that other firms do not have it; "it's not just showing [clients] the methodology and the tools and so forth, I think it's what it is that makes it attractive" (Hibbard 2013). It is really the financial implications portion of the tools that give physical planning meaning to potential clients. To a potential CFO client, this means he/she does not have to do that work on their own separately from the designing process – it is a winning combination (Hibbard 2013).

Sasaki's marketing brochures do not speak directly about "EBD" or "evidence" but the narratives (especially in their Campus Studio brochure) clearly describe an inherent analysis process and "innovative decision support system" (Sasaki Associates 2013). Use of tools such as the Visualizer and Prioritizer are described and snapshots are shown as part of marketing this segment of their scope. Their Sustainable Solutions brochure is flush with quantified performance benefits as examples of the firm's credentials in a number of sustainable categories (Sasaki Associates n.d.). The firm's "Research and Ideas" tab on the website is full of employee-authored articles which tend to be reflections on current work or others' research rather than the firm's own published research. The firm markets itself as being well-informed and critical, and the sheer number and frequency of these public posts certainly reach those who are looking at Sasaki for potential work.

PROPAGATION

Reporting

Sasaki designers will occasionally publish written works or speak at universities and conferences. Their evidence-based design processes and suite of data-analysis tools, however, are not commonly the topic. Hibbard, for example, used to do visiting lectures at universities and would write things from time to time including a contribution about site development and campus planning to the APPA: Leadership in Education Facilities' peer-reviewed online resource, "The Body of Knowledge". Janks and others have increasingly had a presence at APA and ASLA conferences noting that "any change is difficult. But overall the reception [of material] is overwhelming" (Janks 2013). As of now, speaking engagements are typically project related rather than office-wide process related and publications are done in non peer-reviewed literature.

Hibbard remembers that Hideo was not much into speaking or publishing although he encouraged his younger partners to do it; "Hideo was a prominent figure and he didn't relish doing that kind of stuff at all. He never wrote. I think there's only one or two things that he ever wrote for professional journals" (Hibbard 2013). While others at Sasaki have excelled at this art, perhaps the culture for reporting is not as strong because it was not one of Hideo's main interests. Hibbard further explains, "I guess you have to have a culture that supports it, which we've always had. But you also have to have personalities that want to do that kind of thing" (Hibbard 2013).

As for the tools themselves, sharing can come in the form of community involvement and open-sourcing. Since Sasaki deals so often with large communities whether it be city-based or campus-based, the tools themselves are certainly known and experienced through crowd-sourcing efforts. If it reaches the professional community, similar tactics and knowledge may be gleaned from simple public usage. For instance, Sasaki curated an exhibit called Reinvention in the Urban Midwest which was on display at a public workshop space in Boston during the Summer of 2013. Here, people were able to play with the data gathering software on tablets and immediately see their responses in the larger context.

The other form that the tools can reach the professional community is through open-sourcing – something that has already been taken advantage of by Sasaki. During the regional planning project for Des Moines, a group who developed planning tools approached Sasaki to open source the tool. Sasaki worked to rework some of the code and make it more portable. This form of the tool has been used on a couple of that group's projects as well as Sasaki's Northeast Ohio regional planning project.

Overall, Sasaki's reporting culture is more aligned to the specific project or specific analysis than it is to general information about the firm's process or approach. The firm is more pragmatic than generalist when it comes to reporting.

Collaboration and Outreach

“Sasaki's practice has always been enriched by its connections to academia – whether through the legacy of Hideo Sasaki's teaching-based model, the firm's ongoing commitment to campus planning and design, or teaching engagements at schools across the U.S. and around the world” (Sasaki 2013). Goulding notes, that while the primary form of interfacing with academics is as consultants, a number of Sasaki professionals have or are currently teaching at a university (Goulding 2016). In addition, representatives from Sasaki will occasionally travel to universities or have classes come to the office for various charrettes, critiques, and committees. The employees at Sasaki will also often serve as jurors for local, national, and international competitions and awards. Through these engagements, Sasaki can spread their values of decision-aided analysis and research. Overall, Goulding describes, “We have an internal research program, but are less involved directly in research with academic institutions. We are considering deeper involvement in direct research with research institutions, but haven't found the right model for this” (Goulding 2016).

Future Trends, Goals, and Fine-Tuning

Looking into the future, the Sasaki Strategies group hopes to see the expansion of their existing Suite of Tools into other disciplines as well as into the built-work projects at the firm. Janks states that most of the Sasaki Strategies' tools are campus planning based right now. “We'd love to take the mindset and apply it more to built-work projects amongst other things ... And get at different market sectors” (Janks 2013). Fox describes that with all of the certifications like Sustainable Sites and LEED, landscape architecture built work can act as inputs for the Suite of Tools: “something as simple as designing an allée of trees and giving that an input of how much carbon sequestration those trees at a certain age could provide ... We could display that information ... and actually if you want to achieve a certain target, [decide that] we're going to need seven-times this, and very quickly be able to let that sort of drive some initiatives. So I think we'll start to see more and more of that kind of input into our built practice as well” (Fox 2013).

Looking at built-work opportunities, the Strategies group is also targeting the architectural side of the firm. They have already tested the My Campus tool within their own Sasaki office building and see its value in other room

and building-scale applications. Goulding says they see it as a potential post-occupancy survey tool as well (Goulding 2013).

Existing tools like My Campus have come a long way and are “used all the time, for lots of different things. And people find applications for it. So you could say we’ve sort of reached a plateau with that, but there’ll be something else” (Hibbard 2013). When asked about new tools coming onto the Strategies scene, Dolan refers to energy systems analysis as something they would like to get into more. She says, “we haven’t found a partner that has been able to kind of understand these engineering calculations in a way that can be expanded or generalized or scalable ... So that’s kind of one of our next challenges probably” (Dolan 2013).

As for how Sasaki sees its initiatives within in the larger professional context, Fox says a lot of what Sasaki is doing is pretty new to planners and landscape architects. “We’re seeing a lot of new surveying technology out there ... tied to financing, tied to allocating things over time, scheduling; I think that’s relatively new” (Fox 2013). Overall, Hibbard says, “I can’t imagine that the applications or the types of problems or the questions are going to dry up... there will always be additional things and problems to solve” (Hibbard 2013).

OLIN

Office locations: Philadelphia, PA; Los Angeles, CA

Year of Establishment: 1976

Total Number of Employees*: 81

Number of Landscape Architecture Staff*: 70

Firm Philosophy, Values, Mission: OLIN's work is predicated upon social engagement, craft, detail, materiality and timelessness.

Type of Work / Specialization: Institutional, higher education, corporate campus, urban plazas, urban planning

Firm's Definition of Evidence: "Evidence is the result of primary research that is designed to answer specific questions and creates new information or a new application of existing knowledge" (Toronyi 2016).

Firm's Definition of Evidence-Based Design: Evidence-based design is the application and practice of utilizing primary and applied research findings to shape and guide the design outcomes of the built environment" (Toronyi 2016).



Figure 4.10 OLIN Philadelphia Office (Photo by Elise Fagan)

NATURE + EMERGENCE

EBD Approach

OLIN's evidence-based design approach is characterized by the pragmatic application of existing and produced evidence to the specific complex project at hand where evidence helps to define the identity driving the project while addressing the critical "why" of the problem. OLIN's EBD approach varies largely based on the partner in charge but the application of evidence to solve complex problems is inherent to the firm's processes. So much so that Skip Graffam, Director of Research and Chris Hanley, Director of Technology (both interview as part of this case study) both described the approach as being embedded, implied, yet not articulated. There is no checklist for every project. While there may be some broad categories that every project has to address, "the percentage of the importance or impact or need to research each of those may vary completely" (Graffam 2013). Rather than a one-size-fits all framework, the application of evidence depends on the scale, context, and impacts of each unique project. "It is the art and science of this profession" says Graffam (Graffam 2013). The one overall framework that is in place at OLIN is the array of expertise that ensures the right evidence is answering the right question. Karl-Rainer Blumenthal⁶, the Research Librarian and Archivist at OLIN, was also interviewed as part of the data collection for this case study.

One manifestation of expertise at the OLIN is the Directorship. It comprises three directors that lead cutting edge discussions and applications in the fields of Research, Technology, and Green Infrastructure. While they have their own billable work, each director lends their certain expertise across the board to guide teams to push the limits in all three aspects. Skip Graffam, the Director of Research, is widely known in the profession for his research. He describes the role of research as "set[ing] our work in context both physically and also scholarly if you will. What has gone before? What didn't work? What can we do better?" (Graffam 2013). Chris Hanley, the Director of Technology, focuses on developing and implementing emerging design technologies. A designer's tools are so much more than just communicating design but now they hold so much information that can be used to evaluate performance during the design process. Steven Benz is the Director of Green Infrastructure, and although his expertise involves both research and technology, he was not involved in this case study. All three directorships are closely aligned with the application of evidence-based design at the firm.

OLIN's pragmatic approach is derived from their goal to make concepts a reality, to design everything to be built. Their use of evidence reflects this

⁶ As of publication date, Karl-Rainer Blumenthal is no longer an employee at OLIN.

Finding and Producing Evidence

charge. However, it is not only using evidence conceptually to define the “why” and convince clients of the vision, but also to inform how these solutions are fabricated, installed, and built the way they were designed. How will people interact with the design and how will the design develop over time? These questions are answered through thorough analysis and application of evidence.

The type of evidence used in OLIN’s EBD approach is as variable as the approach itself. However, the type of evidence required directly responds to the research question posed. Nevertheless, Hanley makes clear that “the mechanisms by which we gather that evidence are pretty robust” (Hanley 2013).

One of the more formal mechanisms by which the firm gathers evidence is through their digital Knowledge Base which will be discussed in the Implementation and Components section of this case study. The evidence found in the Knowledge Base resembles an internal, searchable database of journals, articles, precedents, and experts. It is used largely for the traditional literature review to establish the context of a project or problem (Graffam 2013).

OLIN also utilizes GIS information and has many data sets available to them. Similar to the McHargian method⁷, they are able to apply and layer information spatially to learn about project sites and context. Most often, these data sets are environmental factors like slope ratios and aspect. Physical research at the site also becomes spatial layers of information to analyze. An example of this is perceived noise at the pedestrian scale.

In addition to GIS, Building Information Modeling (BIM) is used as a design tool to retain complex information for use in analyzing performance at various phases of the project. For instance, Hanley describes that when “we’re putting in trees, we’re not just dropping in a circle on a plan; that tree has information associated with it and it has values that feed into some of these pre-built site restraints that we know during the design process. The impact of our design solution is being measured ... But the reason for embedding that information, that evidence, is that we need to be able to clearly articulate the result of our design” (Hanley 2013).

Another type of evidence used is the expertise of people in related professions like ecological engineering, urban forestry, bioscience, and sociology but also in

⁷ In the 1960s and 70s, Ian McHarg advocated that “the study of physical and biological processes, as dynamic and interacting, responsive to laws, having limiting factors and exhibiting certain opportunities and constraints, [should be] employed in planning and design for human use” (McHarg 1967). He developed a method of overlaying data spatially to “reveal nature as process, containing intrinsic form” and his method was “tested empirically at many scales...” (McHarg 1967).

seemingly unrelated professions. The foundation for qualifying design decisions, Hanley says, is that “we find the people who are the most skilled at what they do [to] help inform our process” (Hanley 2013). This has come to fruition in several cases of out-of-the-box design such as the design of Director Park where the design demanded bending a certain type of wood that had already been chosen for other beneficial qualities. While the existing evidence told them it could not be done, the designers were insistent on finding a solution rather than compromise the design. So they found a Pacific Northwestern artist that understood the intricacies of bending the wood in such a way that did not violate the structural integrity. And thus the team – by disputing the existing evidence – was able to prove something that was previously unknown in the profession (Hanley 2013; Graffam 2013).

Less quantifiable is the awareness of culture, processes, and systems that the designers try to design with. Observing people in spaces, tracking trends, and gathering news are all sources of qualitative information that play into the design process. Hanley however admits that this is something that they are constantly trying to measure and have not found valid methods to do so.

Hanley makes a distinction about OLIN’s use and application of evidence that is thematic of their process: “the level of evidence that you take into consideration when you input a project is all predicated upon your understanding of that evidence – your skill set” (Hanley 2013). Just as the level and types of evidence vary depending on the demands of each project, each designer’s handling of the evidence is unique and also determines how it is ultimately applied.

Development and Evolution

The origins of OLIN’s evidence-based design approach lie in founders Laurie Olin and Robert (Bob) Hanna, both of whom were faculty members at the University of Pennsylvania at the time of the firm’s founding in 1976. “Laurie’s very fond of saying that the studio happened by accident,” remarks Hanley. Both Olin and Hanna came to Philadelphia to teach; they researched as professors, set up a studio, and then people began approaching them as practical problem solvers. With a few hires to help figure things out, the studio was born (Hanley 2013). This academic foundation framed how the firm approached projects. Olin and Hanna always addressed their projects like they were addressing a problem statement (Hanley 2013). They also were habitual in setting their work in context – a more academically prevalent expectation. Both were driven by their academic backgrounds and helped to establish the academic traditions of OLIN. Today, every partner teaches to some degree or another (Graffam 2013).

The first application of evidence for the young OLIN firm came in their first project – the Johnson and Johnson Headquarters in New Brunswick, New Jersey (c.1978) – when they were faced with the need to prove performance to a client.

It was one of our first projects and one of the first commercial projects that addressed the issue of using meadows instead of lawn. The evidence was gathered by ecologists proving the value through maintenance records, environmental [studies], all of the things that are good about a meadow instead of using a lawn ... There was that need to bring in specialized consultants to help prove, not only to the client, but also to the design process ... The design notion of saying 'a meadow' has a very beautiful aesthetic value [is strong], but let's really substantiate it with the environmental value that it's adding to the project. And that was done by bringing in consultants, which we still do. (Hanley 2013)

The Johnson and Johnson Headquarters project was important in setting the tone for the types of complex projects that OLIN continued to attract. Graffam comments that “you would think that if you were starting a project for the first time, you would pick an easy project. But no” (Graffam 2013). OLIN specialized in taking on the complex projects of the day. Olin and Hanna looked at each project as having to address a series of problems and challenges while trying to make it look beautiful and artistic – an aesthetic response (Graffam 2013). And in the early years of the studio, the expectation to make informed decisions based on available evidence was just what they did. Problem solving in design always came back to the “why” – “why you're doing design and how you're going to substantiate that” (Hanley 2013). It was a vision that Olin and Hanna established for the young firm and it dictated the types of projects the firm took on in the future.

The Directorship at OLIN began to evolve in 2007 but its origins lie in the founding of the firm. “In the first partners' implied design decisions, there were always these tenants of education, ecology, and technology (not necessarily the digital form but the technological aspects and complexities of systems working together” (Hanley 2013). Olin and Hanna pursued a clear design vision founded in research and hired designers that aligned with this vision. “The discourse between this first group was probably rich but focused on those areas of research the founders were pursuing” (Hanley 2013). As the firm grew, the way in which those tenants were communicated and explored started to require a different framework – to begin to organize all of the voices and information – and so the

Directorship was born. The original tenants of education, ecology, and technology became directorships of research, green infrastructure, and technology; currently Skip Graffam, Steve Benz, and Chris Hanley respectively. The directorship will be discussed later in the Firm Organization section.

The greatest evolution in the firm's evidence-based design culture has been the generations of partners and how each treats the process. Even the simple definition of evidence-based design and the application of it in the design process vary between generations. "For the founding-era-level partner, a lot of that evidence is sort of intuitive in their process, so they might not have necessarily articulated it. And at that time they [were] beyond some traditional methods of the generic site analysis and things like that. There was perhaps not an articulated evidence-based design process; it was implied and embedded in the process" (Hanley 2013). The next generation of partners "has a desire to refine and build on what evidence-based design means to our practice and how we achieve it" (Hanley 2013). Hanley believes this next generation will benefit the most from all the previous partners' experience and will be able to clearly say, "these are the things that clearly informed our design process. And here's the qualitative aspect of them and here's how we proved them out and explored them" (Hanley 2013).

The future of evidence-based design at OLIN lies in finding relevant evidence and defining new metrics based on the cultural changes happening in the world. As society evolves and technology evolves, so too does OLIN's evidence-based design process have to evolve. In the founding years, the strokes of pen on paper held information that was intuitive to the designer – a circle meant something specific to the design that only the designer knew and could be conveyed verbally. In the current generation of defining the process and defining evidence-based design, designers now have to "deconstruct that information to find what's making it truly purposeful. And all of that information then needs to be embodied in the product they develop to clearly articulate the result of their design" (Hanley 2013). Some of the evidence about public spaces that was widely known during the founding years of OLIN is now no longer relevant. Hanley explains that, for instance, the proliferation and constant use of the cell phone has changed how people interact, move, and experience a space. Research that was relevant fifteen years ago about public space, seating, and random encounters of interaction have changed drastically in this digital age of mobile information. "The question then is how do you define those new metrics and how do you evolve your evidence-based design concepts to now include and evolve those new metrics?" (Hanley 2013).

INTEGRATION

Design Process

OLIN's evidence-based design process is an intuitive process to them, meant to answer the question at hand with a thorough collection of evidence from numerous sources and a practical application to address problems throughout the project's life. It is important to OLIN that this collection and application of evidence be completely ingrained in their design process. "Research on our end is very much about working within the flow of projects," remarks Graffam (Graffam 2013). The firm has made a point to design a system that works within the project work flow that also (maybe most importantly) fits into the project budgets. Hanley adds that "the definition of the cost of doing the job is becoming much more encompassing" thus allowing them to do what is required of their complex projects and do it within their allowed means (Hanley 2013). On the Canal Park project, for example, the design team is doing post-occupancy evaluation in order to meet the SITES criteria. This was something that was expected from the SITES process and therefore accepted by the client. In the same respect, sometimes the research is part of the overhead costs of the firm but it is beneficial to multiple projects because it addresses a common thread of challenges. OLIN, as a firm, has been able to move away from the idea that research at the firm is a separate line item on a client bill. To them it seems as ridiculous as having CAD operations as a separate line-item in today's digital age – it is just a necessary part of the process (Graffam 2013).

Being able to collect and analyze the right data starts with identifying the goals, client aspirations, design aspirations, metrics, and challenges of the project (Graffam 2013). Often, these questions will be developed into a research framework that answers the needs of the project. At that time, the team develops one or two research items that they can pull out and explore in greater detail and even at different scales (Graffam 2013). Sometimes criteria and goals identified in those initial brainstorming sessions conflict: "like open space versus energy production and housing versus agriculture" (Graffam 2013). There is then a process for "finding the sweet spot in each particular area and identifying how all of those factors come together" (Graffam 2013).

Before, during, and following the project's initial kick-off phase, the design team sets aside time for collecting enough research to provide context for the project and its subsequent challenges. "In order to solve a problem, you have to set it in context and you have to do research and you have to understand it. And you have to understand it from all the different participants' points of view" (Graffam 2013). Sometimes an OLIN project comes with a pre-determined problem statement and certain calculations that need to be met. More often, however, a project does not come with

a prescribed dilemma and the team has to do the work to identify the challenges of the project through initial data collection – whether it is on-site, using digital data tools, or talking with different stakeholders. With the help of the Director of Research and the in-house research librarian, the team also has to identify the right kind of data for each topic of research. Graffam, as the Director of Research, fully understands that “you can literally drown in data. It requires an enormous amount of critical thinking to understand what is the essential information” (Graffam 2013). Hanley adds that there is no systematic process, no checklist for identifying the right data and the right metrics for every project since each project has different influences that will shape the kind of research it requires. The team can look to similar project research (if it has been done) to start identifying appropriate metrics and methods but essentially it is a new process every time.

Research at OLIN does not stop after contextual information is gathered. Hanley explains that “evidence-based design is informing decisions, design decisions, throughout the life of the project. It’s not just in the beginning or at a particular bookended phase. It’s really throughout the point of the process – revealing itself throughout” (Hanley 2013). The design process is inherently a process of running into unforeseen issues that requires designers to rethink, throw out, and redo a lot of the research they had previously done. “It’s really not only [about] being able to reach out to the larger bits of information, but it’s constantly reassessing the role that information [has] in the project, to respond to all the factors that we typically respond to” (Graffam 2013). For instance, the owner runs out of money, soil conditions are not what they thought, infrastructure limitations arise, community changes its mind – “all these things that we rely on to provide the basis of what we’re doing. [Evidence] is not a one and done. It’s always evolving. And so the tools, again, that help us do this more quickly and reach out into the larger landscape of information, are really important” (Graffam 2013). Graffam reiterates that there is no one place to apply evidence; there are so many variables in this profession that lead to the final state that they may not even appear to be relevant until halfway through the project. This is why OLIN’s design process is insistent on critically evaluating the evidence over and over again as well as critically re-evaluating the role of research on the project (Graffam 2013).

Another iterative process in place at OLIN is the actual measurement of performance throughout the project. The process for measuring varies based on the goal being measured. Hanley explains that, “we very much want to measure the impact of our design as we’re developing it” (Hanley 2013). Just like there

are times during the design process set aside for quality assurance of document production, there is a time during all phases (SD, DD, and CD) where each of the Directors will schedule meetings with the project team to review problems that they are addressing. It is about “applying those critical thoughts throughout the process,” says Graffam (Graffam 2013).

As Director of Technology, Hanley is also insistent on making sure that design decisions made during the design process are purposeful. He uses the example of a paving pattern and worries about the overuse of some patterns because they are automatically generated; there is nothing influencing it, there is no evidence behind its use, there is no aesthetic quality beyond the fact that it is “pretty” (Hanley 2013). Hanley argues that instead, the reason to use certain patterns should be because you understand its faculty, its utility. You understand the material, the arrangement of the material, the structural integrity of the material, the aesthetic quality of the material. And you understand why you’re using it because these factors have been proven (Hanley 2013). Hanley says that “it’s [his] challenge in showing people not only the value of some of these digital tools that can be used to explore these patterns but then making them meaningful. Don’t just make the pattern because there’s a button that says ‘Pattern One’ and it looks cool. Okay, that’s all well and good but what else? How did you come to that pattern? What problems is it solving? What value is it adding to the design process? Show me the evidence” (Hanley 2013).

A particular phase of exploration that Hanley is particularly interested in is when it comes time to talk to the manufacturers or fabricators about the properties and fabrication of certain design elements. Part of Hanley’s job is making sure that the project team goes to the manufacturer with a high degree of information and a certain level of expertise about what they are asking the manufacturer to do (Hanley 2013). Hanley describes the process as “optimizing the value of the product” to avoid it being cut out or reduced in value during a Value Engineering (VE) process. “Let’s take a simple example of a bench or even a paving pattern – and [someone] says, ‘oh you can’t, it’s too many cuts’. Well we already actually have optimized this in such a way that not only are we achieving the aesthetic quality that we wanted but we’ve minimized waste. So waste went from 40% to 10% ... We can substantiate that with what we’ve done because it’s built into the process” (Hanley 2013). Informed and substantiated decision making at OLIN continues all the way through the design process and influences decisions even in construction and fabrication phases.

OLIN's process for applying existing evidence to the design process primarily involves 1) utilizing their Knowledge Base tool (further discussed in the Implementation and Components section) and 2) utilizing experts in related and unrelated fields (previously discussed in the Finding and Producing Evidence section). In addition to the application of existing evidence to inform design, OLIN is moving more and more towards producing its own studies, including post-occupancy studies. Hanley describes that "the area of interest now is also using some of those advanced technologies and tools to prove and gather evidence from [our] design decisions ... There's the input, how they influence design decisions and then there's the output, how did it result, did it do what we thought we were instructing it to?" (Hanley 2013). Hanley admits that the front end of the process, the application of existing evidence, is something OLIN is particularly good at, "the outcome is the newer horizon, the newer frontier that we're exploring" (Hanley 2013). As one of the leaders of these post-occupancy studies, Blumenthal acknowledges that "not a whole heck of a lot [is required for the firm to be able to do long term monitoring]. We would need the hardware to actually document how the place looks and performs overall ... Either boots on the ground to talk to the users and record observations or some kind of partnership with the academic or local community to do the same ... If you're asking the right questions, you can do it relatively easily" (Blumenthal 2013). These post-occupancy research agendas are usually identified in the initial research stage as something that the firm wants to evaluate after the fact. An example of a post-occupancy study currently underway is described by Blumenthal below.

A really full throttle post-occupancy evaluation we're doing right now is down at Canal Park in Washington D.C. That was a project we've been working on since 2009 that just opened in 2012. Since the spring, [Michael Miller, from the design staff] and I have been going down there to do surveys, record observations, do time lapse photography partially to fulfill some Sustainable Sites Initiative credits. They have a credit that's specifically for performance monitoring by going back and proving things set in the pre-design metrics ... We figure, in the process, we can kind of build a methodology for ourselves to do long term monitoring. I think that's a high priority of OLIN's is using that data to inform future design. We're focusing most of our efforts in fact on social credits that we were going after with SITES. Things like creating spaces for mental restoration and for social interaction because those seem like the ones that are really kind of more fuzzy. The methodology towards proving it, at least through SITES, is still

a little less rigorous, less quantitative. Whereas with the ecology restoration and the economic factors, we feel like we've got a pretty good handle on that. We're hoping that in this process we can get some scientific proof for things in the field that the design team already knows or that they think they know and maybe find some less intuitive things as well. So we're going to track how successful we were at that and how specifically design decisions contributed to that success ... Hopefully that becomes a sort of built-in service that we can do, this sort of long term monitoring if we get a kit of parts in place that helps us do it. (Blumenthal 2013)

In another project example, Hanley describes that a research plan was developed to help measure and quantify a number of metrics. By the end of the analysis however, there was no earth shattering revelation. "What it told us was that when we drew those lines of how we thought people were going to move, we were right" (Hanley 2013). It did not tell the design team anything that they did not already hypothesize. Hanley however describes what the benefit of going through this process meant to the firm:

But what came out of it was a process by which to collect that data and quantify it that was much faster than previous methods. Previous methods were things that we may have employed on Bryant Park where, with Holly Whyte, we went out and counted people. We'd go out and measure things that exist: pre and post. Now, we're harvesting the same information but with different methodologies. Twenty-five years ago it was a very analog process. Today, a very digital process. But still getting similar results. The challenge there is that, okay now we can do that, so what? Now what? ... To me, the next step is taking that information, applying it to the next project and using it in such a way that influences the next design decision, in this case movement and paths of travel. (Hanley 2013)

Making sure that research done on one project is useful on other projects is what makes the research initiative at OLIN profitable and efficient. Results from one research study are structured in a way that can be used as evidence in projects of the same project type. Graffam describes breaking information down into three scales: project specific, project-type or client-type specific, and profession-wide. "The first scale is really the project-focus scale which is like answering questions or understanding challenges on a project by project basis ... the goal there is to literally answer the question or to provide that context and then move forward

and complete the project” (Graffam 2013). The information gleaned from this level of study is documented in the Knowledge Base but it is really only relevant to that project only. The next scale up is more project-type challenges that could be arising across several similar projects in the office. “What we’re trying to do there is build on knowledge from lots of different projects and pull out salient themes that are continuing to either prove to be successful or [prove to be] challenges” (Graffam 2013). The goal is to create a basis of information on the Knowledge Base that is “helping to inform future projects of the same typology” (Graffam 2013). The third scale would be project types that not only involve OLIN’s particular clients but involve others in the profession in a bigger discussion. “This might be partnering with an academic institution to address larger issues; and we are a part and they are a part and we’re bringing lots of different people together that we would never normally need on a project but it’s providing you a bigger range of contacts” (Graffam 2013). The firm has had experience with partnering with others to do economic analysis, regional geography analysis, and involving urban environment interest groups, stakeholders, and experts to gather information (Graffam 2013). OLIN is able to make the research in design process productive by reusing information on projects within the same scale realm.

Implementation and Components

OLIN’s design process is not fundamentally different than the typical design process (see Figure 2.4) when it comes to delivering a high quality project on time and on budget – a design team will always require a certain amount of information and expertise to execute this. It is “the tools [however,] that make the insertion or the interaction with that information slightly different” (Graffam 2013). The internal components that support OLIN’s evidence-based design approach include an extensive digital repository called the Knowledge Base, a range of BIM and data analysis software, a discussion group called the Theoretical Basis Group, and an education series. All of these components help to support the implementation of evidence-base design directives and culture at the firm.

The Knowledge Base is an internal, searchable, digital database that houses much of OLIN’s library of information, literature, project performance, precedents, and lessons learned. The purpose for creating and developing the Knowledge Base, Graffam explains, is because “the difference between a five-person firm and an eighty-five person firm is you need the tools to help distribute that information more effectively” (Graffam 2013). The Knowledge Base is the place to quickly find information that is relevant and considered credible by OLIN. It was built and is currently overseen by Karl-Rainer Blumenthal who has a background in academic libraries.

One of the reasons that I was really turned on by this idea is [because] it's a search engine and kind of an encyclopedia without the problems of Google and Wikipedia which are too much information and information you can't trust ... For instance, when you're searching for green roofs in this repository instead of on Google, you're going to find stuff that spoke to us, either our own work or from projects outside of the office, the books that we know are authoritative on the subjects. You're not getting stuff by authors [you've] never heard of, anonymous authors, things that really are just perpetuating myths. (Blumenthal 2013)

The inspiration for the form of the Knowledge Base came from a mix of the Google or Bing search page – a simple, across the board site search. If a more fine-tuned search is required, the searcher can click on built-in tabs that can lead to areas focused on specific topics or specific types of media. These tabs include sections entitled Library, Projects, Research, Plant Finder, Sample Room, “OTV”, and Professional Practice. As of 2013, two years after its inception, the database houses 5,500 entries. The content of these entries is voluntarily developed by OLIN employees. Although Blumenthal was doing most of the work in the beginning, the firm has worked up to more and more contributors and more and more entries from the contributors daily. The opening page even has a live “news feed” showcasing what people around the office are posting. “I try to make the barrier to entry as low as possible so that people feel like it's easy to just add something ... I've been kind of easing off the gas when it comes to actually authoring content which I was doing a lot of at the beginning, and letting them take over that process and just coaching them through and editing what they add ... [Making sure it] gets tagged so it's a little bit easier to search, and it gets shelved in the right area in here so it's available for browsing or if people are on a related page they get to see it” (Blumenthal 2013). Blumenthal also notes that his heavy involvement in the beginning was due to the need to develop a tool that would have an impact right away. Although people saw the eventual value of the database if they continuously contributed, it was easier to get people on board when there was already useful content available to them. “From there,” Blumenthal explains, “they've really taken it on.”

The Library tab of the Knowledge Base operates just like a card catalogue of books at a university or public library. The OLIN library catalogue tracks physical books on their shelves, tells you how many books there are on that topic or by that author, and directs you to their locations on the shelves. The books have been extensively cataloged by Blumenthal and it is his goal to get everything in physical

form on the shelves onto the Knowledge Base so that teams reap the benefits of research that has already been done before and they do not have to start at square one every time (Blumenthal 2013).

The Projects tab contains information gathered from OLIN projects. It is organized chronologically starting with the earliest projects in the 1970s and includes the project that most recently came in the door. “The projects are ultimately what spurs all of [the] questions and [are] the hubs where all of the different topics [that are common to other projects] overlap” (Blumenthal 2013). Under any one project page you might find links to other projects, ideas, reports, or areas for further research that could be specific to this one project or a perennial issue on multiple projects (Blumenthal 2013). Content is (ideally) developed by the project team using the “vision data” that the associates develop for each project as part of the project management database. The vision data helps to generate a list of attributes that start to organize projects into certain typologies. Identifying issues and solutions across these typologies and documenting them happens when the individuals working on these projects (as part of a fixed process) physically sit down and talk about common challenges and possible solutions. Solutions are then documented in these project pages that might link to similar projects containing the same typology.

The Research tab contains existing literature and OLIN-led studies on specific topics. When doing a search on the main page, these references appear as well as links to precedent projects, images, OLIN projects, and cataloged books. For instance, when searching for ‘green roof’, a list of OLIN projects with green roof designs appear, potential precedents projects and their images show, a “news feed” type list of latest trends appears to quickly catch people up to speed on the latest research or discussion about green roofs. A simple explanation and a couple of illustrations are shown and a breakdown of modular green roof systems with their costs and performance statistics is easily within reach. Any of these subsequent pages can be modified and edited, many contain information from multiple sources, and every page has the ability to attach PDFs, Word documents, CAD files, Adobe Suite files, and photos. An example of a subject housed in the Research tab is the Black Locust which erupted in recognition and favorability within the profession as the perfect answer to tropical hardwoods. Much of the conversation that was happening in the studio and among the profession was summarized in the Research section of the Knowledge Base. Information on the tree include its harvested material properties, its best application, information about suppliers, a

description of how it weathers, and whether or not it's considered sustainable by LEED or FSC [Forest Stewardship Council] (Blumenthal 2013).

The Precedent section contains full of images of both design elements and full projects. Precedent images that have been used before on other projects to show clients or to share visions with the project team are stored here and everything is searchable. The precedent images help to visualize certain evidence-inspired design choices and help to address the aesthetic quality of projects that have implemented these elements.

The OTV section (presumably abbreviating OLIN television) holds video files of lessons from OLIN's education series that were video recorded and filed in the Knowledge Base for those who attended to reference, for those who could not attend the original presentation to watch, and for all future employees of OLIN to benefit from this knowledge. Topics like soil science, living systems, tree installations, and quick tutorials on software tricks are all examples of the type of video content searchable on the Knowledge Base.

The culture of contributing content to the Knowledge Base varies widely among employees. When asked who contributes the most, Blumenthal has a hard time pin pointing the characteristics of people most likely to contribute. Some may assume that those from the more digitally-savvy generation are likely to contribute more content. To some degree that is true. But Blumenthal gives the example that "the person who's really the most adamant about having the material on here so he can access it from his iPad in meetings all the time is forty years older than the next most frequent contributor" (Blumenthal 2013). There are some designers that come from the more traditional approach to design who are not as comfortable authoring content themselves but will email conference notes and interesting articles to Blumenthal who is then happy to add the content to the Knowledge Base (Blumenthal 2013). Another variable that seems to be determining high-volume contributors is how long they have worked at OLIN. For instance, people who joined the firm six months ago tend to be more regular contributors than those who have been at the firm for ten years. "Not as a rule but they kind of dive in faster because they understand, like everyone does, the ultimate promise of [the Knowledge Base] and they haven't been trained into a workflow process of which this was not a part" (Blumenthal 2013). Blumenthal explains that at first, contributing content to the Knowledge Base seemed like an intrusion on the process that people had gotten used to – it seemed like an extra step. But the

goal was to have the tool replace other non-efficient steps in the process so that it proved to be valuable to the designers. Since the Knowledge Base demonstrated this to be true, Blumenthal has seen a decrease in the amount of encouragement needed from his side. Just as valuable as volume of content is to the building of the Knowledge Base, Blumenthal explains, is the quality and timeliness of information – “if it’s the right thing at the right time, [then] it’s not really comparable in terms of volume” (Blumenthal 2013). Blumenthal explains a situation where the information added to and gleaned from Knowledge Base can benefit several projects and project teams:

The other day we had someone say, "hey you know, I've never created a bocce court before; has anyone else?" And they all said "oh yeah!" So we found out which projects, we got a great list of precedents, one description of what you kind of need to know about the sport to get started and some very basic plans and sections that start you off on your way. That would be ideal if someone, you know, six weeks from now says, "shoot I don't know how to make a bocce court." They might not have even been around for that conversation; they can jump in here [to the Knowledge Base] and find it and make something of their own and add it to the process and it keeps building. (Blumenthal 2013)

Holistically, the Knowledge Base is the repository of information at OLIN that allows accessibility to evidence to inform design decisions. Other forms of software are helping OLIN to analyze data and apply findings efficiently. The first of this example is a Google product called Fusion Tables. It is a data visualization web application that allows the user to visualize two or more data tables in one. An example of Fusion Tables’ use at OLIN came when a design team was looking at two different wood alternatives for a bench application. Tropical hardwoods, synthetic woods, and domestic options were all compared across the board in terms of different material properties, sustainability, and long-term value. The team was able to make an informed decision based on those properties and the visualization that resulted from the Fusion Tables comparison was published to the Knowledge Base for future use.

The 3D BIM software, Rhino and its parametric plug-in, Grasshopper, are used at OLIN (in addition to their standard production tools) to make design concepts a reality. Recalling the paving pattern example, it is one hurdle to define the properties of paving to come to a conclusion that certain paving

patterns occur in certain locations, it is another hurdle to “incorporate those influences into meaningful design decisions” (Hanley 2013). For example, Hanley was evaluating pedestrian movement patterns on a site and wanted that to influence paving patterns. With parametric modeling, he was able to load the data about pedestrian flows into the software and intelligently apply parametric paving patterns that now influence pedestrian movement (Hanley 2013). “What makes it beautiful and meaningful is how much I bring into it – of influencing why it’s doing it, not just make the wavy pattern ... the value that it adds to the design is not necessarily your mastery of this particular tool; it’s how you choose to let it influence or be influenced” (Hanley 2013). BIM technology is also allowing teams to look at different production methods in order to yield the most cost-effective and least-materials-wasted products. Graffam gives a scenario of a custom bench design: “you have a bench, here’s the design of it, I can cut it this way [and] it’s going to yield x pieces of granite. Here are several others ways to cut it that are more efficient. [Through] that analysis, the design looks exactly the same but the fabrication of it has been enhanced greatly by the efficiency of that analysis” (Graffam 2013). These evidence-based technological design processes allow the designers to maintain greater control over the design because they have the tools to truly understand design fabrication and give alternatives in the event that budget will not allow for their initial design concepts.

Moving from the technological supporting components of OLIN’s evidence-based design approach to the more human-centered initiatives, OLIN has implemented both an education series and its Theoretical Basis Group. The emphasis on continuing education at OLIN no doubt comes from its founders’ academic origins and its continued involvement in academia. Individuals with similar interests started to form groups around topics and began presenting and sharing information in the form of lunch-n-learns and lecture series. For instance, Steve Benz, a civil engineer by trade, who moved to the firm in 2011 and became the Director of Green Infrastructure, began lecturing every couple of weeks over lunch about infrastructure. He speaks to his experience and issues surrounding grey infrastructure and relates it to green infrastructure. This has taught common vocabulary between two very different systems and enables the designers to better communicate their intentions with civil engineers (Blumenthal 2013).

The other initiative, the Theoretical Basis Group, brings everyone from interns to the most senior partners of the firm together to discuss the things that influence

their designs and why they are important. “We have it once a month; it’s in the evening after our monthly board meetings (which include all of the partners and board members). And we have it at the night so that we know all of us as senior folks are going to be in the office, physically in the office ... it provides an opportunity for us to interact very personally and intimately with folks in the studio we may not have the opportunity to talk to on a regular basis. And we have critical discourse about why are we doing what we do. What are the things that influence our design?” (Hanley 2013). This group does not tend to discuss scientific evidence but rather theoretical evidence – trends in society and culture that influence design. “Are the things that were relevant fifteen years ago, twenty years ago, thirty years ago, still relevant today?” (Hanley 2013). The idea for the Theoretical Basis Group was suggested by some of the younger staff members who wanted a better understanding of why they were doing some of the things asked of them. The firm leaders did not want the younger staff to feel as if things were being dictated to them so they created the group as a vehicle for conversation in order to “re-institute that level of discourse that used to happen around the table when [the firm] was a smaller group” (Hanley 2013). Hanley explains that setting up the mechanism for the group to be successful was actually pretty involved but the idea was growing the culture of the firm and he agrees that it has been successful thus far (Hanley 2013).

Whether human-centered discussion groups or extensive digital databases, the supporting components of OLIN’s evidence-based design approach have helped to achieve their EBD goals as a firm. The Knowledge Base, BIM tools, the education series, and the Theoretical Basis Group each have contributed to designers’ understanding of the process and have increased the efficiency of research-in-design efforts drastically.

Firm Organization

The most prevalent change to OLIN’s firm structure, in order to better accommodate research and evidence-based design, is the formation of the Directorship. There are currently three Directors: Chris Hanley, the Director of Technology, Skip Graffam, the Director of Research, and Steve Benz, the Director of Green Infrastructure. It is important to note that each of the Directors is not exclusively that; they each have their own project work in addition to their director roles. The fundamental responsibility of each of the Directors is to “help focus what’s important and what isn’t; what areas of evidence continue to be relevant to our design process” (Hanley 2013). For instance, Hanley’s role as Director of Technology is filtering through all of the different vehicles and

mechanisms for harvesting evidence that has the possibility of influencing design (Hanley 2013). Graffam's role is to ensure that project teams are infusing research methods in appropriate way throughout the design process and make sure they have the resources available to them. Benz has a long history in the engineering world and is on the technical advisory committee for both LEED and SITES. He is therefore able to lend a lot of expertise, resources he knows about, and can test an array of innovative design solutions. "Steve meets with every project to make sure that those opportunities are being evaluated where they're available and they're not." (Hanley 2013).

Graffam and Hanley make a point to say that the way in which the design teams utilize the Directors is intended to be designer initiated. "It's led by the project team because [the firm is] really trying to infuse research throughout the process [and this is done so the process] doesn't get held up or log-jammed by [the Directors] needing to be there" The individual or team will decide which areas they want to delve further into and then approach one or more of the Directors for guidance. Graffam explains that "it's a facilitation. It's bringing in the expertise and getting the resources like Karl and so forth. We're really about facilitating the project teams doing their research and helping them to do that ... And afterwards, it's [determining] how we share that. So it's knowledge-based, it's articles, it's presentations, it's conversations in studio" (Graffam 2013). These are the directives in making the Directorship at OLIN instructional and supportive.

The research department (Graffam included) and its research librarian, Blumenthal, are also relatively new additions to the firm's organization. Blumenthal is the only full-time researcher and the firm does not have the luxury of having a large research department (Graffam 2013). Graffam describes Blumenthal as "kind of like the über-facilitator ... the idea is that he's helping [the teams] with his expertise in terms of knowledge management and his background in resource management to help the teams answer their immediate questions" (Graffam 2013). The research group is described by Graffam as the "principle investigators" who work with the project team so that neither party is expected to facilitate an entire research endeavor. Blumenthal and Graffam are then inserted into multiple projects through the research members on the project teams to help pull out some of the big topics and provide guidance in the research process. Project teams that do a lot of their own research are also more profitable for the firm because they are doing research in conjunction with billable projects rather than research as pure overhead. Hanley alludes that other firms may have research

arms that are partially funded through alternate revenue streams in order to seek other ways to make research at firms (Hanley 2013).

In OLIN's case, where the individual designer is not expected to be the expert on everything, project teams reach out to different sources of expertise both within the firm and outside. Teams may require specialized expertise in either scholarly or technical areas at certain points in the project to improve the design process "which saves everybody having to be an expert in everything" (Graffam 2013). This affects the team make-up because the supporting "experts" are integral to the team in that they carry much of the workload that used to be required of the designers. "So now instead of a landscape architect spending a large amount of time on harvesting, they can spend a focused amount of time deciding what needs to be harvested and request that of a person or a resource that's available to them" (Hanley 2013). "[The firm] has added people that will support the projects in ways we didn't have before" (Graffam 2013).

Design Culture

The design culture at OLIN that supports the evidence-based design approach is one of investment and diversity. From principals to designers, everyone is dedicated to a level of rigor to support OLIN's EBD approach. The designers invest a lot of time and passion towards this ideal as well as the firm investing financially. "We value that research and the evidence that [it] ultimately will provide us. We have reached into our own internal pockets to help offload some of that cost" (Hanley 2013).

The EBD approach is also one that is innate to the designers that work at OLIN. As the approach has evolved, the level of rigor has increased. Although the Directorship was born to handle some of this rigor, there is still a common desire – directed by the designers – to go through a research and investigation process anyway. Hanley says, "it's not like if I wasn't involved [as a Director], that wouldn't happen – there's that desire" (Hanley 2013). It is also common that everybody has a different kind of approach to the EBD process depending on their role in the office and among the partners. This contributes to the sense of diversity in the firm, allowing for dynamic project solutions and a constant dialogue of different perspectives. Hanley says, "I think that's where we have been very fortunate to have access to really smart people and it's why I loved Theoretical Basis group, hearing what they're saying; it's why I love the amount of partners that we have" (Hanley 2013).

The conversation style between designers and design teams has also evolved with the development of the EBD approach.

It used to be, if I'm one of the founding partners, my team is around this table and we're drawing together. So the evidence, the rationale, all of the research that I'm thinking about is being talked about right here. So a clear line of communication ... As we've grown, those conventional meetings around the table certainly still happen, but they may not happen quite as frequently. Because they are so important, we have embraced various mechanisms, both technological and culturally, to make sure that the continuum of design dialog is maintained for the entire team. (Hanley 2013)

Besides the changes to level of rigor and style of communication, the design culture at OLIN has remained similar to what it has always been: a self-motivating group of people invested in the research and design processes.

APPLICATION

Clients and Client Relations

OLIN has experienced a client-designer relationship shift that has occurred around the profession. The first change being that clients are increasingly expecting to see proof that their projects are or will perform (and by how much). "Clients have evolved in expectations particularly around landscape performance ... They're still not to the level that we think of in terms of what [the landscape] is capable of but it's a long rise in terms of sustainability from where they were fifteen to twenty years ago" (Graffam 2013). When these clients are looking for performance or to meet requirements, they look for a project team that will produce a design as well as internally do the research for it as a built-in process. Blumenthal foresees that "if we start from a position of clients having an interest in longer term performance metrics for their projects (which one would have to assume from things like Sustainable SITES and the LAF case studies and all those things that clients are invested in), yeah I think if you can hire the landscape architect up front to build that into their scope of services, it'd be great" (Blumenthal 2013). Blumenthal also says that this is an attractive service for their public clients like municipalities, Department of Parks and Recreation, and Department of Transit, who do not always have the means to do research and evaluations themselves (Blumenthal 2013). Graffam also says that with the rise in expectations from clients comes the taming of client expectations as well; "I think there is some expectation of the ability to tap into things that the clients may not be aware of what they're asking for" (Graffam 2013).

The second aspect to the change in client-designer relationship is the availability and increase in information sharing. Clients are actively seeking out firms

that provide evidence-based design services because they are hearing about its potential from others or they read reports in magazines or blogs. Graffam even explains that municipalities (one of the main sources of the firm's projects) will search the internet and see what other cities are doing: do they have a Complete Streets manual, do they have design standards? They are able to find "information that was previously only available to a select few but is becoming more available to a larger audience" (Hanley 2013). More clients and firms are publishing their performance outcomes and therefore the information is more readily available for other clients to see and expect the same. Clients might also be seeking out EBD because it is part of the expectation to achieve SITES and LEED. It is also common that the agency or governing body reviewing the clients is demanding performance measurements (Graffam 2013).

OLIN is seeing that if the clients are not seeking out EBD, they are at least more willing to hear an argument for why it might be beneficial to them. Graffam describes that "in many cases we were the ones pushing a sustainable approach. There seems to be less pushing of that now; they're much more willing to listen to it or at least understand that" (Graffam 2013). Graffam also states that the easiest way to convince a client to engage is research and evidence gathering is quantify the benefit and relate it to their budget or expected outcomes.

Overall, Hanley has not noticed a drastic change in clients since developing OLIN's EBD approach, but Graffam adds that he believes the EBD conversation has entered where it was not before (Hanley 2013; Graffam 2013).

Types of Projects

The types of projects that OLIN's evidence-based design approach lends itself best to is described by Hanley and Graffam as ones with innate complexity – "we've never met a project that [could] be less complicated" (Graffam 2013). When a project is so complex that it is difficult for any one person or any one team to be experts in every issue that the project has to address, the team must turn to outside resources or experts to influence design decisions. OLIN uses BIM software as a way to organize, track, and distribute a significant depth of information on complex systems within a project. For instance, "Canal Park is a more recent one where you literally look at the Revit model and what's underneath it – it's just mind boggling. The coordination of geothermal wells and structural piers and stormwater reclamation and filtering and so forth" (Graffam 2013). Complex projects, Graffam notes, is something OLIN has specialized in since its founding – its history is closely tied with the firm's historical practice of evidence-based design.

The scalable nature of OLIN's evidence-based design approach is also important to the types of projects it receives. With a firm the size of OLIN, methods, tools, and resources need to scale appropriately to meet the needs of a wide range of projects to optimize the tools' uses and efficiencies. The relatively loose nature of the application of evidence-based design allows teams to vary the level of applicable research based on the project's needs. Graffam explains that "at the end of the day you have to deliver a high quality project in a certain amount of time and you need certain expertise depending on the type of project. So there are always some similarities whether you're a two person office or an eighty-five person office of needing that information and needing it at the right time" (Graffam 2013).

There are also projects coming into OLIN that inherently start with certain expectations: "Today we are seeing projects that need to meet a certain set of requirements that are measurable, that can be proven and qualitative" (Hanley 2013). Hanley describes a shift in client expectations that is more performance-based that is was in past decades. These clients and the projects they bring to the firm are inherently cut out for an evidence-based design process where performance measurement and benchmarking are at the core. Hanley also notes that "with changing economic times, designers across disciplines are being stretched a lot further on less contracted time" (Hanley 2013). This expectation requires efficiency and accuracy on the designer's part – variables that can be optimized with an evidence-based design approach eliminate rework and designing from false assumptions.

One commonality among projects at OLIN is that research coincides with billable work – an applied research approach rather than a basic or academic approach. Graffam explains, "we currently don't have the luxury of having a large research department. We have to do this in conjunction with our projects" (Graffam 2013). Thus the types of projects OLIN pursues become the types of research inquiries pursued and the types of research define the type of work for which the firm competes.

Consultants and Consultant Relations

OLIN believes that, to have an effective evidence-design approach, consultants need to be integral to the collaborative team. Graffam recognizes that when designers interface with engineers, ecologists, or builders, "evidence is the universal language" (Graffam 2013). Often, Graffam says, designers can be very subjective and their intent can get lost – "evidence is that common language that yields more accurate results and better collaboration" (Graffam 2013). Therefore,

consultants working with OLIN are plugged in from the very beginning of the project rather than being brought in when specific questions arise. Consulting at the end, Graffam says, often leads to unwanted compromises because something has to change in the design – and can ultimately lead to an ineloquent product (Graffam 2013).

In the evidence-base design process, consultants can oftentimes be the expert voice and the design team must weigh their own points of view with the views of the ecologist or the engineer’s point of view (Graffam 2013). “[The designer] has a body of knowledge, [the consultants] have a body of knowledge, and the two come together ... [the team is] incorporating components that [the consultants] feel are important or critical” (Graffam 2013). As clients are increasingly in the market for fast-paced schedules, designers do not have the luxury to learn things from scratch and become an expert in everything – “they have to be able to be fast – learning from others and building others into the project” (Graffam 2013).

Graffam recognizes that, more than ever before, designers are able to tap into more fields for information – for evidence. “We are able to tap because of the ability to either talk in the same language or convey information that is of similar units or qualities. We can actually engage the thought process of other disciplines in our work which we couldn’t do before” (Graffam 2013). This opens OLIN up to a much more integrated design approach with consultants and their breadth of knowledge. “There’s a much wider range of potential collaboration and expertise to tap than we had before” (Graffam 2013).

Marketing

OLIN is finding itself at the cusp of implementing evidence-based work in the design practices. Designers may have been practicing it for years but “there’s becoming more of a marketplace requirement for this level of accuracy of information or accountability of information” (Graffam 2013). As more and more clients are seeking out this level of performance, OLIN has altered the way they market themselves for work. Graffam believes OLIN is ahead of the pack in being able to offer this kind of service to clients, but he says “it may be not so long down the road that they are requiring it” (Graffam 2013).

The Directorship is a major aspect of the firm’s ability to market themselves as an evidence-based and research-focused design firm. Being able to talk to other disciplines and show what landscape architects are capable of, with respect to the Directors’ expertise, is one way OLIN earns project contracts (Graffam 2013). The

Directors are a physical representation of the knowledge and practices that go on at OLIN and potential clients often respond more positively to a tangible person that represents the process and ideas. It also shows the commitment OLIN has in investing itself in the research world when research is marketed not only through words on a page but through the actual manifestation of specialists at the firm. What the Directors (and their project teams) produce can then be turned around and shared with others in the field to increase market share.

It is important to note that OLIN's marketing brochures are largely devoid of mentions of research, evidence, and/or evidence-based design. Phrases used in one generic marketing brochure *could* be interpreted as having an underlying EBD tone: "basing design decisions upon the underlying expressive power of a particular site in conjunction with specific programmatic requirements" (OLIN n.d.). OLIN's website however has a tab dedicated to research which houses a few employee-authored articles which tend to be reflections on current work or others' research rather than the firm's own published research. The firm markets itself as being well-informed and critical, and the website's research tab acknowledges and markets this research interest to potential OLIN clients.

PROPAGATION

Reporting

OLIN's research culture strongly supports the sharing of knowledge with others – likely a result of their academic roots. There are occasional concerns about the confidentiality nature of their research and findings from their clients as well as proprietary concerns when it comes to OLIN's own work and process. Ultimately however, Graffam says, "we want to give the information we can give to others to help the profession because it's better for everybody in the long run ... just because of the love of the art and craft and the role we feel we play in the shaping of the built environment" (Graffam 2013). Sharing lessons learned, research methodologies, and findings benefits other designers in the profession by continuously building on existing knowledge. Graffam also points out that, "the more people saying the same thing to clients and regulators, the better it is for everybody" – meaning that the repeated presentation of supporting research eventually becomes a best-practice and even a common practice to leverage (Graffam 2013). Reporting and presenting therefore comes easily to those at OLIN who strive to see their work serve not only the primary beneficiary, the clients and users; but the field, second; and their own interests ultimately.

The ways in which OLIN most often reports research, findings, or lessons learned is through posts on their website, white papers, conference lectures, and trade magazine articles (Graffam 2013). Examples of forums in which OLIN employees have presented include:

- International Federation of Landscape Architects (IFLA) World Congress
- American Society of Landscape Architects (ASLA) Annual Meeting and Expo
- Landscape Architecture Foundation (LAF)'s Landscape Performance webinar series
- The Cultural Landscape Foundation (TCLF) interviews/webinars

Examples of where OLIN and its employees have published are:

- Landscape Architecture Magazine
- OLIN's own Reframe, a digital magazine exploring the complex and evolving issues facing cities and environments

Graffam and Hanley both talk about the sensitivity in disclosing information gleaned from research endeavors. Sometimes it is the client who does not want information shared with the public that could potentially hurt their own bottom line or marketability. Other times, OLIN will not want to share proprietary products like software coding, libraries, or drawings (Graffam 2013). As far as their process, OLIN has built a structure of practice that reflects the value they place on evidence which is not proprietary, like theory is. OLIN also recognizes that designs – once built – are there for the public to see. “(Users) may not know that it’s four or six inches of depth of concrete so you can drive on it; this is not like great state secrets or anything” (Graffam 2013). The advantage of landscape architecture is that a designer cannot just take everything done on one project and duplicate it on another; they may be able to take bits and pieces but landscape architecture – being a design that is set in a specific and unique context – cannot be duplicated. Graffam points out that the product of landscape architecture is inherently protected intellectual property and that, instead, addressing and reporting common issues in the field reaches the broadest audience. Graffam explains, “we tend to be more about answering common problems we know that are out there and answering them in a way that is helpful to the profession but not compromising that uniqueness of each project ... We are all in this together because we care deeply about people and the environment. And so do the firms we compete with” (Graffam 2013). Designers are used to pulling out information from others’ projects where digging up clients’ assets are not necessary

to complete the big picture. “There are many ways to distribute information that don’t in any way impact the kind of confidentiality or the security of our client relationships ... we’re very respectful of our clients ... and sometimes it is great PR for them – no problem we’re happy to talk [the project] up” (Graffam 2013).

Another aspect of self-reporting at OLIN reaches beyond the profession. Hanley says “I think one of the other areas in which we share those findings and add value to the field is speaking to groups that are not just landscape architects ... we’ve found that there’s additional value in speaking beyond the choir” (Hanley 2013). Steve Benz, the Director of Green Infrastructure, for example has a series of lectures that he offers for AIA credits. “That becomes a vehicle for us to get our message in front of architects to not only teach them some of these tenants that we have always held dear: green infrastructure, ecology, why it’s important to play with the design. But also that if you need help with it, we’re really good at it” (Hanley 2013). Using that universal language of evidence gives more credibility to landscape architects when they speak beyond their discipline. Both Hanley and Graffam say that this type of reporting is most successful when they hear these comments coming from the other side of the table: “I didn’t know you guys did that; ‘I didn’t know you guys knew that; ‘I didn’t know landscape architects even dealt with that; ‘I didn’t know you guys even thought about those things.” (Graffam 2013; Hanley 2013). Just as clients needing to hear the same evidence over and over for it to make an impact, constantly sharing landscape architecture’s capabilities outside the profession helps our credibility. “It’s sort of flying the flag of landscape architecture and the value that it adds as a discipline to those that may not fully understand what landscape architects do holistically” (Hanley 2013).

Collaboration and Outreach

OLIN most commonly collaborates with academia in their evidence-based design approach. Interacting with students and faculty is a real core value of theirs – very much part of their ethos (Graffam 2013). “[Graffam’s] personal interest is encouraging a relationship and conversation between practitioners and academics about research. [He] thinks there is absolutely room for highly specialized practitioner research and highly theoretical academic research, and they don’t necessarily have to overlap everywhere” (Graffam 2013). As the Director of Research, Graffam has studied the interrelationship of researcher and practitioner. He suggests that there are two very different definitions of research between academics and practitioners. There are also two reward structures for doing research between academics and practitioners. Academics likely do not get tenured for applied, quasi-experimental research and practitioners are not

profitable if their generated research does not solve a practical, project-related problem. “Academics tend to dive very deep into single topics and don’t see how they necessarily relate to others. Practitioners are all about the interrelationship of things, so they typically go very shallow and wide in terms of what it impacts” (Graffam 2013). The benefits from an academic partner include having more time to dive into detail, access to libraries, and they typically have contacts across multiple universities and disciplines. Practitioners can offer their wide range of contacts, experience in built projects, and access to capital. Graffam is always in search of the platform to have that dialogue and find the point of mutual interest and benefit. Graffam explains: “I think in terms of the evidence – in order to facilitate that communication – you have to have that common ground. And scholarship and research is usually the common ground between those two points of view” (Graffam 2013).

Another avenue through which OLIN lends their evidence-based design expertise is through civic engagement; specifically, participating in the Mayors’ Institute on City Design (MICD). It is a multiple-day charrette funded by the National Endowment for the Arts. Eight to ten mayors from cities all over the country come and present design or planning problems to a panel of designers, engineers, academics, and other disciplines (Graffam 2013). “The [panel] basically noodles on it for two days and then they solve it or they provide a response” (Graffam 2013). Graffam attended in 2009 as a panelist for a small-scale western cities version. Bringing those that need the services together with a wide range of those that have the expertise is practicing evidence-based design on a fast-paced scale. OLIN designers learn from this experience and can bring the knowledge of other collaborators back to the firm. Tapping into the collective experience and knowledge of the profession (regardless of them being competitors), helps to solve real problems (Hanley 2013).

Future Trends, Goals, and Fine-Tuning

In efforts to improve and expand the EBD approach at OLIN, Graffam, Hanley, and Blumenthal each identified areas they see as priority opportunities for growth. These areas include expanding the Knowledge Base, developing a non-profit sector of the firm, growing the firm’s expertise and credibility, better understanding evidence, improving data management, and increasing academic collaboration. Beyond the firm, the Graffam and Hanley see changes to and opportunities for the profession including expected performance, collaboration amongst firms, creating stronger national organizations, open sourcing tools, tapping into unrelated fields, and adapting to cultural shifts.

As the firm's research librarian, Blumenthal has a particular interest in expanding the resources in and the benefit of the Knowledge Base. Blumenthal thinks the data stored in the Knowledge Base could be linked, as metadata, into modeling software like LandFX to create more BIM capabilities; "then someone doesn't even have to move away from the program they're working with to pull up information" (Blumenthal 2013). He is also slowly working on capturing much of the experience and expertise held within the long-practicing partners. Blumenthal explains in jest, "my hope is that someday we're going to seclude [Dennis McGlade] and Laurie in a room and say 'start typing ... tell us everything you know.' In the meantime, you kind of have to work with them to get it in there" (Blumenthal 2013). Graffam is already impressed with how the Knowledge Base has evolved because OLIN is even starting to use its own documented projects as evidence. On the other hand, Graffam would like to see an increase in the Knowledge Base's flexibility so that its growth does not always have to be tied to billable projects.

This idea of flexibility in the Knowledge Base stems from Graffam's vision to start a non-profit sector of the firm. This would allow OLIN to apply for and receive grant funding to support components like the Knowledge Base and direct some efforts towards more basic research rather than the applied research that is expected with billable projects. "It would be freeing us up a little bit more to really go to town and expand" (Graffam 2013).

Graffam would also like to see the profession as a whole, OLIN being one that would set a good example, grow in expertise and credibility. He laments that there is a huge middle ground that landscape architects are giving up to others like architects and biologists; the landscape architects *should* be working harder to be comparable as experts in their own right (Graffam 2013). In order to do so, Hanley explains that designers have to better understand evidence and its relevance to design: "it's really our responsibility to not only take the evidence into consideration but to have a deeper understanding of it, to really study and understand its relevance and how it's influencing our design, why it should be influencing our design" (Hanley 2013). Better understanding the evidence is one piece, but overall the need to better manage the data at hand will need to be one of the first steps toward progress. Addressing these issues will better position landscape architecture as a required role and landscape architects as expert consultants.

As previously discussed, Graffam is a consistent and strong advocate for academic collaboration both within the firm and within the profession. He says he "would

love to be able to attract academics to collaborate with OLIN more often” (Graffam 2013). He believes the Knowledge Base in particular will be of interest to academics as it continues to expand to the point where they might be actively seeking out OLIN to collaborate with. “It would be very interesting to develop some of those shared, mutually beneficial projects in a way that kind of allows us to live beyond just the project schedule” (Graffam 2013).

As for the future of the profession, Graffam and Hanley recognize some prevalent trends and opportunities. For one, OLIN is already expecting project performance to become a requirement and almost a calling card. Graffam elaborates, “I could see that being a question five or ten years from now from a [municipal client] saying, ‘show me your data, show me your performance data’ ... There could be a future not too long down the road where we have to submit not only our resumes and our project examples but we have to submit our project performance in some ways in terms of stormwater gathered, CO₂ captured, runoff quality improved” (Graffam 2013). Graffam appreciates the level of accuracy and accountability of information that this would require across the profession but also warns that this expectation could ignore a lot of the work that got to that performance data; it could oversimplify the process in the client’s eye to the point where it looks easy (Graffam 2013).

Hanley foresees a resurgence of cross-firm collaboration happening in the profession. He shares his perspective that many studios were born from a utopian vision and that they democratically shared amongst each other but then later evolved into singular institutions competing against each other. “I actually think that you’re going to start to see a swing back the other way. I think there’s going to be an opportunity for, yes we all have to make money and we all get paid for the services we deliver but I think there’s going to be more of those collaborative opportunities based on how you approach a problem and the evidence that you can generate to support that design” (Hanley 2013). Firms, Hanley says, will emerge as experts and will be called upon by other firms for that expertise in a mutually respectful way to move the profession forward (Hanley 2013).

Collaboration in general between firms, academics, and organizations is a trend that OLIN strongly supports. Graffam in particular hopes to see stronger national organizations. He suggests that the National Academy of Environmental Design (conceived in 2012) might become the equivalent to the National Academy of Sciences. Currently, landscape architecture as well as the other design and construction disciplines do not have that kind of established tradition. An

organization like that could bring together the academic, the practitioner, the consultant, and the contractor in a cross-disciplinary dialogue that has yet to become the norm for the allied professions.

Along the lines of open communication and collaborative transparency is the idea of open-sourcing tools to benefit the profession. Blumenthal envisions the Knowledge Base being taken over by a national organization and making it publicly available. This would benefit those smaller firms who cannot afford the libraries and databases that an institution may have. OLIN sees open-sourcing as a trend that will continue to take shape and provide opportunities for both the contributors and the benefactors.

OLIN has increasingly sought out seemingly unrelated professions as sources of information and fabrication consulting. Hanley and Graffam hope that this continues to grow in frequency at the firm and that the profession might adapt these practices as well. It starts, Hanley believes, with landscape architects sharing their own experiences and evidence beyond the field so that other professions may draw on landscape architects' knowledge to inform their own processes. Graffam and Hanley have read about and touted a few examples of this happening across other professions. One example is an engineering company, knowledgeable in demolition blast radii, who engineered a system for military ships to undergo shockwave testing right in the harbor instead of sailing out to remote parts of the sea and detonating tons of explosives, as was previously the accepted practice, and which ultimately scarred much of the marine ecology (Hanley 2013). Another example is an architect, James Carpenter out of New York, whose design of a building façade with intricate light installations was deemed unbuildable by the contractor. He thought, "who knows more about the cutting and shaping of metals?" So he got in touch with a diesel locomotive fabricator who confidently responded that this would be no problem for them and their machines to fabricate (Graffam 2013). The last example given by Hanley is Skylar Tibbits who graduated with an architecture degree and also is a talented coder and designer. His analysis of how certain shapes assembled helped a medical research team identify how certain harmful cells assembled, helped them explore strategies to interrupt that detrimental assembly process, and potentially cure a particular cellular disease. Hanley explains, "there's this area of investigative research that is happening based on two seemingly unrelated disciplines bringing their skill sets together" (Hanley 2013). OLIN believes that landscape architects have the opportunity to leverage their knowledge in

seemingly unrelated disciplines in new ways and are poised to be important voices in these cross-discipline collaborations (Hanley 2013).

One cultural element that OLIN sees affecting the future of landscape architecture, and really all design professions, is the cell phone. Rapidly changing culture requires rapidly adapting designs. Hanley explains that cell phones are now both a phone and a repository for infinite pieces of information and it has changed how we interact with each other, how we learn, and how we operate. Hanley says, “we're entering into sort of the apex of the data influx and we must understand how that changes design and the design process ... How do you respond as a designer to these cultural changes and [decide] what's important?” (Hanley 2013).

OLIN is one to pose many questions in regards to how they see the profession evolving. They are also determined to lead by example and are willing to experiment with these concepts in order to further the profession and the impact landscape architects know they can have.

Cross-Case Analysis

Introduction The following cross-case analysis compares each of the four firms' case studies to identify themes and uniquenesses. The cross-case analysis is organized using the same case study framework found in the individual case studies. Each firms' characteristic features are summarized in each subcategory and then an examination of likenesses, differences, and relativity is discussed using several spectra of characteristics. For instance, if an aspect of all four firms can be described using a common characteristic, they are discussed relatively as part of a "spectrum". A summary of these findings and diagrammatic spectra can be found in the cross-case analysis matrix, Figures 4.11.1-4 on pages 194-201.

NATURE + EMERGENCE

EBD Approach

The four firms of Design Workshop, Mithun, Sasaki Associates, and OLIN are considered leaders in evidence-based landscape architecture, yet each has a distinct approach to evidence-based design processes, implementation of EBD, and research.

One characteristic by which to compare the firms' EBD approaches is by formality; meaning how clearly defined, purposeful, and coordinated the approach is. The formality of each firm's EBD strategy varies. On one end of the spectrum, Design Workshop has implemented a clearly defined, structured investigation and sequenced approach to using evidence by setting up an agenda for projects early on and defining each stage of the process. This allows Design Workshop's approach to be efficient and replicable. Mithun's approach is less formal than Design Workshop's but still has a sense of formality in that there is heavy reliance on certification and rating systems to identify EBD opportunities. The question of what system is used, when, and to what degree is not formalized but is decided on a project-by-project basis. The formality of Sasaki's approach comes from the use of investigative software to collect, analyze, and visualize large amounts of complex data. These tools are non-static frameworks for design decision-making and alternative scenario modeling, making for an efficient process because of the tools' multiple uses (collection, synthesis, analysis, visualization of data, and on-going scenario modeling). The tools themselves are formal in that projects of similar types will use similar tools. The tool works the same way (although scalable) on each project, and the types of answers gleaned are typically the same. On the other end of the spectrum, OLIN employs a pragmatic application of existing and produced evidence in an overarching goal to make concepts a reality. Evidence-based design at OLIN is embedded, implied, yet not articulated – like in any kind of checklist – and thus is quite informal compared to the other three cases.

The four cases also differ in how their approach is active (where an EBD process is typically used to generate concepts) or reactive (where an EBD process is typically used to answer a question). Design Workshop's approach is very active in that they have a structured process to identify measurable goals and outline accountability. These goals are documented in the Sustainability Matrix to evaluate design alternatives and measure project success. The firm's use of a project dilemma and thesis could be considered reactive but the fact that they set themselves up to identify these pieces early suggests an active approach. Sasaki's approach is more reactive than active because the use of the Suite of Tools is incidental to the approach – the tools answer a certain line of inquiry. In some cases however, the use of the tools is active and inductive because the layering and gathering of any number of data sets could allude to an issue not yet recognized by the design team. The data generated by the design process can also feed back into the loop – an active application. OLIN's process is very reactive as they search for answers to pragmatic issues yet their supporting components like the Knowledge Base and Directorship are active because that knowledge, evidence, and expertise is available and produced whether there is a question requiring that information or not. Mithun's approach is more reactive than active in that evidence is considered based on the requirement outlined in a rating/certification system. A rating system, while creating a known platform for everyone to work towards and be accountable for, will often be used as a defense technique to protect certain design implementations that meet the certification criteria.

Finding and Producing Evidence

The four firms differ widely in the types of evidence they use and, if original, how it is produced. They vary based on the scales: qualitative vs quantitative, subjective vs objective, casual vs expert, and context specific vs context removed.

Two commonalities between the four firms arise from the cross analysis: their use of literature and their use of expert knowledge. The frequency of use and the validity of the sources varies between firms but also within firms, as certain “depths” of studies are more appropriate for some applications but not others.

It was initially hypothesized there might be a correlation between active/reactive approaches (discussed in the previous section) and high/low degree of evidence. But that does not appear to be true. For instance, Sasaki has a highly reactive approach and falls on the rigorous/objective level of the degree of evidence spectrum but Design Workshop, also implementing rigorous degrees of evidence, has a very active EBD approach.

Due to Design Workshop's front-heavy EBD design process, they typically collect qualitative evidence through early community meetings, crowd-sourcing, interviews, and surveys. These sources usually fall in the mid-range of the Range of Evidence chart (see Figure 1.1) because the data is largely subjective but if responses are collected through credible research methods, the study as a whole becomes more objective. Design Workshop also readily collects quantitative data through use of their measurement tools backpack for on-site measurements (often for site-scale analysis) and through GIS data analysis (typically for large-scale planning efforts) both of which are very context specific. The firm will often hire expert consultants in fields like ecology and hydrologic engineering to provide both expert testimonial as well as to collect and analyze their own field data. While other firms use precedent projects to gain creative and aesthetic inspiration, Design Workshop will use precedent projects as benchmarking comparisons to their own projects – a more scholarly use of precedents.

Mithun's range of evidence falls more on the subjective and casual exploration scales. Design teams look towards best practices, lessons learned, and experiences from each other, from within the firm, and from colleagues throughout the region. This creates a casual collection of precedents that serve as idea generation rather than benchmarking as Design Workshop does. Expertise ranges from product representatives to consultants; the most expert-level really being the academics who come in and discuss their research. The most robust application of evidence across a majority (if not all) of their projects is the use of a certification system or framework for measuring performance. These systems are largely based on current and credible research (although some more than others) in order to establish best practices. Mithun's use of evidence is predominantly context removed because the evidence or insight gleaned can be applied to multiple projects.

Sasaki's evidence type is highly context specific and nearly all quantitative. The data collected and analyzed by their Suite of Tools is collected and/or produced and organized for a specific site. Through their crowd-sourcing tools new data is produced, and although it is often a mix of quantitative and qualitative responses, the analysis is quantitative. They also use existing data sets often provided by the institutional client. Both existing and new data are spatially extrapolated – similar to the McHargian method. These examples along with their alternative scenario modeling tools, like The Prioritizer, put Sasaki towards the high level and objective end of the Degree of Evidence scale.

OLIN's collection and application of evidence is widely variable because the partners have very different approaches to EBD, and because evidence at OLIN is considered on a case-by-case basis depending on the research question or issue posed. Quantitative data use at OLIN consists of GIS spatial data sets and using BIM technology to retain complex information and analyze performance. Both of these examples are also very context and project specific. In contrast, their extensive Knowledge Base of studies, literature, and precedents is context removed but has a sampling of both qualitative and quantitative information. OLIN will often collaborate with experts in related (and seemingly unrelated) professions. These relationships vary between expert and casual explorations – the related professions like ecological engineering or bioscience being the more expert level. Towards the more subjective and less quantifiable side of the spectrum, OLIN prides itself on having a general awareness of culture, processes, and systems on each of their projects.

Development and Evolution

The four firms are similar in their academic roots and in the time period they began to formalize their EBD approaches. They differ however in how they chose to evolve those approaches and the necessary components to do so.

One of the strongest, yet more obvious, similarities between these four firms, is that all four firms were started by academics. This directly influenced the development of EBD approaches as each inherently was built on concepts of inquiry, exploration, and research. Another similarity is that, despite each of the firms' mid-century establishment, the emergence of each firm's EBD approach followed much later. For Design Workshop, metrics and performance started to shape their DW Legacy Design® philosophy in 2000 – initiated by the need to gauge success. Like Mithun, one of Design Workshop's first EBD projects was LEED certified. For Mithun, their first LEED project was in 2002, and the LEED process has been fully integrated into their practice for the last five to ten years (c. 2005). For Sasaki, the idea of technological tools to track scalability and flexibility in the planning process came about five to ten years ago (c. 2005). Finally, for OLIN, their first significant EBD application was in 1978 but the Directorship was established around 2006-2007.

The way in which the different firms evolved their approaches varies widely however. Design Workshop almost immediately saw the need for a formal, systematic approach. They initiated staff education to get everyone on the same page concerning EBD. Some ideas did not take off (Forum Leaders) but they saw increasing efficiency in the process as it was practiced and repeated. The

evolution of Mithun's EBD approach coincided closely with the evolution of LEED. They continue to be active participants in the evolution of the SITES system as well. Sasaki's pragmatic approach – its tone set by Hideo early on – begged for valid and credible evidence to support design solutions. The evolution of their EBD approach largely followed technological advancements – turning the hand-produced McHargian-style layers of information into large analytic data sets. It was the need to parallel the planning process with the design process that sparked the formation of the Sasaki Strategies group. OLIN's approach also flourished due to technological advancements. In addition to following technology closely, their EBD approach evolves based on how society and culture evolves. Lastly, each partner at OLIN treats the process differently and its state today is due to that amalgamation.

INTEGRATION

Design Process

The four firms have each developed unique design processes but characteristics of their processes share similarities that differ from a typical design process. These design process characteristics include being iterative, having an inclusive fee structure, being scalable and replicable for efficiency, and having innate creativity.

One of the most consistent similarities across the four firms is that their design processes are distinctly iterative. Design Workshop employs rapid cycling to enable new evidence to inform the design process. Mithun speaks of an iterative process where they recalculate benchmarks throughout the process. Sasaki's real-time scenario modeling allows quick and flexible iterative decision making and the data their tools generate can feed back into the analysis loop. OLIN specifically mentions the importance of assessing performance throughout the project. The iterative process and consistent benchmarking has led to a need at three of the four firms to measure post-occupancy performance. Design Workshop, OLIN, and Mithun all echoed the need for post-occupancy performance – if the time, money, and partnerships are right. Design Workshop is more consistent about post-occupancy performance evaluation because of their commitment to their legacy mission and measurement over time. Sasaki may be less concerned about performance measurement because their EBD approach deals largely with planning projects and less built-work projects.

Another similarity shared by these four firms, something more uncommon within other firms', is the integration of EBD as part of the standard fee structure.

Design Workshop and OLIN specifically state that there is no separation between research and design at their firms and therefore there is no separate fee line item. Sasaki echoes this idea but Hibbard notes that this is because research at Sasaki is specifically targeted, project-specific research; if a tool has to be developed, it is done as part of the project fee. Mithun's answer to the integration is that evidence gathering can remain part of the process so long as efficiency is streamlined.

One reason why the integration of research and design is successful at Design Workshop, Sasaki, and OLIN might be because their processes are purposefully scalable and replicable. Design Workshop's outlined steps and Sustainability Matrix can be used on any project of any size. Sasaki has adapted its analysis tools (or created new ones) to be usable on different projects. OLIN identifies projects by type to pull out salient themes that can be addressed with targeted investigation. Mithun's design process could be considered replicable because they are repeatedly using rating systems. The scalability and replicability of these four firms' design processes allow them to make research in practice efficient and profitable.

One distinguishing difference between the four firms' design processes is how formalized it is. Design Workshop has set up a deliberate, directive, outlined procedure for research and evaluation that emulates the scientific process. Design Workshop's Sustainability Matrix is carefully laid out to document goals, metrics, benchmarks, and outcomes throughout the project. Mithun's process is perhaps the second most formalized design process in that it is more alike to a typical design process. Rating systems are consistently used as frameworks to derive sustainability goals and to assist in tracking and documenting. Sasaki and OLIN do not have such directive processes. OLIN's design process varies based on the partner in charge, but the consistent practices include establishing goals at the project kick-off, investigating context upfront, and finding evidence as questions arise. The formality in OLIN's process comes from the care they take to collect the right kind of data, organize data, and analyze data. For Sasaki, the application of the Suite of Tools in the design process is not prescriptive and can vary widely between projects. Knowing that their approach is reactionary and deductive, the tools are considered to be incidental to the design process, meaning they solve a particular timely need. The formality of each firm's design process varies with Design Workshop being by far the most formal.

The four firms' design processes also differ slightly in when (at what point in the project timeline) characteristically-EBD processes are implemented. There is no doubt that evidence is used at various stages throughout the firms' design processes but the idea emerges that some areas are more weighted than others. In Design Workshop's front-heavy EBD process, they set up an agenda early on, gather background information early on, and engage in strategic kick-off (SKO) meeting exercises. Products of the SKO process include a clear dilemma, thesis, measurable goals, and interdisciplinary team responsibilities. Design Workshop believes that once the train has left the station, it is too late. This means that they are willing to do the bulk of the work up front in order to set a project up for success and efficiency throughout the design process. OLIN's EBD application on the other hand is more weighted on the back-end considering their more unique EBD focus on material properties, fabrication, and installation. OLIN's design process does however make use of upfront investigations to ensure design decisions are purposeful. They also strongly advocate for the concept that evidence-based design is about informing design decisions throughout the life of the project. It is not just in the beginning or at a particular bookended phase but really revealing itself throughout and one has to critically reassess the role information has in the project. Sasaki's design process is analysis-phase heavy largely due to their EBD approach being more geared toward planning projects. The planning process however, could require use of the analysis tools at any stage because the Suite of Tools is often used to confirm or deny intuition - a reactionary approach. Mithun's design process involves smaller applications of EBD throughout the design process as they check boxes on various certification requirements (assumed to be derived from evidence-supported best practices). Much of the work to document their sustainability goals for any particular credentialing body happens most heavily in the end phases of a project. The four firms are alike in that much of the evidence gathering, investigation, research, and informed decision making is concentrated in the beginning or end of the design process.

One final similarity shared between all four firms is that they believe creativity is not compromised by a design process influenced by science. Design Workshop believes that problem solving *is* the creative process. Sasaki echoes this saying that the analysis tools do not ultimately make the decisions; the design team still has to be creative to find meaning and significance, and to solve problems presented by the data. The Suite of Tools itself is a major creative endeavor. Mithun and OLIN also agree with this sentiment.

Implementation and Components

While the four firms' design processes could by no means be described as the same or similar, there are similar components and characteristics to them. Namely, the similarities are that the EBD processes are iterative, there is a shared interest in measurement over time, the processes are not separated in the fee structure, they are more likely to be weighted in the initial and final stages of design, and that they are inherently creative processes.

The implementation and components these four firms have developed to support their EBD approaches are staggeringly similar. They were put in place to increase the efficiency and replicability of each firm's EBD approach. To some degree or another, each firm has developed a means by which to organize and analyze data, a digital repository to store and access information, and a platform for continuing education and sharing knowledge.

The four firms each have a means by which to organize and analyze data. OLIN's use of BIM technology, Google Fusion Tables, and parametric modeling are examples of how the firm utilizes technology developed by a third party. Data, properties, and information are stored within elements and systems to make informed complex decisions and to design based on real inputs. Sasaki's Suite of Tools provides the means to gather, assemble, analyze, and visualize large amounts of data. Design Workshop has a more analogue way of organizing, documenting, and aligning goals to design decisions through their Sustainability Matrix. Mithun's means to organize and analyze data is less defined but the rating systems they use in their EBD approach provide some level of organizational framework.

Another commonality between the four firms' implementation and components is that each has conceived and developed a system to store and share information. OLIN perhaps has the most advanced form to store and access information in their Knowledge Base. Built by an in-house librarian and archivist, the Knowledge Base is a proprietary platform. It serves as a searchable database housing a library catalogue for hard-copy and digital resources, projects, research, lessons learned, and precedents. For Design Workshop, it is their similarly formatted employee-populated Portal that acts as a searchable database and platform to store information for others to use in the future. Mithun makes note of a system of resources on their internal website that is also populated by staff although it was not identified by name and earns only brief mention during the interviews. Mithun's extensive use of their public website to post blogs about current research or trends allows others both within and outside of the firm to see that transparency.

The interviewees of Mithun, however, mention that they communicate most frequently through talking and emailing directly. Sasaki has an intranet-based library to house the tools that the Sasaki Strategies group develops but it seems confined to that use. Each storage and access tool used across the firms is meant to bring the design teams closer to the information to increase its use and benefit. It is also meant to streamline information so that the information one team gleans can be made accessible to other teams in the firm and to other teams in the future.

Three of the four firms have developed extensive means to ensure continued education and sharing. Design Workshop does this in smaller portions more frequently through their robust series of lunch-n-learns. This could be outside speakers, employees presenting topic-based projects, or current research underway. Less frequent but more in-depth are Design Workshop's Symposia. These office-wide, near-mandatory design reviews allow the firm to focus on issues trending across similar project types. It provides a platform for consistent application of the firm's vision and engagement with other project teams to benefit all projects. The last example from Design Workshop was used in the early days of the Legacy Design emergence but is no longer in use. Legacy Design Days were pencil-down days to educate and discuss the Legacy Design process when it was first introduced. Mithun's efforts to converge ideas and continue education is manifested in their frequent professional and academic guest lecturers who come into the office and talk about their own research or practice. Mithun also conducts office-wide design critiques to encourage sharing lessons learned and experience across project teams and disciplines. Their requirement for all staff to be LEED accredited also lays the expectation for continued education through USGBC's CEU model. OLIN has implemented an education series over lunch to allow experts within the firm or beyond to talk about their specialties. OLIN has also developed their Theoretical Basis Group that encourages more communication about design and theory between the decision-makers at the firm and the younger staff who often bring new ideas to the table. Sasaki was the one firm to not mention any formal directives, beyond the Sasaki Strategies group itself, with regards to establishing a platform for sharing and educating its staff.

Firm Organization

Each of the four firms states that their fundamental firm organization has not changed; however, in order to guide and support the implementations and components previously discussed, positions were created and new responsibilities defined. Each firm also discussed new expectations for the role designers play within their project teams. Design Workshop, OLIN, and Sasaki have developed more

firm-wide roles, while Mithun has made changes to roles within design teams. Although the way firms are organized to support the EBD approach manifests in different entities, the need for certain roles is a striking similarity across all four firms.

Design Workshop created the Director of Legacy Design position to develop and oversee the Legacy Design initiative. This role has evolved from being a design researcher role to having more of a quality management role with respect to the Legacy Design initiative. Design Workshop has also developed and implemented Legacy Design Representatives, one in each of its offices, to ease communication and ensure consistency of the Legacy Design initiative across offices. A role that was conceived but then abandoned during the recession was the idea of Forum Leaders, which would represent each of the four Legacy Design principles. Where Design Workshop eliminated the idea of Forum Leaders, OLIN's EBD firm organization is largely based on the Directorship which essentially represents the same idea. The Directorship outlines one principal to represent, manage, and disseminate information concerning each pillar of the firm: research, green infrastructure, and technology. The three directors are tasked with focusing teams on what areas of evidence are relevant to their design process and guiding them through brainstorming and evidence gathering. OLIN has also developed the firm-wide research librarian roll, the director of research role, and has built an informal research team around that. Sasaki, similarly, has implemented its Sasaki Strategies group to be the think tank in charge of developing data collection and decision making tools for the benefit of the firm's projects. It is also their role to share expertise among the designers who do not know how to use, or best implement the tools yet. The Strategies group make-up developed more at the grass roots level as compared to OLIN and Design Workshop's director positions; meaning that the group's inception and viability comes from multiple, emerging-professional staff rather than hierarchical positions. The Strategies group also consists of and is supported by the firm's in-house programmers and software engineers who are also part of the EBD firm organization. It is of importance to note that all of these positions across the three firms are filled by people who have their own project work and teams. This makes it easier to bring knowledge to the table when that person is already at the table.

When it comes to the roles within a design team at each of the four firms, there is one resounding similarity. Despite firm-wide roles in place at these firms, it is the expectation that everyone should share in the responsibility of finding evidence or developing expertise to support their designs. In this way, the expertise is shared

among the project team and no one is expected to be an expert on everything. Sasaki has made it a point to diversify their project teams by hiring experts from fields beyond design. For instance, programmers and finance majors have become part of the typical project team makeup. Where Sasaki once had to outsource this scope or depend on the client to do it, they now can offer that service in-house. Design Workshop also has instilled an expectation that each team is responsible for their own evidence. Therefore, the firm has developed the role of Metrics Champion who is a person on each project team, selected at the start of each project, and who is in charge of the Sustainability Matrix. The pre-existing role of project assistant on each team at Design Workshop has the added responsibility of ensuring outcomes are documented. The team-roles allow the project team to be self-sufficient with the guidance of one of the firm-wide roles. Mithun currently has a similar, informal, analytical champion on each team. That person may be shared between teams. Mithun echoes the other firms' philosophy that, not only is it everyone's responsibility to be their own experts, but by doing so, knowledge and expertise is more widely shared amongst teams. This is encouraged by Mithun's anti-silo firm organization. As designers work on multiple projects with multiple different project teams to optimize expertise based on project needs, there is more cross-over between studio teams both among landscape architecture staff and other disciplines. Sasaki also mirrors this idea by setting up project teams to cross-pollinate as much as possible. OLIN echoes the philosophy of dispersed expertise among teams and the reality that everybody cannot be required to know everything.

Design Culture

The four firms describe similar design cultures that support their EBD approaches. The similarities address the attitudes and personalities inherent of their employees and the physical office spaces. Both of these factors support but are not a result of the firm's EBD approach. The four firms differ however in their overall communication priorities. There are additional distinguishing efforts employed or recognized by the firms that build their overall culture.

When each of the four firms was asked how they encourage their designers to share in the evidence-base design mission, each generously describes their employees as devoted, curious, self-motivated, self-assessing, challenge-seeking, and invested individuals. Design Workshop adds transparency and inclusivity and Mithun adds entrepreneurial to the list of qualities that make up their design cultures. Sasaki mentions the value of a technologically savvy culture to help support its EBD approach. The commonality is that none of the firms or leadership has to convince its employees to put forth the effort and time to

integrate an evidence-based process. The types of designers that are attracted to the firm in the first place simply share characteristics and personalities that support and sustain the EBD approach. Designers at each of the firms also set the bar high for each other, motivating others to challenge themselves, to be curious, and to problem solve. Each of the firms also encourages their employees to explore individual interests. This is how expertise and knowledge sharing is generated. Design Workshop adds that “success breeds success” when setting the bar and attracting new talent to the firm.

Each of the four firms describes that the physical office did not so much as change because of the evolution of the firm’s EBD approach but that their physical spaces are deliberately set up to support and cultivate their desired design culture. The office spaces are described as being collaborative, open offices where there are spaces to convene at communal work session tables. Individuals are not isolated to encourage communication, sharing of knowledge, and transparency. Sasaki describes this model as an office without offices. Observations made at each of the offices confirm large open spaces, Mithun and OLIN have the largest unobstructed spaces; and pods grouping project teams or studios together to give some sense of ownership of space.

The four firms have instilled varying communication expectations to support their EBD culture. Design Workshop’s priority is their inter-office communication. Since the firm has many offices across the country and the world, it is important for them to streamline ease of communication so that it feels like one office. OLIN is working on more frequent, open, horizontal communication between its staff. Mithun admits that informal communication satisfies their needs in the office.

There are a number of distinguishing efforts happening at the firms to build on their office cultures. Each has some, but variable, impact on the EBD approach. Both Mithun and Sasaki mention that their curious and driven nature is so ingrained in what they do that they have turned the analysis lens on themselves. For instance, Mithun has implemented a number of sustainability measures at its own firm and for its own employees in an effort to gain an understanding of what they ask of their clients. Sasaki, likewise, has had practice analyzing itself when it used its own Watertown office to evaluate various measures during a pilot test of some of the Strategies' tools. Another distinguishing design culture characteristic, that Mithun notes, is that their design culture is, in part, a reflection of an attitude prevalent in the Pacific Northwest design circles. The firm suggests that there is a culture of mutual sharing amongst firms and a high regard for sustainable practices in the

area more-so than in other regions of the United States. OLIN's design culture, on the other hand, differs with respect to their varied styles cultivated by the different principals. Design Workshop differentiates itself as having a focus on professional development; so much so that the firm will financially support those who wish to return to school for a graduate degree. These differentiating design culture factors discern each of the four firms from each other but they are not necessarily unique among the full spectrum of landscape architecture firms.

APPLICATION

Clients and Client Relations

Although each of the four firms has different project types, strong similarities emerge in how they win clients, why clients seek them out in the first place, how they communicate with their clients leverage decisions, and which clients they find more receptive of or reluctant to their evidence-based design approach.

Design Workshop, Sasaki, and OLIN all agree that, although they have not seen significant changes to the client types with the evolution of their EBD approaches, changes have occurred in how they communicate and leverage decisions due to their implemented EBD approaches. Mithun on the other hand has seen a more significant shift in their percentage of national clients because they have gained a footing in the sustainable design and EBD market.

All four firms allude that clients seek them out specifically for their EBD approaches, their research efforts, and their history of designing for performance. Mithun adds that clients are attracted to them because of the promotional aspect of rating systems and certifications. However, not all of Mithun's clients come to them with the expectation for performance measurement and there is some convincing that takes place. Sasaki sees clients coming to them specifically because they have complex data problems that Sasaki is able to decipher and respond to critically. Sasaki also mentions that, because clients come to them specifically, the firm earns a certain level of trust with clients to explore, test, and rework as part of the design process. OLIN has seen an increase in client expectations for proof of performance, namely due to the rise of SITES and LEED. The computer age has brought information closer to clients; they hear about what others are doing and come to expect that same deliverable. OLIN's clients are therefore looking for that built-in research and evaluation process that the firm is able to provide. All four firms have evolved to become known for their EBD approaches and what they can provide to clients.

A striking similarity shared by all four firms is the type of clients they design for, who are more receptive to their EBD approaches. It appears that when public funding is at stake, clients are expected to provide performance outcomes to their stakeholders and that the four firms' EBD approaches can produce those assurances. These clients, the firms say, are required to or have an interest in documenting and reporting performance. For Design Workshop, these are their public clients, municipal clients, and business improvement districts. Mithun echoes that and says their city and public agency clients, who have requirements for reaching a certain level of LEED, are the most interested in performance. OLIN suggests that their government clients are moving more and more towards performance documentation. Sasaki says their university clients are typically the ones most interested in the firm's analysis, especially financial analysis, because they are expected to provide that information regardless. Mithun also adds that, in addition to public clients, private clients who want to demonstrate their own commitments to sustainability are more likely to seek out a firm that has a reputation for that kind of expertise. Design Workshop mentions that, in addition to being more receptive to evidence-based design, their public clients are more likely to have the resources to help with baseline data collection and ongoing measurement. These clients also may be required to provide ongoing performance data to constituents.

Each of the four firms advocates for including clients in the design and decision-making process. Design Workshop primarily creates transparency by including their clients in the early Strategic Kick-Off meeting (SKO) goal setting exercises. Sasaki ensures transparency by using the Suite of Tools for instant alteration and feedback. The tools also provide visual evidence when clients challenge assumptions made by the design team. Mithun and OLIN have primarily found a strong need to educate clients throughout the design process. OLIN adds that more data means more expectations and they have found themselves needing to not only educate the client about the possibilities from an evidence-based design approach but also tame their expectations since much of the analysis is done behind the scenes.

Design Workshop and Sasaki discuss the types of tough or reluctant clients they see during their EBD efforts. Design Workshop says it is their residential clients who are most reluctant about research and EBD. Sasaki says the opinionated, politically charged stakeholders and clients are the most reluctant to invest in an EBD process but are also the ones who benefit most from objective decision making. Sasaki reiterates that although few of their clients will actually resist a data-driven

analysis of some kind, there are some clients who are reluctant to a certain depth of analysis. Sasaki says that the smaller education institutions they work with do not benefit as much from their full depth of analysis simply because they have less data, less variables, and can keep track of those more easily than a larger institute.

Design Workshop and OLIN specifically mention that the effort to monetize performance benefits helps translate benefits into a language clients, especially the reluctant ones, can understand. Whenever they can produce the financial benefits associated with any social, economic, or environmental goal, the goal is more likely to make its way into the project because it has the support of the client. While not mentioned directly, Sasaki's Smart Plan and Prioritizer tools take into account financial metrics and the clients can see the impact of their decisions more readily.

Types of Projects

The types of projects that the four firms typically see coming into the office, and are therefore best suited to a comprehensive EBD process, are characterized as complex. The complexity of projects requires organized documentation and application of evidence to support decision making.

Design Workshop says their projects are complex largely based on the multidisciplinary team that is required of high-performance projects. Evidence is the universal language between these disciplines and the careful organization and documentation of such evidence, as it is tied to the clients' goals, makes for deliberate decision making. Streetscape, corridor, and master planning community projects are all examples of complex, multidisciplinary (and multi-stakeholder) projects at Design Workshop that are best supported by their EBD approach. Mithun describes that EBD is most useful on projects that are considered innovative or pushing the boundaries, and thus complex, because there is no precedent. The evidence gathered and shared with clients or consultants makes it easier to build a case for implementations that have never been done before. Mithun describes their complex projects as "deep green", alluding to the many sustainable performance metrics they try to achieve. Mithun's projects are also complex because, in their often tight urban spaces, each design implementation must meet several performance goals to be beneficial in that space. Mithun also echoes Design Workshop in believing that complex projects require multi-disciplinary integration; Mithun sees this especially in their interdisciplinary office. Sasaki describes their projects as complex because of the large-scale planning and the sheer volume of data to organize. Sasaki's university work often delivers large planning dilemmas with large data sets which means

more analysis is required. Their computing and visualizing Suite of Tools helps quickly accomplish, what teams of designers would need weeks to comb through. Sasaki's renovation projects, typically at university campuses, are also complex in that they require a much more in-depth understanding of existing conditions in order for the design team to make purposeful and precise interventions. OLIN self-describes their EBD projects as complex because a lot is required to coordinate, understand, and document all of the evidence needed to make design decisions. The efficiency and accuracy being required more and more on complex projects is stretching designers thin. An EBD process and review of evidence allows designers a certain amount of efficiency and accuracy. All four firms agree that their specialty project type is one of inherent complexity. How these four firms are seeing that complexity develop, however, differs.

Similarities found between the four firm's EBD processes; including scalability, replicability, and comparability; reflect in the types of projects that are best suited for EBD processes. Design Workshop, Sasaki, and OLIN have each declared that their EBD processes have developed and evolved to be scalable to any project type and scale. Mithun's EBD process is noted to be replicable. Replicability and scalability of EBD processes to different project types and scales allows each firm to integrate evidence and research into the design process efficiently. It also allows the firms to compare like-projects because of similar metrics and methods used. Design Workshop and OLIN both mention that they are deliberately working on this so that similar project types within the firm can benefit from the evidence and research methods used on projects of that same type. It is as if these two firms are creating project archetypes of research in design.

Unique characteristics of project types, that both work well with or are difficult to apply EBD to, also emerge from the four case studies. Design Workshop mentions that its residential projects are difficult to apply EBD to because there is typically less complexity and the client is more concerned with financial benefits. The firm has embraced this challenge and continues to work on identifying the most efficient use of evidence and performance benefits for their residential projects. Mithun recognizes that their local Seattle and Pacific Northwest projects rely more heavily on their EBD process due to unique regional codes and a general high level of performance expectation from the design community in that region. Mithun's projects in other locations around the U.S. depend on more education of the client and consultants to convince them of the benefits of both evidence-based outcomes and the EBD process itself. Sasaki mentions that their competition work benefits less from an EBD process

because the context and associated risk is often removed enough that they do not have the data or access to the data to make use of their Suite of Tools. Sasaki also notes that any project having only single-phase analysis does not benefit from the cooperative EBD process. Knowing that Sasaki's EBD approach was born from the planning studio; currently, their built work does not often see a comprehensive EBD process. The type of projects that OLIN sees benefiting most from an EBD process (in addition to complex projects) is one where research can coincide with the billable work. This is the most sustainable way for the firm to practice EBD. Therefore, OLIN's types of projects reflect the types of research they are able to explore.

Overall, the types of projects that each firm works on have not changed greatly in response to each's evolving EBD approach. However, evidence playing a greater role and holding more relevance in the decision making process has changed greatly. With more available evidence and fine-tuned processes, the four firms are able to tackle projects with greater complexity. Or it is simply that the firm works on the same types of projects but is able to add more layers of complexity to ensure higher performance.

Consultants and Consultant Relations

The relationships that each of the four firms have developed with their consultants in order to best support the EBD approach is strikingly similar across all four firms. Each firm expresses and reiterates the need for good, communication between expert consultants on project teams. OLIN describes the need for consultants to be integral on the project team from the beginning. Sasaki describes the value they place on consultants because one cannot be an expert in everything. Mithun discusses that they specifically gravitate towards consultants who use scholarly evidence in their own work. They are strictly committed to working with the right consultant, no exceptions. Design Workshop describes a process for getting design team consultants on the same page for sharing in the responsibility for evidence gathering.

While each firm relies heavily on their consultants for expertise, Design Workshop and Mithun specifically mention a symbiotic relationship of educating consultants in the EBD process. Both firms describe examples of taking consultants through the process, involving them in the visioning sessions, and giving consultants ownership of the EBD process. Both firms also noted that they have been hired specifically to lead this process with consultants, other firms, and contractors. Design Workshop adds that consultants and sub-consultants have reacted positively for the most part and are pleased to be part of the conversation.

There are also several differentiating characteristics of each firm's relationship with their consultants. Mithun notes that when they have projects outside of the Pacific Northwest, they expect to be educated by their local consultants. OLIN sees evidence as the common language among designers and the allied professions. Evidence is therefore used at OLIN to break through communication barriers with their clients. OLIN also has evolved to seek out seemingly unrelated professions for evidence, expertise, and/or input on design and fabrication. Sasaki is perhaps the most unique among the four firms because they utilize and communicate with their consultants less up-front and more for addressing questions as they arise. Sasaki might not contract with consultants in the early phases of a project due to fee constraints but they have developed a repertoire with prior consultants and have an "on-call" relationship as they seek direction and understanding.

While the four firms describe their relationship with consultants variably, the overall attitude and respect for consultants across all four firms is very similar. Relationships are characterized as being cooperative, transparent, educative, and early involvement. The consultant-designer relationship is crucial to having a successful EBD approach because consultants are the design teams' first-person expert in gathering evidence and providing evidence from experience.

Marketing

The four firms are similar in how they market their EBD approaches. All four firms agreed that the work they do, their EBD process, their tools and expertise, simply markets itself. Each of the firms' EBD approach has significantly changed how the firm markets itself because the EBD approach has become so ingrained in what the brand of the firm is. All four firms also agreed that the EBD approach markets itself. As each firm publishes, speaks, and implements high performing landscapes, clients are increasingly seeking each firm out for their unique approaches. Design Workshop is able to market their formal EBD process. Mithun gets hired from a national pool for their expertise in LEED and SITES. Sasaki markets its Suite of Tools and the ability to marry design and analysis. OLIN markets its directorship as a tangible representation of knowledge and practice. These are part of each firm's overall EBD approach that no other firm is able to offer. Therefore, the development of these processes, implementations, and components not only offer design solutions in practice but become marketable pieces of the firm's brand.

The four firms' tools, components, and process are not the only piece of the EBD approach that markets itself. The products of the internal research are also marketable. Meaning that as more EBD and research happens at each firm, more

material is available to market. Design Workshop describes that sharing research studies and findings helps to attract other projects; it helps to build the brand and reputation of the firm. As Mithun achieves LEED or SITES on a growing number of projects, their firm name is tied to that certification. Sasaki's use of the Suite of Tools in front of clients or to show potential clients helps to market that tool because the clients become familiar and have experience with it. OLIN likewise mentions that their products of research become marketable to future clients. For each firm, as clients come to understand and value each of these firms' approaches, they often become return clients.

The extent to which the terms evidence-based design, evidence, and research are used in marketing material varies. Design Workshop extensively describes their Legacy Design process in each of their marketing brochures and RFP submissions. Design Workshop's website also includes a description of Legacy Design as well as case studies the firm has done and even offers research topics that can be picked up by academics to further the profession's knowledge base. Mithun on the other hand makes little to no mention of the EBD approach but speaks extensively about their expertise in LEED. Additionally, Sasaki and OLIN's marketing material is unspecific about EBD and or research although Sasaki will occasionally depict some of their decision making tools. Mithun, Sasaki, and OLIN all have pages of their website that include reflections on articles or current research trends. These posts are more blog-like in nature and not original research findings.

As the marketplace for landscape architecture work is growing to require more accuracy and accountability of information, these four firms are able to advertise their EBD approaches, relatively uncontested, in an emerging market.

PROPAGATION

Reporting

Each of the four firms reports and communicates beyond their own office in a variety of ways and can be discerned by the rigor, frequency, topic, sensitivity, and reach of their reporting efforts.

The means by which each firm disseminates information ranges on a scale from the more casual to the more scholarly. Sasaki is on the casual side of reporting simply because they do not report often. Sasaki employees will occasionally speak and publish but not often about the Suite of Tools or the EBD approach. This attitude could be reflective of Hideo Sasaki's known reluctance to speak or publish. Sasaki

will, however, have the occasional article in a non-peer-reviewed publication. Their approach to reporting is more solely pragmatic than the other three firms. When reporting or sharing happens, it is almost always project-related. Whether through community involvement, open-sourcing, or their presence at APA and ASLA conferences; the topic is, more often than not, tied to a project. The innovation from the project itself is of interest to the audience, not necessarily a generalist review of their process.

Mithun is perhaps the most casual when reporting their EBD efforts but they do so with a high level of frequency. The firm will often share their current EBD work on their website, reveal snippets through social media, and share with the community and industry organizations with which they collaborate. Guenther has also been known to present at several professional conferences and through webinars. The topics range from project-specific to general EBD and LEED practice.

OLIN strongly supports sharing knowledge because it benefits the profession and it is important to build on existing knowledge. OLIN has a bigger presence at conferences and through webinars than they do in published articles. OLIN is most sensitive to divulging proprietary information, especially clients', and disclosing research efforts and tools. The firm recognizes, however, that repeated presentation of evidence within the field helps to build a case and therefore can help OLIN in the long run when leveraging design decisions with clients, consultants, or even other landscape architects. This is also true of reporting beyond the landscape architecture field, which OLIN strongly believes promotes and adds credibility to the profession.

Design Workshop is the most formal in their reporting. Based on Hamilton's Four Levels of Practitioners, Design Workshop would be a level three or four because they "subject their work to the highest level of rigorous review" (Hamilton 2004). While they have not published research findings in a peer-reviewed journal, the firm has been evaluated by academics and other practitioners. Design Workshop designers are consistent voices at national conferences as presenters. Culbertson was even one of the first practitioners to attend CELA regularly. Staff will author articles in trade publications and journalists have written about the firm in various magazines. Design Workshop is also most transparent of the four firms because the content of their reporting is often their process and approach. Overall, the firm is very open to sharing their process publicly.

A common thread between all four firms is that they share the belief that reporting to and beyond the field is better for the profession at large; it makes the profession's collective work better. While there is room for growth in the frequency and rigor with which firms publish findings, the recognition for that need and their active participation in the conversation, speaks to the important role reporting plays in an EBD approach.

Collaboration and Outreach

This category of the case study framework was one of only two that were not anticipated going into the interviews and yet it was a theme that reoccurred throughout each of the interviews. Each of the four firms often collaborates with academic institutions and professional organizations to incorporate research into practice.

All four firms reiterated how important partnering with academics to conduct research is because the two parties can share resources and expertise. The close ties likely stem from each firm's academic roots. Graffam, at OLIN, and Culbertson, at Design Workshop, both have strong personal missions to collaborate with academics. They both actively share in the education and academic ethos of their firms. OLIN recognizes that practitioners and academics have different motives for research but have access to resources that the other could benefit from; the intent is to find that point of mutual interest and benefit. Design Workshop also shares that mutually beneficial viewpoint as they partner with academics to do measurement and then return the favor through their annual Design Week charrettes at universities and co-authoring articles together. Co-authoring efforts have been both on behalf of professors' research as well as about Design Workshop as a firm. Sasaki engages with academia more by acting as the bestower of information rather than the recipient. Several Sasaki employees have teaching engagements at the university, carrying on Hideo's legacy with Harvard. However, Sasaki's work on university projects inevitably enlists teachers, students, and staff during the data collection and analysis process. Sasaki employees will also often serve as jurors for student competitions and awards, and as facilitators for critiques and charrettes. Sasaki's sharing of knowledge and evidence is therefore less direct since they do not often share their EBD process directly. Instead, information and experience permeates through their relationships. Sasaki does however aspire to do more direct research with institutions but they do not yet have the right model for that collaboration. Mithun has a similar indirect relationship with academia as it pertains to EBD but the sharing of knowledge is more balanced as compared to Sasaki. Mithun has a close relationship with regional universities, they often have professors come to the

office to present research; and, like Sasaki, some of the practitioners teach classes. Mithun has also engaged university classes to help do performance monitoring. OLIN believes in a truly mutual relationship between academics and practitioners despite there being a different understanding of what research is (basic vs applied) and each party has their own agenda's for what type of research will benefit them the most. Because of this schism, however, each party is also able to provide the other with resources and knowledge the other does not have.

The Landscape Architecture Foundation's (LAF) Case Study Investigation (CSI) is a more formal platform for practitioners to work with academics towards a structured directive. Design Workshop and Mithun have both been involved as practitioners for LAF case studies as well as for various webinars put on by the LAF on the topic of landscape performance. Both firms are also known to engage civic institutions in assisting with ongoing performance monitoring and Mithun has also been active in the SITES evolution.

The continued and desired collaboration with academic, civic, and professional institutions similarly elevates each firm's ability to practice EBD efficiently and to share that knowledge with the profession's partners in storing and disseminating information.

Future Trends, Goals, and Fine-Tuning

Each of the four firms is setting goals for their own EBD approach advancement and would like to see different improvements in the profession. There are, however, distinct trends in how each of the firms plans to move forward. These trends include self-improvement, having better evidence available to the field of landscape architecture, and bridging the gap between practice and academia.

Regarding self-improvement, Design Workshop is consistently driven to continue bettering and evolving their approach. While the firm has developed quite a bit of direction, they believe they are far from done and that there is always room for improvement. Mithun is focusing on quantifying and leveraging health and economic performance to benefit design decision making. The firm's focus on environmental sustainability makes them acutely conscientious of the issues surrounding climate change and they recognize the impending need for more relevant evidence. Sasaki discusses their desire to expand the Suite of Tools into other disciplines at the firm and into their built work (its focus is currently the planning studios). The Strategies team is also committed to developing additional analysis tools; some areas of interest include energy systems analysis, more

surveying methods, financial metrics, and scheduling. Similarly, OLIN is looking to expand their Knowledge Base tool. This is critical to expanding the firm's expertise, credibility, ability to better understand evidence, and data management – all of which are ongoing goals at the firm.

Regarding the field of landscape architecture, both Design Workshop and OLIN hope to see more and better evidence being produced and becoming available for others to use. Both of these firms do this on a smaller scale internally but they want to see that mutually beneficial sharing concept expand to the profession, to allied professions, and to academia. Design Workshop also hopes to see a general improvement in baseline measurement, both in terms of practitioners doing this more frequently and the field, together with institutions and academia, developing better methods. Design Workshop has ingrained the need for baseline measurement in their own work and hopes the profession will assume that same responsibility. In relation to baseline and benchmarking, Mithun hopes to see more post-occupancy evaluation both in their own work and within the profession. Along with increasing interest in experimentation in design, Mithun expects that more performance studies will begin to close gaps in the field's knowledge base. OLIN adds that having stronger national organizations, open-sourcing tools, tapping into unrelated fields, and increasing collaboration amongst firms would benefit the profession at large while benefiting the firm's own EBD agenda.

All four firms anticipate and hope to see more overlap between academia and practice. This could mean increased collaboration, something both OLIN and Design Workshop mention, or practitioners becoming better researchers, as Design Workshop suggests. Both Mithun and OLIN suggest the idea of landscape architects getting more involved in grant-writing for research. OLIN even suggests developing a non-profit sector of the firm to make this possible.

As the profession continues to meet increased performance expectations and rapidly changing world issues, more firms will likely develop EBD approaches for applying evidence and research in practice. The four firms in this study share in this aspiration, not only for the good of the profession but for their own benefit in advancing innovation of EBD into the future. Together, the four firms foresee other firms catching up to the model of EBD approaches in practice.

CROSS-CASE ANALYSIS SUMMARY + MATRIX

Cross-Case Analysis Findings

This study discovered three primary findings through the case studies of four leading landscape architecture firms. First, EBD in practice is most effective when applied as a comprehensive approach addressing all aspects of the firm. It was discovered that each of the four firms had made some changes or identified specific areas of the firm that help support the EBD approach in each one of the case study framework sub-categories. This means that each firm did not become leading in EBD with simply one or two aspects addresses. The truly holistic and encompassing approach to applying EBD in professional practice is what makes these firms different the other firms.

Second, findings show that each firm developed their evidence-based design approach to address complex problems in design and in the profession - the processes specifically emerged to meet a need. The development of each firm's EBD approach did not happen on a whim or to keep up with trends - it was not even a trend in the days of these firms defining their approaches. The development of the processes came first to meet the need of highly complex projects. The approach further developed to add supporting components and roles to make that process more efficient.

Lastly, the cross-case analysis found several similarities and uniquenesses between the four firms. The similarities include: the firm emerging from academic founders, implementation of roles and responsibilities, creation of tools to organize and understand data, design cultures to support the EBD vision, how they communicate and work with clients and consultants, and that they report their findings for the advancement of the profession. It was found that the design processes themselves, however, vary dramatically across the firms. Finding both similarities and uniquenesses suggests that there are certain aspects of an EBD approach that are necessary but that can be delineated in different ways. For example, the need to share and store information is addressed by each of these firms but how the form in which they met that need varies. EBD in professional practice is therefore not prescriptive and does not always look the same

Cross-Case Analysis Matrix

The Cross-Case Analysis Matrix on the following four pages (Figures 4.11.1-4) illustrates the key findings from each firm's case study per the case study framework. Together it summarizes the findings from the Cross-Case Analysis. Commonalities between the four firms are highlighted in orange text, thus identifying the discovered unique qualities in black text. On the right side of the matrix are relativity scales. If a similar characteristic emerged but the firms differed in how frequent, strong, formal, etc. that characteristic was, a relativity scale was diagrammed to show where each firm resides relative to the other firms. Like the differences identified in black text, these scales help to distinguish one firm's EBD approach from the others.

Figure 4.11.1 Cross-Case Analysis Matrix (Elise Fagan)

• Color and bold indicates similarities across firms

	Design Workshop (D)	Mithun (M)
NATURE + EMERGENCE		
EBD Approach	<ul style="list-style-type: none"> • Structured, chronological investigation; sets up dilemma & thesis • Sustainability Matrix for projects; a process for measurement • Ensures accountability • Replicable procedures enables comparison of like-projects • Approach has its own trademarked name = DW Legacy Design® • "What gets measured gets done" -Culbertson 	<ul style="list-style-type: none"> • Relies on rating systems, certification programs, & regional codes to identify performance goals • Leveraging clients' need for certification to achieve performance goals • Holds client accountable • Use rating systems as a starting point but not the be-all-end-all; firm has adopted this as the status quo and will move beyond rating systems
Finding and Producing Evidence	<ul style="list-style-type: none"> • On-site measurements • GIS analysis • Crowdsourcing & community engagement meetings/charrettes • Experts • Precedent projects as benchmarking comparisons • Interviews and surveys 	<ul style="list-style-type: none"> • Use existing frameworks for measuring performance • Academic experts, consultants • Best practices, lessons learned • Experience of team members and others at the office • Product reps • Precedent projects
Development and Evolution	<ul style="list-style-type: none"> • Academic firm founders • One of first EBD projects was LEED • Initiated by the need to gauge success • Idea of performance measurement came in 2000 • Evolution of a formal, systematic approach • Re-educating staff • Repetition increased efficiency 	<ul style="list-style-type: none"> • Academic firm founder • Breakout project was LEED 2002 • Fully integrated LEED ~2005 • Followed the emergence and evolution of LEED • Active participants in the evolving SITES

D - Design Workshop
M - Mithun
S - Sasaki
O - OLIN

	Sasaki (S)	OLIN (O)	Relativity
EBD Approach	<ul style="list-style-type: none"> Investigative software to collect, analyze, and visualize data Alternative scenario modeling Non-static framework for design decision making Visualizing data makes the process more transparent and rational Sasaki Strategies team Tools incidental to the approach - reactive Data input but also data generated by design feeds back into loop 	<ul style="list-style-type: none"> Pragmatic application of existing and produced evidence Experimentation-driven inquiries Approach varies based on Partner in charge Embedded, implied, yet not articulated - no checklists The Directorship as an array of expertise 	<p>Formality </p> <p>Approach </p>
Finding and Producing Evidence	<ul style="list-style-type: none"> Evidence is context specific – collected and/or produced for that site specifically McHargian method – spatially extrapolated Existing data sets – largely quantitative data (Civic/institutional databases) Software will organize and analyze data Crowdsourcing – new data – could be quantitative or qualitative 	<ul style="list-style-type: none"> Variable - Type of evidence required depends on research question posed Collecting & storing literature, precedents, and experts in the Knowledge Base GIS - Spatial data sets BIM – retain complex information, analyze performance Experts in related (and seemingly non-related) professions Awareness of culture, processes, and systems – less quantifiable 	<p>Inquiries/Research </p> <p>Average Research </p> <p>Exploration </p> <p>Context... </p>
Development and Evolution	<ul style="list-style-type: none"> Academic firm founder The idea of a tool to track scalability and flexibility in the planning process came about ~2005 McHargian philosophy based - went from doing this by hand to doing it through computers The need to parallel the planning process with the design process and their impacts to budget, space allocations, phasing, etc. Hideo the pragmatist 	<ul style="list-style-type: none"> Academic firm founder First significant EBD application in 1978 Directorship started in ~2006-2007 focused on areas of research the founders wanted to pursue (education, ecology, & technology) Each partner treats the process differently and its state today is due to that amalgamation As society and culture evolve, so too does the EBD process need to evolve 	<p>Year of Est. </p> <p>Emergence of Approach </p>

	Design Workshop (D)	Mithun (M)
INTEGRATION		
Design Process	<ul style="list-style-type: none"> Deliberate, directive, replicable steps Outlined procedure for research and evaluation emulates scientific process SKO exercises identify dilemma, thesis, measurable goals, responsibilities Goals tied to measurable outcomes Sustainability Matrix documents goals, metrics, benchmarks, and outcomes Performance measurement over time No separation between research and design; no separate fee Problem solving = creative process 	<ul style="list-style-type: none"> More alike to a typical design process Deriving sustainability goals from rating systems Use of existing rating systems as framework - replicable Iterative process, recalculating benchmarks through the process POE goals but unachievable due to budget unless efficient streamlining Creativity is part of designing
Implementation and Components	<ul style="list-style-type: none"> Components increase efficiency and replicability, expand knowledge SKO goal setting exercise/charrette Legacy Design Days to teach the process when it first emerged Symposia = formal, office-wide, near-mandatory design reviews Continuing education - Lunch-N-Learns The Portal = staff-populated searchable database; stores and shares research studies and literature 	<ul style="list-style-type: none"> Required LEED accreditation for staff Office-wide critiques Professional and academic experts as guest lecturers Storage of resources on internal website; populated by staff Internal library to show off teams' project work Knowledge sharing on their public website
Firm Organization	<ul style="list-style-type: none"> DW Legacy Design® Director Legacy Design Reps, one per office Metrics Champion on most project teams, in charge of the Sustainability Matrix Project assistant documents outcomes (existing role, added responsibilities) Developing quality management role Abandoned idea of "Forum Leaders", one per Legacy Design principle Expectation that each team is responsible for their own evidence 	<ul style="list-style-type: none"> Anti-silo, more cross-over between studio teams than before It is everyone's responsibility to be their own experts Landscape team shares among other LAs but also to other teams; cross-team organization Individual EBD roles not formally defined Informal analytical champion role on each team (or shared)
Design Culture	<ul style="list-style-type: none"> Inclusivity, transparency, holism Deeply ingrained process and cultivated ideal design culture Devoted, self-motivating individuals Approach relies on self-evaluation Professional development achievement Idea of the workshop seen in physical spaces = convening and collaborating Dedicating extra time to explore indiv. interests "Success breeds success" in setting the bar and attracting new talent Constant inter-office communication 	<ul style="list-style-type: none"> Curious, entrepreneurial, open culture. Comes from Omer Mithun Curiosity as motivation is ingrained, part of DNA Sustainability = typical regional attitude Mutual sharing among firms Informal knowledge sharing Accepts and seeks out challenges Principal-driven envelope pushing Cross-team organization through physical space, anti-silo Implement best practices at own firm and for employees

	Sasaki (S)	OLIN (O)	Relativity
Design Process	<ul style="list-style-type: none"> Reactionary and deductive - Inquiries are project driven = integral to fee Data influences design. Data generated by design feeds back into loop - iterative Technology used to simultaneously design and see effects Tools confirm or deny intuition of what's actually happening, or debunk assumptions - replicable Tools provide data that team has to creatively interpret and address; the tools are inherently creative 	<ul style="list-style-type: none"> Scalable process Establish goals at project kick-off Research is done upfront and as questions arise - iterative Collect, organize, analyze data carefully Assessing performance throughout Apply existing evidence and produce new research - creativity Research ingrained in the process fee-wise, not a separate line item Evolving evidence due to cultural shifts 	<p>Formality</p> <p>← SO M D → LESS MORE</p> <p>EBD in Project Timeline</p> <p>← DS M O → FRONT BACK</p>
Implementation and Components	<ul style="list-style-type: none"> The Suite of Tools - gathering, organizing, analyzing, displaying information A library for the tools Sasaki Strategies - the think tank, educates others on the tools In-house programmers and software engineers 	<ul style="list-style-type: none"> Knowledge Base stores and shares (proprietary platform, library catalogue, projects, research, lessons learned, precedents) Education series Technology (BIM, GIS, parametric modeling, Google Fusion Tables) Theoretical Basis Group Directorship oversees evidence and application in topic area 	<p>Store & Share Evidence</p> <p>← S M DO → LESS MORE</p> <p>Internal Education</p> <p>← S M O D → LESS MORE</p> <p>Overseeing body</p> <p>← M O SD → LESS MORE</p>
Firm Organization	<ul style="list-style-type: none"> Sasaki Strategies group Cross-pollination of knowledge and tool-use between project teams Individuals are experts in many different realms outside of design = uniquely interdisciplinary team 	<ul style="list-style-type: none"> The Directorship (Research, Green Infrastructure, Technology) Research Librarian and informal research team Dispersed expertise among teams - everybody isn't required to know everything 	<p>EBD Leadership Position(s)</p> <p>← M S OD → DONT HAVE HAVE</p> <p>EBD Support/Think Tank</p> <p>← M O DS → DONT HAVE HAVE</p> <p>Design Team-Reliant</p> <p>← O MDS → LESS MORE</p>
Design Culture	<ul style="list-style-type: none"> Self-motivation, collaboration, self-assessment Non-isolated individuals An office without offices Open floorplan, work session tables Significant technological culture Analytical, turning the lens on themselves 	<ul style="list-style-type: none"> Intrinsic curiosity Investment in high rigor level Varied styles throughout the firm creating varied approaches and results Communication shift to more frequent, open, and horizontal discussions 	<p>No discerning scales</p>

	Design Workshop (D)	Mithun (M)
APPLICATION		
Clients and Client Relations	<ul style="list-style-type: none"> No change to client types, change in communication and leveraging decisions Clients specifically seek them out because of their EBD approach Public clients, municipal clients, developers, business improvement districts = need to report performance measures anyway Public clients have capability for baseline and ongoing measurement Difficult EBD discussion with residential clients - but is done anyway because it's ingrained EBD approach not a separate line item in contract. Protects but raises fees Transparency and educating the client Monetizing performance benefits is language clients understand 	<ul style="list-style-type: none"> Clients are generally attracted to the firm because of the EBD approach Clients who want to demonstrate their own commitments Clients come to them with the goal of achieving certification, its sometimes a promotional aspect Project team educates clients
Types of Projects	<ul style="list-style-type: none"> EBD works best with complex projects Streetscape and corridor projects, master planning community projects work well with EBD; easy to compare like projects too Multi-disciplinary team projects The approach is scalable to any type of project Residential projects are tough on EBD but DW is the first to have them in the LAF CSI 	<ul style="list-style-type: none"> Complex projects that push the boundaries = "Deep green" projects = need for multidisciplinary integration Tight urban spaces require elements that solve multiple issues Local Seattle and Pacific Northwest projects (unique regional codes) Projects in other locations take more educating the client and consultants Integrated architecture, landscape architecture, and planning projects
Consultants and Consultant Relations	<ul style="list-style-type: none"> Design teams end up taking the consultants through the process, educating them Getting on the same page for responsibility for evidence Consultants and sub-consultants are pleased to be part of the conversation 	<ul style="list-style-type: none"> Gravitate towards consultants who use scholarly evidence in their work Will teach other firms and consultants the process Strictly committed to working with the right consultant, no exceptions Educating contractors Also being educated by local consultants in other areas
Marketing	<ul style="list-style-type: none"> Approach is related to the brand of the firm and is marketed that way Sharing research studies and findings helps to attract projects; builds brand and reputation Clients who understand and value the approach return 	<ul style="list-style-type: none"> Known for LEED and EBD accomplishments; clients seek them out Hired from a national pool for their expertise LEED process and products market themselves

	Sasaki (S)	OLIN (O)	Relativity
Clients and Client Relations	<ul style="list-style-type: none"> Haven't changed but interaction has Clients have complex data problems (often universities); specifically seek out the firm Using the tool with the clients, useful for instant alteration and feedback When clients challenge assumptions, team can provide the visual evidence Data driven approach calms opinionated and politically charged stakeholders/clients Trusting relationship for teams to explore, test, and rework Not many Sasaki clients resist data-driven analysis, some are reluctant to depth Smaller institutions don't require full Suite of Tools 	<ul style="list-style-type: none"> No drastic change in client types Increased client expectation for proof of performance Clients looking for the built-in research and evaluation process Increasing need to tame client expectations, more data more expectations Increased hearing and sharing about what others are doing in EBD Clients come to expect performance evaluation based on rise of SITES and LEED Government bodies moving towards performance documentation Quantifying benefits or monetizing is easiest way to convince clients 	No discerning scales
Types of Projects	<ul style="list-style-type: none"> Large-scale planning benefits most from EBD approach Project types haven't changed but EBD has greater relevance to clients' needs (programming and financial analysis) Renovation projects require in-depth understanding of existing conditions Larger projects = larger data sets = more analysis required Competitions benefit less from EBD because it is more context-removed Single-phase analysis does not benefit from a cooperative EBD process 	<ul style="list-style-type: none"> Complex projects (to coordinate, understand, and document) Scalable EBD approach allows efficient use on majority of projects Efficiency and accuracy (through EBD) required as designers are being stretched thin Projects requiring certain measurements Research coincides with billable work Types of projects and types of research become one in the same 	No discerning scales
Consultant Relations	<ul style="list-style-type: none"> Close relationship because one can't be an expert in everything On-call consultants when specifying a full team isn't beneficial Addressing questions/issues as they arise 	<ul style="list-style-type: none"> Integral to the project team from beginning Evidence is the common language among consultants Consultants seen as the experts Utilizing seemingly unrelated professions for evidence/input 	<p>Integration </p> <p>Firm Educating Others </p> <p>Use of Related Professions </p>
Marketing	<ul style="list-style-type: none"> Clients seek out specifically for their ability to marry design and analysis The Suite of Tools markets itself: involve current clients, show potential clients Suite of Tools is uniquely Sasaki Marketing brochures not specific about EBD, depict decision making tools Reflections on current research trends in research tab on website has 	<ul style="list-style-type: none"> Marketplace requires accuracy and accountability of information Marketing the directorship = tangible representation of knowledge and practice) Products of research are marketable Marketing material is unspecific about EBD/research Reflections on current research trends in research tab on website has 	<p>Appearance in Material </p> <p>EBD Content on Website </p>

Figure 4.11.4 Cross-Case Analysis Matrix (Elise Fagan)

• Color and bold indicates similarities across firms

	Design Workshop (D)	Mithun (M)
PROPAGATION		
Reporting	<ul style="list-style-type: none"> • Open to sharing their process publicly • Sharing of research is for the good of the field in general • Staff will author articles • Academics have evaluated and written about them • Always presenting at the national conferences • Culbertson was one of the first practitioners showing up at CELA regularly 	<ul style="list-style-type: none"> • Attending conferences • Social media sharing • Sharing on the website • Sharing with community and industry organizations • Guenther often presents at conferences
Collaboration and Outreach	<ul style="list-style-type: none"> • Strong advocates for partnering with academia (one of Culbertson's personal missions) • Involved in the LAF Case Study Investigations • Partner with academics to do the measurement • Have returned the favor and co-authored with academics 	<ul style="list-style-type: none"> • Close relationship with regional universities; professors come and talk, practitioners teach classes • Can influence and change local code based on project findings and outcomes • Universities help to do performance monitoring • Involved in the LAF Case Study Investigations • Instrumental in the SITES evolution
Future Trends, Goals, and Fine-Tuning	<ul style="list-style-type: none"> • Still evolving the approach • Needing better baseline measurement • Practitioners needing to be better researchers • Improving sharing • Needing more and better evidence available 	<ul style="list-style-type: none"> • Practice is catching up with this model, in the future it won't be as hard to leverage • Possibilities in experimentation • More focus on human behavioral research • Need more POEs • Opportunities to leverage health • Practitioners getting grants to do research • More focus on the economics/financial aspect • More conscientious of climate change mitigation

	Sasaki (S)	OLIN (O)	Relativity
Reporting	<ul style="list-style-type: none"> Occasional speaking and publishing but not often about the Suite of Tools or the EBD approach Presence at APA and ALSA - project-related topics Occasional non-peer-reviewed publications Reflects Hideo Sasaki's reluctance to speak or publish Sharing happens through community involvement and open-sourcing Pragmatic, not generalist reporting 	<ul style="list-style-type: none"> Supports sharing knowledge because it benefits the profession, sharing shared issues too Important to build on existing knowledge Concerns about proprietary info (especially clients') Sensitive to disclosing research efforts and tools Often presenters at conferences and through webinars Fewer published reports Reaching beyond landscape architects to promote and add credibility to the profession 	<p>Rigor</p> <p>← MS O D → CASUAL SCHOLARLY</p> <p>Frequency</p> <p>← S O M D → LESS MORE</p> <p>Topic</p> <p>← S M DO → PROJECT GENERAL EBD</p> <p>Sensitivity</p> <p>← D MS O → LOW HIGH</p> <p>Reach</p> <p>← S D M O → NARROW BROAD</p>
Collaboration and Outreach	<ul style="list-style-type: none"> Close relationship to academia through Hideo's teaching, universities as clients, teaching engagements Charrettes & critiques with students Serving as jurors for competitions & awards Want to do direct research with institutions but don't have the right model yet 	<ul style="list-style-type: none"> Academic collaboration (faculty and students) part of OLIN's ethos Practitioners and academics have different motives for research but have access to things the other could benefit from - finding the point of mutual interest and benefit 	<p>Benefit</p> <p>← O DM S → FROM TO</p> <p>Relationship</p> <p>← S M OD → INDIRECT DIRECT</p>
Future Trends, Goals, and Fine-Tuning	<ul style="list-style-type: none"> Expansion of Suite of Tools into other disciplines and built-work New tools will be developed and added to the Suite of Tools (energy systems analysis, surveying methods, financial metrics, scheduling) 	<ul style="list-style-type: none"> Expanding the Knowledge Base Developing a non-profit sector to receive grants Growing the firm's expertise & credibility Better understanding evidence Improving data management Increase academic collaboration Profession will see increase in expected performance More collaboration amongst firms Creating stronger national organizations Open-sourcing tools Tapping into unrelated fields Adapting to cultural shifts 	No discerning scales

Conclusion

Findings

In studying the EBD approaches and internal effects of four leading landscape architecture firms, three significant findings emerged. First, EBD in practice is most effective when applied as a comprehensive approach addressing all aspects of the firm. Second, findings show that each firm developed their evidence-based design approach to address complex problems in design and in the profession - the processes specifically emerged to meet a need. And third, the cross-case analysis found several similarities and uniquenesses between the four firms. The similarities include: the firm emerging from academic founders, implementation of roles and responsibilities in support of the EBD approach, creation of tools to organize and understand data, design cultures to support the EBD vision, how they communicate and work with clients and consultants, and that they report their findings for the advancement of the profession. It should be noted that the design processes themselves vary dramatically across the firms.

Interpretations

This study offers several significant opportunities to the practice of landscape architecture: to further define, to mimic, and to evaluate EBD. First, in defining what EBD is to practice, the findings show that EBD practice is not just a process or a product but needs to be a holistic approach that touches all aspects of the firm in order to successfully integrate, apply, and propagate EBD. Firms looking to implement EBD in practice should not be remiss in thinking that implementing only a handful of common EBD practices will result in a viable application. Second, now that firms known to be practicing EBD have been analyzed and similarities identified, new or existing firms looking to develop their own EBD approaches can mimic and model aspects of the salient themes established in this study. However, it is important for those looking to implement EBD approaches to note despite emerging themes, the cross-case analysis shows that EBD in professional practice is not prescriptive and does not always look the same. This is evident in the unique components to the four firms and their widely different design processes. Lastly, the methodology itself provides a case study framework that other firms can use to evaluate their own EBD efforts. This study provides a much needed method by which to consistently analyze and report on firms implementing an EBD approach - if not to provide a platform for further development of such.

Skeptics of evidence-based design might interpret this study and surmise that EBD is only for firms that are big enough, or have been around long enough, or have generous budgets. Reflecting on the study, the conversations with interviewees, and the analysis of case studies; a few realizations surfaced that

respond to these criticisms. The first question is: is evidence-based design feasible in all firms? Yes. The belief is that it is possible for even small firms or firms facing overly limiting budgets to implement an EBD approach with one caveat: there needs to be external support from professional organizations to provide things like access to literature or conducting relationship match-making between practitioners and academics. The firms that are implementing EBD practices spend generous amounts of time building, developing, and maintaining these resources. Without some outside support, some firms will not be able to implement an EBD approach and maintain profitability. It is also suggested that it takes the right commitment and mindset from a firm to successfully implement an EBD approach. As it was stated in the findings, a firm cannot simply hire a design researcher and expect to have a fully developed EBD approach. The application and integration needs to affect numerous aspects of the firm's practice in order to be successful. With this sentiment in mind, it is likely that implementing an EBD approach might be more successful if the directive came from the top-down. Since a fully integrated approach needs to affect numerous aspects of the firm, decision makers really should be championing the effort. Engaging in EBD practice is less about capacity and more about the will to do so. The desire and drive to do so must be ingrained in, and supported by, the design culture at the firm in order for designers at all levels to be active and effective participants. Lastly, though EBD is most successful when applied to complex projects, where numerous unknowns require careful analysis and inquiry, any project can benefit from an EBD process. Though it may not be seen as necessary by clients, consultants, and even one's own team members; any line of relevant inquiry, collection of relevant evidence, and careful application of that evidence to make informed design decisions will most likely result in better work. The will and desire to engage an EBD process to produce that better work, must persist to make an EBD process successful.

It is presumed that the landscape architecture profession is moving towards an evidence-based design practice. Some may argue that, as complex global issues start to increasingly call on landscape architects for solutions, EBD may come to define landscape architecture. Undoubtedly, there will be practitioners who do not find EBD to be beneficial to them. The field as a whole should be wary of a schism between these two parties. To make the work and practice better for all, to simultaneously and equally build each other up, there is an opportunity for the profession's licensing bodies, professional organizations, accrediting bodies, policy makers, and academic institutions to require knowledge and practice of evidence-based design concepts. LEED and SITES are only the beginning of this effort.

Limitations to the Study

There were a few notable limitations to this study. First, only a few select people were interviewed for the case studies. The interviewees were chosen because they either held high-ranking leadership positions in the firm and could describe the evolution and the motivation behind the EBD approach; or they were members of some form of research initiative. This, however, limits the comprehensive examination of how the firms are implementing the approach holistically because it does not necessarily capture the day-to-day work of its majority staff. This leads to the second major limitation of the study: the triangulation of information required of a case study could have been stronger. Observations made at the offices and a cursory review of firm publications (either written by or written about the firm) were used to help inform the cases, but a survey of staff, in-depth observation, or participation as an integral employee could have provided an expanded frame of reference and additional points of triangulation. The last limitation to the study is the time frame in which the study was conducted. Interviews were done in one moment in time and the study therefore only represents a snapshot in time for the firm. These limitations do however suggest opportunities for future studies.

Future Research Needs

This study identified four firms that were known to have comprehensive EBD approaches at the time but the findings suggest several opportunities for future research. The analytical framework developed to assess these firms could be used to assess other firms. More case studies means more data points to compare and contrast and possibly identify more evident trends or gaps. The same methodology could be used to assess a firm not having an EBD approach as a baseline case. This baseline could then be compared to the case studies in this report. The methodology could also be used to understand what other design professions, like architecture and interior architecture, are doing with respect to EBD since landscape architecture is one part of a larger interdisciplinary call-to-action. The case study assessment could also be offered as a service to other firms or it could be used to self-assess. It was interesting to note that OLIN, during the interview with Skip Graffam and Chris Hanley, initially denied having a formal EBD approach until questions pertaining to their integration, application, and propagation initiated a reflective epiphany. Introspection could similarly benefit other firms. Another potential future study could be to take a deeper look into one of the framework categories and investigate either the same firms with more methods of data collection or include other firms. One of the four firms could also identify one of their weaker areas of EBD practice identified in the case study, develop, and improve it; and a study could be done over time to evaluate before, during, and after the changes.

Summary

In summary, this study provides a thorough examination of a significant issue currently facing the profession of landscape architecture. It also lays the ground work for future studies to better understand evidence-based design and its role in professional practice.

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Appendix A: Definition of Terms

Applied research - Applied research originates from the need to solve a practical problem and is intended for direct and immediate applications to improve real-life conditions. (The Center for Health Design 2009; Graziano and Raulin 2000)

Basic research - Originates from curiosity and aims at creating new knowledge or adding to the existing knowledge. (The Center for Health Design 2009; Goodwin 2002)

Case Study - The qualitative study of a "bounded system," with the focus being either the case or an issue that is illustrated by the case (or cases) (Stake 1995). A qualitative case study provides an in-depth study of a system based on a diverse array of data collection materials, and the researcher situates this system or case within its larger "context" or setting. (Creswell 2007)

Collective Case Study - Consisting of multiple cases being examined by the researcher. Consistent methods and frameworks are used to collect data and present each case study, often being compared or contrasted using consistent methods and frameworks. (Stake 1995; Creswell 2007)

Cross-Case Analysis - In a Collective Case Study when the researcher examines more than one case, a cross-case analysis compares and contrasts the multiple cases using consistent methods and frameworks. The intent is often to examine themes across cases to discern themes that are common or unique to cases. (Creswell 2007; Stake 1995; Yin 2003)

Data - Facts and statistics collected together for reference or analysis. (OED Online 1989)

Design Research - The procedures and techniques involved in a method of inquiry, data collection, analysis, and the presentation of the information that leads to design-related decisions (Kopeck, Sinclair and Matthes 2012)

Empirical (data) - The information that can be directly sensed (seen, heard, touched, tasted, and smelled) and is demonstrable to other people. (The Center for Health Design 2008)

Evidence - To the design professions, evidence is the "credible and defensible [proof] that informs design decisions" (Brandt, Chong and Martin 2010, viii). Not to be used interchangeably with data, evidence is *data* that is relevant and indicates whether a belief or proposition is true or valid - it supports a conclusion. (OED Online 1989)

Evidence-Based Design - A process for the conscientious, explicit, and judicious use of current best evidence from research and practice in making critical decisions, together with an informed client, about the design of each individual and unique project. (Hamilton 2007)

Evidence-Based Design approach - The EBD approach in this study refers to not only the EBD process but is a comprehensive combination of the culture, the people, the supporting elements, the communication, the reporting, and the engagement with the evidence and research in professional practice.

Evidence-Based Landscape Architecture - The deliberate and explicit use of scholarly evidence in making decisions about the use and shaping of the land. (Brown and Corry 2011)

Evidence-Based Practice - The conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research. (Sackett 1996)

Focused Interview - The researcher asks questions to learn how an individual feels about, perceives or otherwise reacts to a particular environment or situation. The basic interview tool is used as a probe which allows a mix of structure and open-endedness. (Zeisel 2006)

LEED - Leadership in Energy & Environmental Design, LEED is a green building certification program that recognizes best-in-class building strategies and practices. The LEED professional credentials program provides professionals with the opportunity to demonstrate advanced knowledge sustainability. (GBCI 2016)

Research - The systematic investigation and study of a topic or idea, based on empirical data, aimed at gaining knowledge, making discoveries, testing new theories, and applying the new knowledge. (CHD 2008)

Performance - A measure of the effectiveness with which landscape solutions fulfill their intended purpose and contribute to sustainability – environmental, social, and economic sustainability. (Landscape Architecture Foundation n.d.)

Qualitative (research) - An inquiry process of understanding, based on a distinct methodological tradition of inquiry that explores a social or human problem. The researcher builds a complete, holistic picture, analyzes words, reports detailed views of information, and conducts the study in a natural setting. (Creswell 2007)

Quantitative (research) - The systematic, scientific investigation of measurable properties and phenomena and their relationships. Emphasizes empirical measurements and theory verification. The goal of quantitative research is to explain and predict phenomena by

examining the relationships between empirically measured variables and to generalize findings and contribute to theory in which significant efforts are given to justify cause-effect relationships. (Center for Health Design 2009)

SITES - Short for the Sustainable Sites Initiative, SITES® is a program that offers a systematic, comprehensive rating system designed to define sustainable sites, measure their performance, and ultimately elevate the value of landscapes. The SITES Accredited Professional is the first credential specifically targeted to those who work and care about land and its resources, and the communities they support. (GBCI 2016)

WELL - Short for The WELL Building Standard, WELL is an evidence-based standard, which sets performance requirements in seven categories: air, water, nourishment, light, fitness, comfort and mind. The WELL Accredited Professional program provides professionals with the opportunity to demonstrate advanced knowledge in human health and wellness in the built environment. (GBCI 2016)

Appendix B: Coded Interview Transcripts

Elise: To start off, can you please describe how Design Workshop has ... what is the evidence-based design approach? The formal approach?

Allyson: Design Workshop has a long interest and history in kind of more academic practices. The firm was founded by two academics, and so the idea of collaborating within a workshop and multi-disciplines actually, I think stems from that. The evidence-based approach that we you know have, that we teach, that we try to learn from to improve the projects is ... I mean we set up kind of a clear, what we call it a dilemma and thesis for a project. You can call that a challenge and a solution or you know ... a design problem and a hypothesis, you can translate that in many different ways. We happen to call it a dilemma and a thesis, which sort of sets up the question of: what's pushing back on a good outcome, what are we trying to solve for? And then sort of posits a solution at the outset of the project so that we're not just diving in and starting to give form without there being kind of that structure to the investigation, I would say. So I think, we consider all design [to be] research in a way. You know, how credible or whatever depends on the practices that are used. We then set up a ... we have a kickoff meeting, it's called a SKO, strategic kickoff meeting. And we go through a menu of four different categories: economics, art, community, and environment. Those are the four circles of Legacy Design. And it's really about setting up like the agenda for the project. We identify goals, measurable if possible, for all the pertinent aspects of the project. And then in subsequent conversations, identify how those goals can be measured, meaning how we can set up a quantified goal that can be measured at the implemented outcome of the project. We identify strategies for each of the goals. And really kind of start to define the metrics that we're going to use to measure. So I would call that sort of ... that evidence-based approach is about setting up the agenda for what the team is going to examine. And to capture it in a way that it can be kind of looked at at different stages throughout design to evaluate design alternatives but then also, once it's been implement, look back to say, "well, okay, we say we're successful, but were we really successful? How do we prove it?" So that's ...

Elise: So you're producing evidence through metrics by establishing a baseline, is that right? And then measuring later? So that's the evidence that informs decisions?

Allyson: Yeah so, part of understanding and setting the goal in various areas is capturing the as-is condition, the baseline. Looking at other benchmarks, you know, what other similar projects are happening? What did they try to achieve? What are the city, state, county, and federal guidelines? And then what is our quantified goal that we then are trying to reach for?

Elise: And when do you think evidence-based design first emerged at the firm? When did that start percolating up?

Allyson: I would say about eight or nine years ago is when we actually started to define our own set of metrics. I think the conversation had been happening ten to twelve years ago, but then it sort of took a while to figure out, well what does this mean? And at the time, you know LEED was entirely focused on buildings. And it was, you know ... it was identifying that there was this gap and that we were very interested in being more rigorous

about understanding the successes and challenges that a project has. And using ... you know, using a process of evidence gathering to, I think, ideally look at alternatives and how they pass the test and then that helps the ... to inform the design decisions, the ultimate alternative, the preferred alternative. And then of course you have to measure that as well.

Elise: So the firm has always been based in academia and so research has always been a part of it I guess. But when ... you would say you formalized the approach about nine years ago?

Allyson: Yeah, let's see ... 2005 was the first kind of roll-out of this metrics idea to the firm. Very, very rudimentary and it doesn't really look like it looks today but that's when the group ... like a small kind of subcommittee or task force took a look at it and rolled it out to the firm at a firm-wide meeting. So I would say ... it's been eight years since then. I would think it was probably in development for the year leading up to that, so that's where I come up with the eight or nine years.

Elise: This task force, was this just a group that was really interested in putting the time and effort into this or did Design Workshop say, "here, this is what we really want you to look at"?

Allyson: Yeah. I think it was, you know the board had been having discussions and at a retreat, I can't give you the date, but at a firm-wide retreat, I would say more like twelve, fourteen years ago ... I could get you the date, but I'd have to check, it was before my time. But it was when the firm first identified Legacy Design and the four rings as kind of the direction that we wanted to go in terms of the breadth and comprehensiveness of our work. And I think at the same time there were a few board members who were really interested in this idea of kind of, how do you prove success? And that's where the idea of performance measurement came up. At the same time, LEED and other systems are starting to come into play, but landscape isn't part of that conversation. So you know, I think it stemmed from this idea of we want to be comprehensive, we want to tackle projects through these four lenses of art, community, environment, and economics; but then how do we gauge success? So I don't know if that answers your question? **Yes, that's what I'm looking for.**

Elise: So how would you say the approach has primarily evolved since that first task force?

Allyson: Well, you know, we laugh now. I think it's really ... it's amusing to think now, but we realized at a certain point, we were rolling this out and we realized that people didn't know what a baseline meant. And so you can't ... I mean it was more this, you know ... this conversation about measurement but measurement for what? Well measuring against what? And so we had to ... we realized we had to teach a process and kind of take a step back and teach people you know, what is a baseline? What is a benchmark? What is a quantified goal? How are you going to ... you know. And then you have to have a strategy to achieve that goal and you have to know exactly what you're measuring. And I think that's where Landscape Architecture Foundation has been very good about distinguishing between ... it's not just about listing features, it's about translating those features into benefits – how are they *benefiting* landscape and how is that measurable? So it's not just that we've got eight new street trees and six benches ... what are we ... what are they actually doing that's transformative? So that was a huge lesson that we had to learn.

Elise: How did you begin to teach the designers about baselines and ...?

Allyson: We ... I mean, we have six different offices and we're very connected. We had a series of what we call Legacy Design Days where a couple of people would travel around to all of the offices and it would kind of be a pencils down day. Pencils down meaning: try to shut out as best you can all the other project deadlines and client phone calls and stuff like that. And we would pick one project, so it wasn't fake work, we picked one real project. But everybody would work on it. And in terms of metrics or performance measurement, we would try to pick a project that was actually just launching. And so you know, we have a phrase around here that once the train has left the station, it's really hard to catch up to it. So meaning, once the project has kicked-off and it's off and running and the team has gone through several rounds of deliverables and deadlines, you can't then say, "well, wait, wait stop. What are we trying to do? What's the agenda for the project? What are we going to ... how do we want it to perform and how are we going to measure it?" We have to do that at the very beginning. So you know we've tried to identify a project in each office so that it was a real exercise, but everybody would work on it. And we ... a couple of people would travel around and try to teach people and develop course materials and have the conversation. And then you ... you know ... then you have to realize that not everybody's going ... the uptake is not going to be equal amongst all staff. And so there'd have to be another conversation. It was iterative.

Elise: So for a business model, to take a couple of days off and say, "nobody works on projects ..." How did that work? Would they come in later and finish the project or was this an investment.

Allyson: Yeah, it's an investment. And you know, we have symposia at our firm where ... it's less so ... There was a time where we had four a year, where we would have half-day or full-day kind of education sessions where ... and it would be near mandatory unless someone really had something major going on. Where we'd bring in outside experts. Basically it's like a design review where different projects present, different like-projects present so that they can kind of learn from each other. We bring in an outside kind of keynote speaker. So the firm has just always believed in this idea that every once in a while, you have to kind of pause and take a step back. And it's part of professional development. You know, we tell people they have to go out and speak at conferences and earn their professional development credits. Well part of that ... part of advancing yourself as a professional is the conversations we convene internally to improve the work. So we try to target it to a specific project type and then people working on those projects understand the value. They're like, "okay, wow. We have seven corridor ... retail corridor projects going on at the firm now. We should really have a symposium where we bring in somebody who kind of brings the fresh point of view." The project teams present and share information. So it's the same idea as these Legacy Design Days that ... the need to just continue learning within the confines of the firm not just at conferences.

Elise: So how do you get your designers to share in this idea, this mission? Besides making it "near mandatory"?

Allyson: Right, yeah. Some of those ... I mean certainly teams present during these symposia where we're ... you know, we ask them to present and then they gather their materials. The idea is that it's stuff that's on the boards anyway, they're not creating new material to share with everybody, it's truly what's on the boards and we're going to have a firm-wide conversation about it. With other things, you know, it's more of a day-to-day with the portal. We have an internal portal where ideally (and it's hard, it's a challenge), but teams, when they're

at various milestones on projects, the idea is to pause and think about what are we doing that my colleague in another office or a colleague of future would find of value? And to take the time to upload that to various wikis, kind of internal webpages on the portal that are topic-based. So that's one more informal way.

We have a very robust series of lunch-n-learns. Which really just require, I mean it's an hour, it's not a full day, it's not a half day. It's an hour over lunch. And we bring in outside speakers plus we have internal speakers that share topic-based projects, maybe something someone's researching, etc. So it's part of the culture of the firm, I'd say, to participate in these. And oh I'm forgetting to say design reviews. You know, that ... within an office, teams are expected to, every once in a while, get up from their desks, work out in the open space, present to others in the office. And that can happen in many different shapes or forms, either, you know, a full-office design review over lunch and there's pizza and all that or it can mean a team *really* needs the input of two people in the office and they invite them to a design review to get their specific expertise. It's ... I'd say it's part of the culture.

Elise: Can you talk a little bit about, I know you have Legacy Design Representatives at each office.

Allyson: Yeah, yeah. We've actually had Legacy Design Representatives since 2005 I'd say. So it's one of the longest running internal groups that has representatives in the different offices. And we get together monthly, it's once a month for one hour. We share articles; someone will choose an article that everyone reads in advance and then we have a conversation about it. We talk about taking the temperature of the culture of the different offices. And whether design reviews are happening and if they're not how to make them happen. It could be that an office has had a two-month dry spell and you kind of go, "well why? And how can we nudge everyone to actually practice like a workshop?" And then we figure out what the root cause is behind it and get ... nudge everyone to get going again. More recently, in the last couple years, we've actually been sharing projects that different offices are working on. So for three months in a row, we might say, you know, let's look at urban park projects. And so someone ... we usually divide the one hour call into two chunks and we get two different volunteers to share a park project. We're increasingly using the LAF benefits toolkit website where someone on the call, one of the Legacy Reps will go to ... discover a new tool, apply it to their project and then share it with the rest of the group to say, "here's how I think it was successful. Gosh you know, I understand how to use it but it's probably more for projects of a certain scale." You know, they'll kind of give their assessment of it, which has been very valuable.

Elise: Can you talk a little bit more about where you're getting the evidence from. You're talking about these online toolkits. Where else do you find evidence?

Allyson: Yeah I mean I definitely ... LAF is becoming, I would say, a convener and a compiler of information. I would say partnership with different academics, which is not as frequent. And I mean, certainly through LAF, we've had the ability to do that. But you know I ... there's a project that is just finishing up in New Orleans called Lafitte Greenway and I can put you in touch with that project team. But I know that they've sought out people at the university there to help them with some of the more, I would say, social, community type measurement. Because they're there ongoing and so they've sort of formed a partnership with folks there to do kind of have that ongoing presence and to conduct research. Whereas we're going a couple times at the beginning, we're doing an in-depth site analysis, but we can't be there all the time. So I think that's another example.

In Salt Lake City I know that we partnered ... we didn't author a paper, but we certainly helped an academic team out that was authoring a paper on children walking to school in the Daybreak community. And you know, they were basically gauging how many ... what percentage of children in this community walk to school in the community, ideally we'd like to think, as a result of the streetscapes and the connectivity that were established with the masterplan and the parks and open space. And then compare that against other similar surrounding communities. So I think it's mostly through partnerships.

We've also had a couple staff members author articles recently. One of them was based on Lafitte Greenway, the one I just mentioned in New Orleans. So that was the basis of the case study and that was published in Edinburgh Architecture Review. So it's ... we're trying to make forays into these different areas and I think it largely needs to happen through partnerships.

Elise: Can you talk a little bit about how your metrics approach affects the creative design process?

Allyson: Yeah, I saw that question. You know, I ... it's interesting I think that there are some folks that are much more intuitive about design, and I think, that design ... you know, that that's what design is. I think here we feel that you set an agenda for a project and every project has that kickoff meeting and if you're ... if the project has a certain amount of complexity, for different team members just to suddenly then disperse and go off and you know ... what does that mean? "Okay, go off and design. Go off and come up with a solution for this project." And that by gathering everybody at the beginning and setting up these clear goals and clear lines of inquiry for the project, that it actually helps the team to all get behind the same idea. And it doesn't mean that it's ... there's total agreement. I mean there's a lot of ... there's a discussion at the beginning about, you know, "what is this? How are we going to go and tackle this?" And that when the team disperses and goes back to their desks and starts to work and then they convene again, they go back out and they do their thing and they each have their different roles, they all know how they're kind of ... how it all kind of lines up with the ultimate goal for the project. So, you know, I think it's hard for ... I think it would be difficult for someone to say that that's not creative. It's just kind of putting ... in a way like a structure to ... and a clarity I think, to how the team goes out and creatively comes up with a design solution. So I think it's all about ... our projects are very complex, the teams tend to be multi-disciplinary. If you don't have that kind of agenda or structure, it's very, I think, challenging to operate as a team.

Elise: You mentioned a little bit about design culture, that that's how the designers are motivated to do this. Can you talk about design culture a little bit more and the changes made to physical spaces in the office since, you know, nine years ago?

Allyson: I don't think the offices have changed. I mean I think the fact that our name is Workshop... But this office, I've been here ten years and this office looks the same that it did ten years ago. It's got the big open spaces, the huge amount of pinup space because again the idea is that everyone needs to not just be at their desk with their blinders on, drawing or engaging with their computer. That it's about, you know, getting everybody and convening, the team conversations that, I think is where the creativity and the, kind of the synapses ... you know the synapses start to connect. And so the big open spaces, the big layout tables where teams can all really roll up their sleeves and get involved. And the huge amount of pinup space. And I think that really ... that really defines every office. There's a lot of inter-office communication and also collaboration with projects, partly

because we consider ourselves one firm, not each office as kind of a separate entity. So they're sharing resources. One office might be incredibly busy and another office might have a person who ... you know, they just learned that week that a project's on hold and suddenly we've got a person who's available. And so there's a lot of kind of pairing of teams connecting the different offices. And sometimes we physically will fly someone to another office where they're needed. Sometimes it just ... we've got all ... we've got the ability to connect through video, through web conferencing, audio obviously. So sometimes it can happen that way. So there's kind of a virtual way that the firm operates as well.

Elise: Do you think it's always been that way or has that increased a little bit more with the specific kick-off meetings and coming back and the lunch-n-learns, the symposiums, Legacy Design Days? Do you think that's actually increased or has it always ...?

Allyson: Well, certainly I think the firm-wide events have helped to model how a team with team members in different offices can use the technology to collaborate. You know I think we ... in the beginning when we started having these kind of remote gatherings, whether it's symposia or lunch-n-learns, we've had to learn some ground rules. And there was ... even picturing how the room is set up that, you can hear each other through the phone, you can see a presentation. What if somebody wants to actually draw and you know ... rather than passively see a presentation, you actually want to draw on something and show someone how to do a detail or you know, maybe the path should go this way. So using the video. And so I think that ... I guess to answer your question, that has increased because of the modeling that happens in the firm-wide event. I think teams are much more likely to say, "oh you know what ... Oh that's easy, we can just pick up the phone and get the WebX going and have a conversation." But the physical layout of the spaces is the same because I think that is so based in Workshop. And that's the idea that carries through with everything we do.

Elise: Can you please describe how project team organization has or has not been affected by Legacy Design and goals, dilemmas?

Allyson: Yeah, I mean there's ... you got your principal in charge, your project manager, and if it's a big enough project, a lead designer and various project landscape architects or planners. I think increasingly there's kind of like a "metrics champion" or a "watchdog" on the team. I don't think ever ... not every team is big enough to have that person. And so someone on the team might wear many hats. Often it's the project manager's responsibility to make sure that the different aspects of our approach are kind of baked into the process and incorporated. But if a team's big enough, they might actually identify someone. Not that that person does everything, they're just the one to kind of say, "now wait, we need to stop here before we move any further along and answer some of these questions and get on the same page." So I think that's one way.

We have a project assistant on projects and it's this person's responsibility, among many other things, is to try to capture and gather information produced by the team that potentially goes into an awards submittal in the future, or goes on the portal because the team did some ... did something, found some really amazing information, an article, they produce something that really should be put on the portal so that everybody has access to it. Otherwise, you know, you have teams ... I mean there's ... The shame would be that if we don't share the research and somebody in Denver learns something wonderful and somebody in Austin next year starts on a very similar project and has no idea that the team in Aspen actually already went down that path.

How can they benefit from that?

Elise: Okay what about firm organization beyond the project team? Has that changed at all?

Well there's me. I am directing the initiative. So the DW Legacy Design which is inclusive of this idea of performance measurement. So the fact that I have a firm-wide role in addition to working on various projects. So I've been here ten years and work on projects but also this firm-wide role that is about the teaching and the sharing and getting everybody excited. The learning that has to happen to keep it alive in the projects. The fact that we've got Legacy Design Representatives. And so there's representation from each office.

We did at one time have, what we called Forum Leaders. And we didn't ever hire all four to represent art, community, environment, and economics. But one idea very early on had been that we would have like a firm-wide lead for each of these areas. And they would be this expert and they would teach everyone and they would bring in speakers and get information on the portal and kind of sprinkle their knowledge amongst different projects. And I think that that was ... I mean the idea was flawed. It's a great ideal to have but the fact is that, I think the projects tend to be much more, sort of generated by a team and the knowledge needs to be generated by the team. There's ... also the economic downturn hit and so it was, you know ... we ... you know probably not the most successful idea to be hiring a specific person who has this knowledge but isn't already embedded in projects. It was more of a top-down. Whereas now I think the expectation is that all the teams are tackling their projects comprehensively and there doesn't need to be a firm-wide expert in environment. Each team ... there's sort of an expectation that whatever there is to learn and whatever there is to know out there, you're going to go seek it or you're going to go generate it. If that makes sense. Because I think that that shows some evolution of just how the firm decided to approach this.

Elise: Can you please describe what impacts you have or have not seen to specific project types or client types over the years based on this approach?

Allyson: I don't know if there ... I mean to the types that the ... the type of work we get? That comes in the door?

Elise: Does is work better on certain projects?

Allyson: Yeah well you know, it's very interesting that we're working ... our three projects with Landscape Architecture Foundation are residential projects, that's what our three projects are this summer. And when we first went on the LAF website, when one of the deadlines was approaching to submit project proposals, there were no residential projects as a category of the case studies. And I thought, well is that because they don't want any residential projects or the scale's too small ... I mean was it a scale issue or whatever? And it turns out just nobody had ever submitted those or proposed those. So we thought, let's see what happens. And I think that it's been a more challenging discussion in some ways with our residential clients. I think it's ... it might be a scale issue. It's been easier to have conversations with like municipal clients or business improvement districts who, as part of their operation, need to report on how something has performed. They ... The residential client doesn't ... I mean they might want to know how it helps their energy bill ultimately, so there's that interest. But I would say some of the public clients, the developers, the business improvement districts who have already ...

they have a mandate to report. They need to ... they want to know. They want to know how their project is performing and so they're all over this idea. So does that kind of get at your question?

Elise: Well going back to the residential clients, have you ... you always do a metrics ...?

Allyson: Not always. Not always. There just doesn't seem ... I mean I would say sometimes we just do it internally anyway. But the clients don't seem as interested in it. And I don't know if it's just because they ... I think they're interested in seeing energy or water bills go down. But there's been less interest in an overt process. That's definitely one thing we've learned in ... I think when we first started this, it meant a metrics exercise might have been a separate component of a contract. And it was kind of called out and I think we're learning that for ... frankly as we're getting better at integrating this process into our work that it's better just simply have it be part of our process rather than call it out as something separate. Because then it's seen as something separate and has a separate fee or line-item that a client can say, "I don't want to pay for that." And so it's kind of like not even giving them the option anymore. Yeah, so I think, you know Kurt Culbertson, who you're talking to tomorrow, he even mentioned that the other day that, you know, it's interesting, as we're just sort of incorporating this into scope, it's less risky that it's going to get ... it's going to be on the chopping block.

Yeah, there was one other thing I was going to say ... related to project types ... Oh! We've actually gotten a couple of contracts where, even though our firm was not the lead consultant (and this is actually one of my projects), we were one of I think sixteen different consultants and a sub-consultant to an engineering firm, a transportation engineering firm. But because they knew that we have this system for leading a team through an exercise to figure out how to be ... how a project could be more sustainable and how to measure it at the outcome, they actually hired us, in addition to being the landscape architect on the project, we had a separate scope to lead the entire consultant team through the process. So that's sort of the opposite of what I just told where in that case it was a completely separate section of the scope and the fee. And this was for the City and County of Denver. And in this case, you know Denver has a performance ... an environmental performance initiative called Greenprint Denver. And so they wanted to know, kind of as a pilot project, how this project was going to align with the broader city environmental, economic, and social goals. And so we took the team through our process and then showed how they kind of dovetailed with what Greenprint Denver's objectives are.

Elise: So this has almost brought on new jobs and a new marketable niche?

Allyson: Yeah. Yeah. I don't ... It doesn't happen that often that, separate from just "we want you on our team as a planner or landscape architect, that could you lead the entire team through this process?" But it's happened, I'd say half a dozen times in the last few years. So ... which is ... it was very exciting. Because what it meant was, first of all, they're recognizing the value of the project going through a process and there's interest in performance. And then also, it was nice to be recognized as, "we know your firm is doing this, will you do it for all of us?"

Elise: And you had all of the sub-consultants and consultants participate in that dilemma and thesis?

Allyson: We went through an exercise, the dilemma and the thesis. We identified all of the different topics in our four categories that relate to the project. We went through the dot exercise to prioritize because of course

there was many more things selected than could be reasonably tackled on the project. And then we had a matrix that tracked the goals, the strategies, what actually was being measured, who was responsible – we’ve learned that’s *incredibly* important especially when you’re working with a multidisciplinary team; it’s one thing for everyone to just to feel like, “oh yeah, that would be ... oh yeah that’s definitely one of the project goals.” But who is actually responsible for taking that to the finish line, is something else entirely. So yeah, who would be responsible for ongoing measurement was one thing as well. Okay this gets built and it’s a city streetscape, well it’s done, we all walk away, who’s responsible for going back to actually ... determining how it’s performing?

Elise: And did you find that the non-design disciplines were receiving this process well or is it hard to get them to think that way?

Allyson: (*moves her hand and head in a ‘sort-of, sort-of’ fashion*) It was hard to get them to think that way. And I think it’s because the client was asking that is ultimately why they were all on board. I think it was forcing them to go through some different processes whereas they might have just [said], “well but this is the way we always do it.” “Yes, but we need to take a step back and ... is there a different strategy that we can use? Can we put something in the specifications or tell the contractor to do something a certain way so that there’s a different outcome as far as where materials are sourced or recycling of materials on site, or you know ...” Any ... I mean ... There’s probably fifty different things that we came up with.

Elise: Okay talking about clients a little bit and their ... being their own advocates for this and ... How do you make the evidence-based design approach profitable with ...? I mean, you said you don’t really give the clients an option anymore. But to spend so much ... so many resources and time to put into this ... how do you make money off of this?

Allyson: I think we see it as related to the brand of the firm. The ... how we differentiate ourselves. Of course we’re thrilled that other firms are practicing this way because ultimately that’s better for the work itself, the earth, society. But obviously we wouldn’t be doing it if it ... we didn’t think it was beneficial to how we’re perceived and our ability to win work. I think there are times when it’s ... not every hour is billed. Certainly in the beginning ... and do you know the four sheets I’m talking about [referring to the DW Legacy Design metrics selection worksheets covering environment, economics, community, and art]? **Yes.** Okay, I just wanted to be ... So in the very beginning ... ‘in the beginning’ (*laughs*), I would say 2005 to 2007 or right around that time, teams would get together some of the early exercises where we had these sheets. And we would go ... I mean you’d hear of a team going through item by item and having like the long debate and discussion about each item and after eight hours in a room, only getting through, you know, I’m just going to throw it out there, community and economics, or environment ... And obviously that’s not going to work, right? Because part of design and being in professional services and figuring out your fees is learning how to be creative, methodical, rigorous, but also efficient. You got to figure out efficiencies in what you do. And so we’re now to the point where that initial team conversation can take an hour. Because we’ve learned a way to send out those sheets beforehand. The team’s supposed to come to the table with a point of view. And we lead everybody through an individual exercise, a group exercise, and then a prioritization exercise where it has to ultimately match the scope and the fee of the project. You know, if it’s a 16,000 dollar fee, (*laughs*) you can’t be looking at fifty different things and trying to measure. It just ... it’s not possible. And so there’s much more focus and I think comfort level with scaling the effort to the scope and the fee. Now I also think that we’ve learned and there’s

efficiencies in the fact that everybody's now done this, you know, however many times on their projects. So that *huge* learning curve and the days in the conference room of the very beginning, you know, everyone is much more comfortable with the process and it goes more rapidly. So that's ... I mean I could think of other examples where ... We use the word scalable a lot; it has to be scalable to the effort at hand. But we're also a very devoted bunch and I think there are probably times when a team really wants to tackle something on a project and the client's not entirely behind it and we probably have it be kind of a secret hidden agenda that we're ... (*smiling in amusement*) that we're trying ... that we're interested in pursuing something for the benefit of the project, that's going to make its way into the project. Now could we point to exactly where the client is paying for it? No. But that's kind of what we as ... not 'we' as Design Workshop but 'we' as an entire design community, we want to do the thing that's right for the project. So I'm ... I don't think you can always draw a line from ... well this part of the fee paid for this and ... you just can't.

Elise: So you might get down to just a few metrics on those lower budget projects?

Allyson: (*nods*) Mmhmm, yeah. Yeah, I think that you have to because ... And so what you do is you go through a prioritization exercise. And by the way, I should say, we are *all* about these conversations with the client, this isn't just us as the consultants in a room ... I mean sometimes the client *truly* isn't interested. So we use our approach as a way to align the team and set the agenda for the project. But we always ask. I mean, to us, the idea of workshop in being ... is being inclusive and transparent. And so inviting the other sub-consultants, and they're usually *really* pleased to be a part of the conversation. Inviting client, or at least coming to the client to say, "we went through this exercise and you can see that we ... we're all over the place, we've circled all these things that we thought were relevant to your project, but here are the few we came up with that we think are the priority." Or we always tell teams, "either have a direct conversation with the client, go to their website -- often companies or universities, they'll have their stewardship goals or their mission on their ... it's public. Either have the direct conversation or do the research to understand your client and how our sense of what the sustainability goals should be for the project dovetail." So I just want to be clear on that. This isn't about us like cooking up something and knowing what's best for a client, this is very inclusive.

Elise: Have you found that with a more reluctant client, you start doing this process and come to them with these metrics and evidence, are you able to kind of turn them?

Allyson: Yeah, definitely. Absolutely. And in fact, a staff member just told me about something the other day where they were not getting ... they were getting signals from a client that they weren't really interested in ... the client's probably thinking, "well, is this extra? How much?" And they brought sort of the messy results of the exercise, the team exercise, but it also then had been put through the sieve and the priority goals for the project had sort of made its way to a more clear matrix format, where they could see ... And then we showed how they ... you could draw a line from each of the things we identified that should be researched or performance areas on the project and how they matched what their ... the company (it's a developer), what their stewardship goals were. And so they go, "Oh wow! You totally get us. You understand us. And you're right, we are in the business of recording outcomes. So this makes sense that the design consultants should do the same thing that we are, you know, our quarterly shareholders are expecting to hear measurable information and what the outcome of something is. Yeah, this is great." So I think it's partly educating the client as well.

Elise: Okay so you talked a little bit about the portal and how everybody is supposed to share their knowledge through that. Can you talk a little bit more about that and any other ways that you share knowledge internally?

Allyson: Yeah, so ... I'm trying to figure out where to start. So definitely the events (and I'll talk about the portal), but so the events are you know the symposia, we don't do Legacy Design Days as much anymore, it's just sort of that was the beginning of this initiative and with the economic downturn, we just were like, we don't need to be putting people on planes, especially when we were able to prove that we can have these remote conversations, and we got better at that too. The lunch-n-learns, the symposia, the design reviews where people and projects are expected to pin-up, that kind of thing.

So the portal, you know as the vessel that contains the information – it's about knowledge sharing. Whenever I do ... I do an orientation for any new person at the firm, and I emphasize the need to not just make withdrawals but deposits. So that's part of their entrée into the firm, that this is about pausing and understanding when you've encountered some information or generated some information that would be of value to a colleague either immediately or in the future, figure out a way to get that on the portal. Like any firm, or at least I'm assuming, we have the email blasts to the entire firm of, "hey I just found this great website, this great link." Or "oh gosh, I just came across this fantastic article, everyone should read it." And there's still sometimes the disconnect of: "you know what, you need to get that on the portal. Don't just send out the firm-wide email" and then people either follow the link and read the article or delete because there's so much information in life (*laughs*) – spam in life. But trying to retrain people to get that on the portal. So I'm the nudge who always replies back to that person and says, "did you consider getting this on the portal? And if you don't know exactly where it should go or you're forgetting how to do it, you can talk to your Legacy Rep ... so that there's someone in their office, and I'll copy the Legacy Rep. So the portal is only as good as the information that's on it and it's ... I think like any company with a website, you have to make sure it's current and relevant, and so that's part of my role is trying to make sure that good information is always going on it.

Elise: And what kind of information do you have on there? Do you have articles? Literature that might be interesting? Do you have the raw data from project studies?

Allyson: Yeah, we're trying to figure out more and more how to get the project information up there. It's one of the reasons that for the last couple of years, the Legacy Reps in our monthly calls, we've been sharing projects so that then the idea is that we share it amongst our group, they each go back out to their office aware that that project has happened, that the project has undertaken this type of an agenda and it's got this type of inquiry is going on. So the idea is that it's not just finished work, it's work in progress. And then what they're supposed to do when they present it to the Legacy team is to get it on the portal. And so that we have examples of projects, of a wide variety of project types but also at different stages, not just the complete, here's the final deliverable but actually here were the tables that they used to capture the wind speed on site, that was monitored on site. Or here we collaborated with another consultant to figure out where the snow drifting was going to be happening. And so to get that information on the portal so that ... I mean my goal is: in the academic research or exercise you do a literature review or you want to know what else ... what else is out there that's been published so that you understand the context of your inquiry. And I think designers have always said, "well, let's look at precedent projects and let's gather images and do a image precedent board." That's sort of what we used to do. And now I

think what designers need to do is do the same kind of article search, whether that's articles, websites, and what other projects have done as benchmarks.

Elise: Do you share the metrics matrices for each project on the portal?

Allyson: We don't currently but we have ... we've spent a lot of time on making sure that every single project's project folder on the folder, on the server, is set up exactly the same way. There's a lot of training about where you put certain things. And so there are spots for where those things are supposed to be located. So ideally in the future ... I mean even if that project gets archived, it still stays intact, it's whole folder structure. So in an ideal world, and I think it does work pretty well, you want to go find, "gosh I know that project presented and did this research on this. And I need that diagram and the backup data that goes with it." I know where to go rather than ... Now it relies on people having the same kind of brain mapping, like the way their brain thinks and so ... there might be the random person out there who just likes to squirrel stuff away. And then you go, "ugh!" (*motions with her hands on her head and laughs*) You know? But ideally people are using the structure. And we probably have training on the folder structure twice a year and it's part of any new hire orientation. We have a few people who are very passionate about the folder structure (*laughs*). Which always sounds so boring but then when you think about like, your colleague can't ... I mean you don't want everybody to understand each person's individual brain and how they would think, "oh well this goes with that, no I'm going to put that there." You want it to be really clear. So if it's not on the portal, which I'm trying to increase what's going up there. I also don't want the portal just to be a replication of what's in the folders. That's kind of why we as the Legacy Reps talk once a month and it's kind of like, those projects are kind of ... are kind of percolating to the top as good examples and then those are going on the portal, not everything.

Elise: So to go beyond the firm, how do you share knowledge and evidence with the field?

Allyson: So definitely the LAF case studies; which, I mean, what they're doing is amazing and the idea of pairing firms and practitioners and academics and the students who are ... have their feet in the academic door but most of whom end up on the practitioner end. I mean, it's really great to think that very seldom can firms pay for their, or take the time for their own kind of post-occupation, post user surveys and stuff like that. And we've done a little of that but I think we see this ... this is a huge opportunity. The other great thing about it is that I feel like the students who are working with the academics end up graduating and end up at these firms. You know, so they're graduating, they're getting their foot in the door, and they're coming with this knowledge that we've tried so hard to teach people that in ... you're always going to have a case of old dogs needing to learn new tricks. Well these are the new dogs coming in, the young dogs, and they've figured out ... they know the tricks, they're coming in with that knowledge.

So the LAF case studies are great. Certainly ... what am I thinking ... Oh, presenting. We're ... Our firm is very big on the idea of presenting at all of the national conferences: APA, ASLA, CELA. I think Kurt Culbertson (and you should ask him tomorrow), was one of the first practitioners showing up at CELA regularly. And he's been getting his PhD at University of Edinburgh. But I think he's all over this idea of bridging these gaps.

How else do we ...? The portal's internal but if we have information on the portal, then certainly we're bringing it to bear on our projects and that might mean that there's different consultants that are benefitting from that.

We're also like, if we work with a traffic engineer and they have a particular study about crosswalk distance or speed in the ... car speed, vehicle speed and the fatalities; we will ask them if we can take that study that they referred to and put it on our portal. So I feel that ... ideally it's not about, (*motioning as if she were covering work with her arms*) "well this is proprietary and this is our thing." It's about making the work better.

Elise: That is what I run into a lot of the time: Design Workshop seems to be just open to sharing and I mean, you have your metrics sheets published in LAM! And you go through the process in that WAR articles.

Allyson: Oh the World Architecture Review. Oh well that's ... yeah, I should have mentioned that as another way that we share knowledge. And I mean, that completely ... I mean a few of the articles are all about how we operate. And then the reason we invited others to participate is we thought, well if it's just us (*starts to laugh*) writing about ourselves it's too much navel-gazing. We actually invited these three academics to actually ... and we said, "we want you to be critical, we want you to give your outsiders' opinion." So that's one more way we're trying to share information. And in that case, it's with a Chinese audience, the World Architecture Reviews will be published in China.

So then the four principles of Legacy Design, the I would say guiding principles are the comprehensiveness, so the four circles looking at all the work through those four lenses. Inclusiveness, meaning ... I mean even if you look at the way our offices are set up, we've got a principal next to an intern and the person who answers the phone at the front desk can probably tell you a fair amount about how we operate and different projects. We're very transparent and inclusive in our conversations. So I think that that ... The fourth one is the idea of measurement. But I think that idea of inclusiveness and transparency extends beyond, it's why we want clients and consultants to be part of the conversations and cooking up the solution for the project obviously. And I guess it goes along ... this idea of the publishing and speaking at conferences and ultimately it's to make the work better. Obviously we want to be successful as a firm but I don't know that by sharing, being pretty open about sharing our processes, it's not ... we still have to go fight for work and prove ourselves. And another consultant has to do the same. So they're aware of what we're doing and how I think we still have to go form the relationships to get the work, if that makes sense. So we're not too closeted about our approach.

Elise: So you seem to have everything figured out, you have a really good solid approach and you're sharing knowledge to advance the field and you're teaching your designers the right approach. Where do you ...?

Allyson: I wouldn't say we ... I mean I think we're on glass half full approach, that's the way we are as opposed to glass half empty. Although we're always trying to be better. And it's a process. We're ... I think we're constantly teaching ourselves how to do this, what the efficiencies are, how to be more rigorous, to use the credible research. There is one thing to do like a site visit and just kind of generally capture what's going on on the site, it's another to go and set up monitoring tools and ... We have the measurement tools backpack and I don't know if I mentioned that at all but people can check that out. We've got tools related to wind speed, relative humidity, temperature, speed (like for looking at traffic speeds nearby), what else ...? Tree caliper measurements, sound, noise levels. So and I think that's a place where there's a lot of interest in having a more in-depth, advanced site visit that captures a lot more information and maybe over time to set up some monitoring over time to understand: well, what is that baseline condition? And then to figure out how to go back in the end. It's one

thing through the LAF case studies that I think you hear when you're on those webinars that the academics are saying that the baselines aren't captured. So they're being asked to partner with the firms and do the studies but the baselines aren't captured! And we're guilty of that too. I mean when you're looking at a project that was built eight years ago (*shakes her head*) ... no, we don't have the information. But what we're learning is the importance of having information. So I would just say we aspire to doing the best we can but we're all, I mean I say "all" internally but "all" profession. Across the profession we're all learning.

Elise: So what would you like to see happen? You say more rigorous data ...

Allyson: Yeah, I think that that would be ... that that's definitely one thing that we're I think learning how to do is to set up the project like it's a research project. And so that's where I say, "the train can't leave the station until you've set up certain control ... or just set up certain systems." The same way that you're coming to talk to me and having me sign a few things and you've got your questions all prepared in advanced. If you just kind of came and started having your interviews without having any sense of, "I'm going to ask every firm the same questions so I can compare," you wouldn't have nearly as organized and clear an outcome. So I think that's where we just simply need to keep getting better at making sure we have that SKO, making sure we have that initial conversation. Or if we have it that we have it early enough to really inform the direction of the work.

Sharing more with each other on the portal. It's easy to just always be on to the next deadline and not stop to make sure you're sharing content. And that's where I hope that the champion on the team or the project assistant can be that last resort if others aren't thinking to share the information. But even then, I'm sure there's a lot that doesn't ultimately make its way into a public space within the firm.

I think we learn a lot by working with the academics. You know, Jessica Canfield and Bo Yang and ... They ask good questions. I think they're much more rigorous about the way that something should be set up before you park. (*laughs*). So you know that's where the intuitive designer [says], "oh I'm just going to know it." And this is a form-giving exercise and that's where this is bringing a whole new level of rigor but it also helps to shape that approach, the intuitive doesn't go away but this is sort of this foundation.

Elise: So what would you say you need from academics or the field to really advance yourself as a firm and to advance the field in general?

Allyson: Well certainly, just simply more partnerships. I think that the three people who worked on the residences working with Bo Yang and his students this summer, they learned because they see what questions are being asked. So just more partnerships would be great.

I pulled some information for you that I can give to you, but if you read Kurt Culbertson's articles in LAM about research and measurement. Just ... He gets calls with some frequency from students who are in search of a thesis topic or a dissertation topic and they want it to be something relevant to practitioners. And I mean they don't want it to just go on a shelf and not have anybody pay attention to it ... Or have it change the way practice happens. So they're looking to the practitioners to say, "well what would be helpful? So I'm not doing this from my academic standpoint but not understanding how it translates." So I think that that's certainly ... those types of conversations would be helpful to the profession.

But just internally ... you know it's interesting, at Landscape Architecture Foundation on the board there's been some discussion of ... there have been cases where the practitioners think the academics know how to do all this measurement and they know how to set up the research and obviously very rigorous and they have certain practices that they're held accountable for. But they don't know how to measure everything. There's some things like the social, community type of benefits that LAF has really been pushing this summer that a lot of the academics have said, "we don't necessarily know how to measure certain aspects of the site or conduct, you know, obviously they know how to conduct surveys ... But I could get you some of the specific questions, they're not coming to me right now. Where ... What LAF is realizing is that they might need to figure out how to provide some training to the academics as well on how to conduct certain types of studies. Yes we're saying that we want the studies to tackle the environmental, the community/social, and the economic, but they're ... what are the best practices for those lines of inquiry? And so I think that's where we're all learning about this together.

Elise: I asked about giving an example project, do you have one in mind?

Allyson: I have a few. I think Kurt is going to be able to help you with some of those very specifically that he worked on. I printed some of the projects that the Legacy Design Team had talked about recently, which I'm happy to give to you. And then Kurt, you should talk to him about Lafitte Greenway. You should talk to him about Lincoln P Street. I mean he can certainly ... this is an older one but he can certainly talk to you about South Grand. And there's definitely a lot of streetscape and corridor projects which is where I'd say we've made the most advancements because we've just kind of pushed it on this particular project type and ... With Lincoln P Street (and I think it's actually in here), even the way that we're representing the baseline compared to the goal or baseline compared to benchmark compared to goals. So you'll see that, in this document, there's like a little info-graphic that, in addition to the written content, that itemizes those things. There's actually a little graphic next to it and there is for every single thing that the team looked at. And I think that that helps to have the conversation and make the case with a broader constituency whether it's client, or going to community meetings and explaining, "this is what the traffic speeds are now. Here's what we think they should be. Here's what the crosswalk distances are. Here's your on-street parking situation. Here's what it took ... here's what you'd expect. Here's what the lane widths are. Here's what we're proposing." So in addition to the words that go with the ask or the proposal, there's the graphic that can help to tell the story . So take a look at those. Because we're feeling like that has been missing and the way that you represent your performance measurement, your goals are really important.

End

Interview conducted by Elise Fagan

Date: July 16, 2013

Location: Phone Interview

Duration: 0:35:07

Elise: My research seeks to understand how firms are formally integrating evidence-based design into the design process and how that has impacted the firm. And I have identified Design Workshop as a leader in the field of evidence-based design for using scholarly research and evidence to inform design decision-making. And I'd just like to hear more from you about how the approach has been formalized over the years and how it started and how that evolution has impacted the firm's practice.

Kurt: Well, I would say that it is in part about growth of the philosophy of Legacy Design, not entirely in the sense that Legacy Design is the idea about taking balanced and equal look at issues about economics, environment, community, and art. And then out of that philosophy is, I guess has been added to the notion of measurement and providing evidence that you've achieved the objectives that you were set. So it starts with that philosophy and expands the questions of evidence. And then we have, specifically as it relates to evidence, further refined to the idea of establishing metrics about informal process ... more formalized process of measurement to provide that evidence. So evidence could be anecdotal or evidence can come from interviews or surveys or things of that sort. But we've moved a step further I guess. Generally we think of it in terms of measurement of different types. It has been further formalized and that the process has been led by an individual Allyson Mendenhall, which you're aware of, in charge of that. And there are continued ... There's Legacy Design leaders in each office to further, kind of help to try to communicate the intent. And so it's a philosophy behind it and there's a bit of an organizational chart, organizational structure behind it to support that. And then somewhat further supporting that is the notion of the five-year plan, which is a series of educational milestones that each employee is going to try to achieve. One in which would be LEED certification, LEED is certainly a measurement-based kind of process. So it's philosophy, organizational structure, educational expectations. As it relates to projects, projects ... all projects are to have a ... should be a kick-off meeting. They ... that happens, I think with a fairly high level of consistency, although every project starts in that way. And what should be part of that kick-off meeting or shortly thereafter is a process of identifying how we would measure success and what kind of metrics might be applied to achieving the objectives that are set for the project. So there are, within a project management structure, some specific steps that are ... anticipate to be taken to try to formalize that process as well.

Elise: Can you describe how evidence-based design first emerged at the firm?

Kurt: Well I wrote a memo to the partners probably ... I could get you the exact date because I have it sitting on my desk, I'm not in the office at the moment. But probably thirteen years ago now, that suggested the idea that what gets measured gets done. And that we develop a process of measurement. And so I would say it began with that. And it's proceeded from that to some specific project examples, and those project examples have begun to give us some internal models of even measurement. So that has been helpful. And it's just been an evolutionary process over the last decade or so. And it has been helpful in that we have had some project types like highway corridor revitalization studies for example where we now have applied this question of evidence-based design and measurement to multiple examples of similar project types. So we can begin to compare and contrast what works and doesn't work against similar kinds of projects. So it's been a long-evolved process in simple terms.

Elise: So what sparked you to write this memo thirteen years ago?

Kurt: Well I think when we got to the question of legacy-based design and the idea of looking at community, economics, environment, and art. I knew from a business management point of view that we had measurable outcomes as it relates to economics. Economics ... performance of a business, the economic performance of a real estate development project are traditionally evidence-based. You have financial performance, you have very clear ways of understanding whether you've succeeded or failed at something. And so once we evolved this question of Legacy Design, the question was, "well how do we know ... how do we know if we succeed in these other areas of performance?" The idea is trying ... about trying to see ... to think offensively and achieve some verifiable outcomes. How would we know if we've succeeded from a community or an environmental perspective? So that was part of it.

I think the other item that triggered it a bit was ... about 1990 I started working on Canyon Forest Village down in the Grand Canyon. And a number of the people that were involved with that project or at least been exposed to or associated with, the emerging Green Building Council, LEED didn't exist quite at that point in time and so began to understand this idea of measured outcomes and performance-based design from some of the people that were dealing with that. And we actually took that thinking and expanded it to apply to our model and move beyond just environmental-based outcomes and measurement.

Elise: So when would say that the approach was formalized into what you ... what Design Workshop has established as the metrics and matrix and setting a dilemma and thesis?

Kurt: About ... 2005 or so.

Elise: And what sparked that? Why was it realized that a formal approach was needed?

Kurt: Well I think that it's to implement the philosophy and then you need to find a way to make sure you've implemented comprehensively and that you're not simply depending upon people being ... dabbling in the idea. That it was a fundamental philosophy that is driving the firm, we needed to know that it was being applied consistently across the board and that required a little bit of education and commitment to make it happen. You couldn't talk ... you couldn't put it in an environmental perspective, you couldn't green-wash the situation by talking the talk but not walking the walk.

Elise: And how would you say the approach has primarily evolved since ... in the last thirteen years or so?

Kurt: Well I think it's begun to pick up on them in part because of this question of measurement is more widely being accepted by the profession. I think that you are finding academic programs with more of a research orientation than they've had for quite some time. And so you have students that are coming out of school who are familiar with this notion of measurement or the idea of research and much more comfortable dealing with it, maybe than past generations. And they're coming to expect that kind of intellectual rigor to be brought to bear on problems. So I think that it's probably changed or evolved in the sense that it's being more broadly accepted. It's still a long way from being a universal model of practice. There are a handful of firms that I think that are serious about the question of research and evidence-based design beyond something like ... something

like LEED or Sustainable Sites. And you could probably say that the growth of LEED and the development of programs like Sustainable Sites contributes to us. That people from ... working through ... with those programs are more familiar with that kind of philosophy as well.

Elise: So what changes have been made to Design Workshop's approach to make it more efficient and profitable as far as your business model?

Kurt: Well I think some of the ... in the recording of knowledge, the portal and the recording of tasks, research efforts where people can find that past work a little more easily. I think that helps. I think just repetition. The fact that we've taken a number of projects of a given type and people have worked with it quite a bit. I think that is beginning to make it more efficient. You know, it's taken a lot of this to get baseline information, you learn about some of these things.

Elise: And how would you say you get your designers to share in this ideal? How does it become part of the design culture? Something that they are willing and excited to partake in?

Kurt: Well I'd say it still remains somewhat uneven. Some offices, some individuals have simply not addressed it. They find it too intellectually demanding, too ... too much a demand on their time for them to address. I think a lot of people just from experience have found that the work's gotten better and their interest in detail has gotten better as they've plotted their approach. So I think part of ... a big part of what has gotten people focused on it more is you know, success breeds success. They've taken an evidence-based approach, they've been able to measure outcomes, they've found that being able to measure outcomes has allowed them to more ... to go more deeply and specifically as they've explored ideas and it makes them want to do it again.

Elise: Can you please describe how the development of Legacy Design and the evidence-based design approach has or has not changed firm structure?

Kurt: I don't know that it's changed firm structure specifically. I'd say that in and of itself I think that we continue to evolve the role of information technology to be more of ... or IT, to become more of information management. So not just about hardware and software but the storage and retrieval of information. I think that is a little part of that overall process. We have continually tried to design, incorporate and improve upon a quality management function which is not something that a lot of ... certainly not a lot of landscape architecture firms have done. So evolving the role of quality management is directly related to being more precise and going deeper with the data and the research. It's shaped some existing roles in a clearer way. But I don't think there's been a whole reordering of the way the company is structured to accommodate it.

Elise: Who's in charge of the quality management?

Kurt: Well I'm actually in the midst of ... we have had quality managers in the past and that has succeeded to varying degrees. Those ... their roles were really built more around construction document and design review, quality review, etc, etc. I think that now we are ... I'm actually in discussions with Allyson about evolving what has been more of a research function for her into becoming more of a quality management role. Trying to make sure the research is actually working its way into the next project and doesn't always end up being ... you want

to make sure it doesn't end up being sort of a post-construction evaluation only, right? You got to look at it ... you got to be able to see how it translates into better projects every time, right?

Elise: Have you seen a change in the types of clients you get based on the approach?

Kurt: No, not so much. But I will say that I think clients are very ... we found to be very interested and accepting of the idea of evidence-based design. They understand the idea of performance in general because they're interested in financial performance. Financial performance, the idea of measurement is understandable to them. So they get that and it's an easy leap for them to understand measurement from an environmental or community perspective. I think there's also been an emphasis in this process on monetizing benefits. So if you have water conservation or energy conservation, being able to describe how – (*technical difficulties*). What I was going to say was I think that clients understand the benefit of monetizing information right? So if you can say, “we're conserving water or we're conserving energy,” and you can translate that into financial savings or financial benefits for them, they get that as well, right? So the idea of monetizing these items is also of value to them.

Elise: You don't see any specific types of clients being reluctant whether it's the small-scale residential design clients or the corridor design? Any one type of client that's ...?

Kurt: Well I guess actually ... we're actually doing ... I mean I guess one other thing that strikes me is we've also been engaged now for the third year in a row in the Landscape Architecture Foundation Case Study Initiative. So I think that some of the research that's accompanied that is also helping drive evidence-based design. And we are actually working on residential case studies right now. And I think those are the first residential projects that have been done of the Case Study Initiative. So you know I ... we're testing out how value ... how valuable residential clients to be right now. I would tend to say that's never really come up. The primary concern is, “is my project on budget? Does it look beautiful?” And so they may or may not have environmental concerns to varying degrees. And generally community concerns are not an issue in private residences.

Elise: Have you found that if you come to a residential client with evidence, are you able to turn them to see a different way?

Kurt: Well yeah ... I don't know that we've specifically approached them with evidence, you know? In part you know ... In Aspen, the county and the city's green building code leads you toward a metric-based approach anyway. So ... because you have to measure your performance against city regulations, right? But that's a slightly different kind of evidence-based approach. You're really doing measurement to ensure that you comply with the regulatory environment not because you're trying to improve environmental performance or economic performance on site.

Elise: Are there any examples of projects where evidence has leveraged decision-making significantly in a client?

Kurt: Well sure, yeah. I mean I ... we've done planning for a master planned community in California. And the impact of earthwork savings and water savings in New Mexico and Utah have had some pretty profound influence on decision-making.

Elise: Well I'd like to move on to a little bit of a larger scope and talk about how Design Workshop's approach is affected and how it influences the field. So first of all, do you ... I know that you share a lot of research with the field whether it's you writing in LAM or the World Architecture Review articles that Allyson sent. I guess my question is, why are you so open to doing this?

Kurt: Well I think that ... part of it is just for the good of the order. We consider it valuable to try to help improve the profession. I think that it helps build the brand and reputation which I think is beneficial in attracting new hires. And I would say that there are clients that find the information ... find the approach to be valuable. And in that regard to prove to be a leader in the field, you're ... we believe there's some positive financial – (*technical difficulties*). I was going to say that the ... You know, I think we do this in part for the good of the order. There's a general belief that it's a way of contributing back to the profession. I think in part there are ... it helps build a brand which is useful in recruiting new landscape architects who are interested in the topic. And I think there are clients who have legitimate interest in performance-based design and to the extent that they can be recognized as a leader in that regard to ... (*inaudible*) . All of those things.

Elise: Where do you go from here to continue to improve your approach within the firm and to improve evidence-based design in the field?

Kurt: Well I think that in-firm [it] is to take the research that's being done and to continually focus on how it's going to improve the next project, that it doesn't become research for research's sake or measurement for measurement's sake. That we can convince ourselves and that we're confident that it's leading to better projects. I think continuing to monetize results so we can communicate to clients in a way that they understand, that it's having a legitimate economic benefit for them whether we're pursuing community benefits or environmental benefits, but it helps to be able to monetize it to communicate to the client that it's... translates into funds for them. And I think getting better at measuring things. Many of the things, urban heat island for example or air quality improvements and so-forth, a lot of the things we would like to measure, we simply don't have the expertise or the air quality mechanisms now to make sure we can actually do those things. So you know it's ... Jim Collins would say it's a Flywheel Effect: it's just improving everything little by little and making it better.

Elise: And I know you're a strong advocate for the relationship between academia and practice. Can you touch on that a little bit?

Kurt: Well I think that one ... a good example of that would be the Landscape Architecture Foundation Case Study Initiative. In theory, academics are trained researchers, they know how to do research well. And so there is the potential for an objective third party relationship where academics may do post-construction evaluation or review our own work or conduct new research to validate whether the kinds of design interventions that were ... come to bear actually yield results. And that may be better accomplished by partnering with academics than trying to generate the research on our own. So I think for all of those reasons we've been trying to create these partnerships arrangements.

Elise: Allyson mentioned that you would be able to talk about Lafitte Greenway and how that ... how the approach was applied to this project from beginning to end?

Kurt: Yeah well I think that we ... we established a series of metrics over a wide variety of project ... of baseline measurements. We took the time, in as best we could, to gather the baseline data. I think that there were some ... (*inaudible*) examples for tree canopy for example and its impact on urban heat island etc, where we used those baseline metrics to cross-check the design to see if we had actually achieved what we set out to do. There's some other examples like urban wildlife where we may not in fact do the ultimate measurement but we've created a baseline condition that would allow other academics, academics or others, over time to measure the performance of design over time and see if we achieved what we set out to do. So in those ... part of the objective was actually doing real measurements on our own to see how successful we were; part of it is about creating a baseline condition where others can measure the success of the project over time.

Elise: And I have the packet here that Allyson gave me, so I've been looking through it a little bit. What year was this completed?

Kurt: Well we're going to bid next month. The plans you have in front of you were adopted by City of New Orleans Planning Commission in May. So yeah. It's quite recent stuff.

Elise: But it has gone through all of the ... you've gotten all of the baseline data for this?

Kurt: Yup. Yes.

Elise: And just a question generally for my sake, how many firms do you think practice with a formal approach? What do you ... In the field, what percentage?

Kurt: Oh boy, I wouldn't even describe it as a percentage. Probably ten or less.

Elise: And what do you think is the main block that firms are not able to, or do not want to use a strategic approach for evidence-based design?

Kurt: I think that ... I think that firms have a hard time operating profitably in the first case. And so they probably don't understand how to put the extra time in to do research without it negatively impacting their financial performance. I think that's part of it. I think part of it is landscape architects in general are not good trained researchers (as are people from any field). But you know, I don't know that people have the fundamental educational background to do great research. And I don't know that the benefits of doing research and evidence-based design have been demonstrated to people. So it's generally, "jeez, I'm having a hard enough time operating profitably as it is, now you want me to do research and deal with evidence-based design too?! And I don't really know how to do it even if I wanted to. And how am I going to do that ... I'm not trained to do it. How am I really going to use this? What's it going to ... how is it going to benefit my project work?" So it's quite a few things.

Elise: Well would you say that with the graduating students, who are trained in academia, they come to a firm with that knowledge, is that not enough?

Kurt: Well they ... I think they have varying degrees of research capabilities, depends on their own educational

background, and the firm they came from, the school they came from, etc etc etc. Their challenge is they're not that experienced in actually doing the work. So you know, the challenge is they now have to figure out how to do the work better to then be able to understand how they might apply these research skills they learned in graduate school. So on the one hand you have people who know how to ... they know how to practice but they don't know how to do research and on the other hand you have people who know how to research but they don't know how to practice (*laughs*). So you're trying to develop a rare combination of folks who have figured out how to do both.

Elise: So how would say that Design Workshop has been able to be so profitable with your research approach?

Kurt: Well sometimes it's just people putting in the extra time because they're interested in it. Part of it is, we have done a fair number of projects where we've not been that profitable but we just worked at it. And so we're getting better at it. With highway corridor projects, a lot of the baseline principles are how to measure certain things. We've had practice and we know how to do it, so it gets faster as we go. We know... we know how to look for ... where to find the kind of data you need to know: find accident data or find crosswalk timing data or to find traffic data or etc etc etc. Part of the problem is just trying to figure out where to find the information.

Elise: Right. And Allyson had also mentioned that you've moved from a time when that research portion was maybe an extra line item on the bill for a client and now it's integrated right into the process.

Kurt: Yeah. I don't think at the end of the day you're going to get a client to pay extra for that. I think it's just going to have to be integrated. You're in a competitive environment and so if the client is shopping prices, it can't be more expensive, you're going to have to offer a research-based approach as a value-add. Yeah. And you get this kind of approach, this kind of data brought to bear.

Elise: So they obviously ... clients are valuing that research enough to pay the extra money for it as compared to a firm who would not.

Kurt: Yeah or they see the outcomes getting better right? You know, they see a quality outcome and to a certain extent they may not care how you got there but if you ... if they understand that maybe research was part of the puzzle then they see the benefits.

Elise: Okay. So then you have return clients I'm assuming?

Kurt: Yeah.

End

Interview conducted by Elise FaganDate: July 18, 2013
Location: Mithun office; Seattle, WA
Duration: 1:23:00**Elise: Can you please describe Mithun's evidence-based design approach?**

Christian: Well I would say it varies from project to project. It very much is a project-based sort of, it takes on a lot of different forms based on what the project is requiring and what kind of roles we have for it. In an ideal sense, you would want to integrate; you would want to figure out baseline information about a site, about a community in advance in order to inform our decisions, design decisions. And I think, stepping back a little further, our overall approach would be sort of, almost like a mutual feedback pattern using evidence and also design intuition together at the same time and having them respond to each other and having them work off each other throughout the entire process. I guess one extreme would be where you're only using science and evidence to make decisions and another would be only using design intuition to make design decisions. And we're trying to kind of try to find a balance between the two at all of the phases of the project and so we're using evidence, evidence to inform design, we're trying to be creative and use our own intuition as well, and then working off of those two throughout the process. So that's sort of the bigger picture of what we're trying to do.

When it comes to using evidence to inform design decisions, it takes on – I guess I could get into some projects but maybe we could hold off on that. We sort, an ideal we would have, we would use evidence as a baseline to make decisions when it's possible, and it really varies depending on the project.

Elise: When is it not possible? What are the limitations to that?

Christian: The biggest challenges are lack of information or difficulty obtaining the information. The other big challenge is simply time and money and willingness of the client to find out the information and how it might impact their particular bottom line as well. So the trick in a lot of cases, the client is not coming to us with a goal of using metrics or using an evidence-based approach. For us to incorporate it in there, we need to either sell it to the client and get them on board or we need to find a way to incorporate it into our projects and make it affordable for us and them. So that in a way some, in my experience so far and what I've seen, requires, although we have an idea of how the two things work with each other, evidence and design, or intuition, or whatever, requires a bit of sort of improvisation with each project to kind of figure out how to implement it based on what the client wants. And I can kind of speak to that on kind of a public or private side I've been involved in, but it's a wide variety from like using a lot of evidence to really having to push the client to figure out a way to integrate what the clients know, particularly on whether they're in to it or open to it.

Elise: We'll get to that a little bit later. What I'd like to do is kind of still build this foundation. So you say it differs between projects, is there any kind of step-by-step process? How do you, besides knowing that you have to somehow include evidence, how do you ensure that that is happening?

Christian: In my experience, our first step is to take a look at the existing sort of metrics systems that are out there as a means of kind of framing the project, so LEED, SITES, what else? There are several others: Enterprise

Green Communities, Salmon Safe. Taking a look at all of those as a framework to work with, that would be like a first step for us. Out of curiosity, are those metric systems part of what you're considering evidence-based design or do you think that's something separate? **Yes, that's certainly one form.** Ya, so we would use one of those as a starting point. Obviously like LEED in an architecture firm is pretty well institutionalized already – maybe five, ten years ago that wasn't the case, but now it's pretty much standard and clients are looking for it. SITES will be a new thing where we have to kind of sell it to the clients that they would want to do. Various other metrics and tools are kind of just, well for instance Salmon Safe is a more of a regional Northwest kind of approach. So that's sort of where we might go through and use those as a way to go through a checklist and understand what we might be able to achieve on the project. Look at SITES, we're using it both to determine whether we're applicable to something like SITES or LEED and whether we can go after it at say the schematic design phase. But we also use it as kind of a means to determine what we might be able to achieve on a project as our own internal firm goals. And usually it's pretty helpful to use tools like that because it's already pretty well established, the framework is established and it's kind of a great place to start. And then based on the project we might go in different directions and we might feel the need to kind of go into more depth and go into kind of creating more of a unique process. An example I would probably want to talk to you a little bit about would be this project, actually a project we did in Denver, a healthy living community in South Lincoln area near the light rail station down there. And that whole project was based more on health metrics in a more holistic sense including environmental, housing, including landscape, including urban design of the site. And we decided in that project to use health as sort of a framework to kind of integrate evidence into the design process. And so in that case we had a framework that was in existence to help impact assessment which was already a protocol being developed. There was healthy development measurement tools based in San Francisco Department of Public Health and we kind of adapted that to the needs of the project, to the timeline of the project.

Elise: Can you give me an example of how you adapted it?

Christian: Yeah, well the first thing we did was make it a lot shorter process because what we realized over time was that the process of something like the HIA which is currently more of a practice by public health practitioners and officials, or academics, takes a lot longer than a lot of development projects allow. Development projects tend to be, in most cases, a lot more fast-paced in academic research tract in the projects and so we needed to kind of streamline it and make it something that would fit within the timeframe and the development. If the client wants to get something going in six months then we have to do it in six months, we can't take the normal eight months or twelve months that it takes. So we streamlined the HIA and kind of customized it to our timeframe. And then from there we took it several steps further to kind of customize it even further to further integrate HIA into kind of reorganize so it's more useful to designers and developers and practitioners and figure out ways to kind of better integrate, kind of get better feedback integration between policy, academia, and to some respect practitioners. And that project was fairly recent in that, that's probably the farthest we've gone in evidence-based design and evidence-based work at the firm.

Elise: So how did you make it more applicable to designers?

Christian: That's a good question. I think the first step was really streamlining the process as I mentioned before. A I mean that's one of the biggest hurdles we have in using evidence-based design. In my experience so far has been that you just have a limited amount of time to gather the information, to implement. And we also,

there's also sort of a translation period where you have to translate all of this work that is done by the public health officials using public health jargon that makes it understandable to the layperson or to the designer who's using their own jargon. So in effect we're trying to do, to streamline it, and kind of figure out what was the most, what were the most useful metrics, that would, that could both be beneficial as far as quantifying our impact but also could be actually achievable by designers. And so we could streamline it to a smaller number and also to the types of metrics that could actually be affected by our work. And then also we sort of translated another step towards taking it more out of the theoretical, sort of ideas of sort of say health determinants such as sort of healthy or unhealthy housing built environment or number of ... amount of open space in a community. We wanted to translate that into language that designers can understand and react to.

Elise: So going back to talking about LEED and SITES, are you going through this list and picking out things that you want to use in those specific metrics? Is that how you develop the goals? Or are you using the framework for SITES and LEED to develop your own goals?

Christian: It's a little bit of both. We usually early on, once in the schematic design phase, we want to know whether, from practice, we want to know whether it's achievable to get LEED certification or SITES certification. But also it's typical for us to first do like a certain level of design work and analysis and client workshops and to get an understanding of what the scope of the project is, where it's going first. And once we understand sort of the client needs, what the community needs, and we understand the site and the conditions; we then... we start doing a little bit of the early preliminary programming and design work, we start to kind of, we usually kind of take that approach first. Then we take a step back and assess where things are at compared to SITES and figure out what are the initial ideas... what of the initial ideas will help us towards the certification or towards those goals. And then we might look at, oh well we had... there's this, this, and this that we're not quite meeting. Is there a way that we can actually incorporate that into the project? For instance, a project we worked on in Dallas, we... you know SITES is pretty strict, so we need to look at like meeting certain stormwater goals, certain pre-development goals. Some of our initial designs weren't going far enough and so we needed to kind of push the stormwater thing a little farther with clients and consultants who are not very, compared to a lot of projects in Seattle, are not very... not as aware of stormwater management best practices. So we just take a step back and kind of figure out how we would want to integrate that into the project if consultants are in the loop, and try to achieve those goals where as ... so ... It's a little bit of both, we usually start off with more of just, more of iterative design first and typical design process first.

Elise: Is there ever a time when you come up with a goal that's not met... that doesn't have a SITES metric to it. A lot of the neighborhood planning is very hard to get into SITES. Do you still ... I guess ... go after that goal and design to that?

Christian: I would say in general, yes. We ... in a lot of cases, especially since SITES is pretty new and it's a big factor, we just operated under ... for landscape projects we've been operating under whatever we can get from LEED. So a lot of the stormwater, things like stormwater management, soils and whatnot, have been more based on our internal process. And that's driven a lot by Deb who's very involved in SITES, I mean she's been pushing that for a long time. Plus there's a lot of special restrictions in Seattle; for a project like Taylor 28, we had a lot of interesting amount of stormwater approaches. A lot of that is driven by the local regulations that might not apply in places such as Dallas or Union Square.

Noelle Higgins enters and introductions are made.

Christian: So we're just talking like big picture stuff. About how we sort of ... we were kind of talking about it at the beginning of projects and how we decide like what our goals are for the project and when do we use things like LEED and SITES. And do we start with SITES and LEED or do we kind of come up with the initial schematics and then decide how ... whether or not we can achieve SITES with those schematics and how then are we falling short, how we can improve those things. And I was kind of talking a little bit about my current experiences and I'm sure you've have had several other experiences too.

Noelle: Ya, well and I mean sometimes – you've probably covered this – but sometimes it comes directly from the client, it's their goal. Or the city or public agency. They have a goal: all buildings have to be LEED silver, gold, platinum.

Christian: Ya we were just talking about how local Seattle organizations' values about stormwater may be so different then say, Dallas or some other place.

Noelle: Right. Regional codes will really affect what elements, and climate. Have you guys talked about like the Landscape Architecture Foundations? I mean I have buildings that are ... teams that I'm working on where the buildings ... some buildings are Green Building Challenge, I was writing down ... we have some buildings that are just Built Green, which are sort of just like "LEED light". We started to look at the civil scale, at the system that's local here called Green Roads. So it just depends on the scale really, the project. Usually we end up with projects where people want to use one of these systems because it's something that's our practice. There's some expense involved in it for the client.

Christian: Do you think that we ever, something that we were kind of talking about is like do we ever set goals internally that are outside SITES or outside any of these certifications or are we typically using them as sort of our framework to move forward most of the time.

Noelle: Ya, I looked at your first question and I think that, you know, just generally that our evidence-based design is based on, you know, best practices that we have in the office too. Or, you know, lessons learned from previous projects and so our goals are for what is standard and what other offices would consider very low-impact development projects. So it would be different from their standards. So our goals start at a very high green level in this office, and in other firms around Seattle too. And that's not true in other parts of the country or where people are not building in that way. We have lots of projects in Nashville where we're sort of educating the engineers and the townships, and you know, the state about what has been done in other states and why it's okay. Because there's sort of a ... there's always this learning process. I'm doing a case study right now on a project in Pennsylvania, Chatham, for the Landscape Architecture Foundation. Part of our lessons learned is that if you're trying to do something that hasn't been done in your state, it's ... there's an expectation ... you kind of have to set the expectations for the client that they're going to have to ... there's going to be hard work, there's going to be questions that are asked; if we were doing it here, wouldn't be asked because it's just accepted practice. And there, the state is asking questions, the township are like "we don't want to do that". Or the local community don't want wind power in their area. You know, so there's like ...

Christian: Sometimes the hardest, or the ... not even the client but the consultants you're working with who have never done it before. And it can affect their fee to learn this new the process. And so there's kind of a balancing act as far as ... and community members not being able to learn it as well.

Noelle: Or have kind of a particular bias against things because they haven't got a very sophisticated understanding of what that is or they don't ... I mean, we're always looking at sort of cutting edge things and so they may be better, smaller, quieter than what people have read about. So people have ... inherently have an human nature to be reluctant to do something that's different than ... if they've heard a negative thing and they don't know anything else. Deep green projects take more energy from a design team. So you ... And they also take more time. And I think they take more energy from the client. And so it can be a little ... you have to work with the client to help them along. Even if they're really sophisticated and very engaged, this is there total goal, it can be really hard to keep ... because the processes are so long, to keep everybody involved ... So, you know, some projects we tried to get to ... we've tried to get from black water to potable water, we couldn't do it in the state, or they wouldn't let us. They were going to force us to do chemical processes which would basically ... it would nullify all of the work we had done before to do things in a biological process. So there's things that we think are goals when we start and they're just not possible, but you don't know until you get in to it. There are things that you don't realize are goals when you start and you just assume and they become a really important factor that somebody buys in to .

Christian: What was the black water, potable water? Was that part of one of the certification processes or was that like a higher ...? Was that like a Green Building Challenge?

Noelle: No. The Chatham University project, which we've done multiple phases on, it's under construction – the first phase under construction right now. The client really wanted to do ... to deal with black water on site ... doing that, doing all of the black water constructed wetlands. But the goal was that the ... from the black water to potable water, was the whole ... and that just wasn't possible because the state wouldn't ... it wouldn't approve it without us doing the sterilization process that was chemical. And at that point you're basically ... everything you've done up to that point was just ...

Christian: ... might as well just do it the chemical way.

Noelle: Right. So it's ... I mean that's a decision particularly for a client ...

Christian: So that was client-driven though?

Noelle: Well the state drove us to that.

Christian: I mean the client that process, the actual higher level sort of sustainable design feature but couldn't achieve it?

Noelle: Yes. They wanted that and they didn't want ... the state required a certain ... the state required the chemical process and they didn't agree with that philosophically. So we just changed the end goal for water. It's still black water, it's all treated on site, but it doesn't get to a potability level. Which is ... I mean it's used

for irrigation, but it's not ... the state had very strict rules about how we use that water. So we just never could have anticipated that because there'd never been anything done in that state before to that level. And we have a consultant who specializes in that work. And so ... it was ... they were very very ... they had done a lot of projects all over the country and internationally and they were very surprised. So it's like, you know, there's things you can't anticipate. But it's still like a very very green project.

Elise: So would you say that you set most of your goals in the schematic design phase? Whether those are achievable or not. That's kind of what I was getting from you is that you have to kind of dive in to a lot of the analysis and you get thinking about the design ideas before you start really setting those specific goals.

Christian: We have a lot of projects especially any that are building-related that kind of automatically require LEED of something – it's a given. And it's going to start early on. It's a project where there's ... the client is not 100% on some certification or another like LEED or SITES then it might require us to kind of ...

Noelle: ... steer

Christian: steer it along, ya. And then if it's ... In my experience, it seems like most of the time we try to get going on it in the schematic design phase and it seems like we've generally ... towards the beginning but at the same time I don't feel like we ... we're not driven by the checklist.

Noelle: No.

Christian: Usually the checklist comes in as sort of ... it's a way for us to kind of check on our work, what we try to ... kind of are thinking about it more from a design perspective from the beginning to kind of figure out what are the best solutions based on the site analysis, what the client communicates to you.

Noelle: And sometimes it's true ... whatever that certification is that they want, whether it's LEED or SITES or any of the other green building things, that'll come from a client because it'll be a marketing opportunity. How they're going to market their project, how they're going to fund it. And so it may even be before ... like it won't manifest itself until we get to schematic design exactly how we're going to reveal that in the site or in the building. But it'll come before we even start the project and sometimes you have to sort of counter-steer. And sometimes it's based on more of city requirements or state requirements or if it's a public building. You know, so it ... it comes from a lot of different directions. I think we're very fortunate in that our projects usually start at that level. We haven't got many projects – at least on our landscape team – that start as being like a, just a shell building that has no sustainable features at all, or doesn't look at daylighting, or you know, natural conservation. You know, so we just generally don't really – in this office – don't really have that ... we don't really have to start by educating people when they step in the door. There are a couple of projects like that in the office I think, you know but ... very small when you're looking at other offices or other firms in the country.

Elise: So it sounds like where you get your evidence is mostly coming from baseline metrics that you're measuring an initial stage and then post-occupancy evaluation. Is that correct?

Noelle: There's very few projects where we have a fee for post-occupancy evaluation. I think that we would

love to do more of that work, generally, in our field. It's just really ... especially now in this economy, it's really hard to have a fee to do that. I think there has been some projects – Deb will be able to tell you, that she's done that had that as part of their contract. But most of ... it'll be post-occupancy in the way that it'll be learning best practices from a previous project. And you roll that into your specifications and drawings. And that's just professional development stuff. You know, this is what we figured out works in this climate, in this zone, or this particular ... whether it's, you know, bio-retention or green roof. So we ... so that's really how we do, I think – and this is from my practice in my previous office too – is that the way that landscape architects do post-occupancy as compared to previous states is by learning from previous projects, especially when things that are on the edge. We did a lot of greenroofs and so some of the first in this region so there's a lot of lessons learned to keep going forward. So, you know, you're sort of testing to try to make ... you don't want it to completely be a risk at first but you try to make the best decisions that you can with the designs that you have, and with the ... Also working with maintenance people in terms of how they're going to maintain things. You know, if they don't have the equipment to maintain things or they don't have the budget to maintain every plant, and you need to design so they can have other ways of maintaining it or doesn't need a lot of maintenance. So, you know, it's like ... it comes from lots of directions but the post-occupancy thing is very hard because it's very late.

Christian: We've been having a hard time ... like with these LAF case studies – even that's difficult to go back and kind of look at the project in hindsight and gather the information that you need. It's been hard.

Noelle: Ya, because it's time consuming.

Christian: And it's sort of just on the side for us. It's not part of every project budget or fees, so it's sort of side research, an academic sort of effort that's kind of like volunteering in a way (*both laugh*).

Noelle: Ya, we want the information ...

Christian: Ya for our own ... because it does benefit us.

Noelle: Right.

Christian: And then ... I guess, you know, another challenge I've noticed when I was doing those LAF case studies too is that even if a project has been involved ... has done some of the SITES, some of the LEED type work, it doesn't necessarily mean it's going to be easy to go back and look at that project and find out all the data that led to getting the certification. You need to get the square footages of stormwater, the square footages of native plants, I mean ... A lot of times that stuff is just not very readily organized and available. So it takes some digging, back into consultant folders ... looking for some data that ... some drawing the civil engineer sent to someone that worked in the office eight years ago. Even though the project might be LEED certified and the boxes are checked off, that data – the actual raw data – is not easy to come by .

Noelle: I think that's also true because the scope on a really different team, where you have a really green building, has to sort of overlap. Because it's not like the mechanical engineer designs an air-conditioning unit and you know, it's like in a box. You know, so it's like there's like ok, what trees are we putting outside to help it shade, where are the vents ... where are they in relation to the landscape? Or is there any issue with pollen?

Where are the main windows of the building because of solar on the building, or what are they doing for shading? You know so it's like there ... it's when it's a ... the greener the projects get, the more integrated it is. And so that makes it even harder to put it all together. (*Christian nodes in agreement*) You have to sort of understand that that's part of the process.

Christian: And we do a lot of projects our landscape ... the majority of the landscape projects are integrated projects, so it's never just a landscape project, it's very common.

Elise: So if you're not getting a lot of this data until afterwards – or you said it's hard to find – how are you using that to make design decisions? So, say your goal is to reduce stormwater runoff by 20%, are you doing alternative modeling to figure out how much different designs are producing stormwater runoff or are you doing the calculations for this through online calculators per se. How do you go from that goal of we're going to reduce 20% to making it happen in the design?

Noelle: All of those things. (*Christian nodes in agreement*). There's modeling happening and a lot of the modeling for stormwater, for instance, would be civil engineers modeling it. But we'll, you know ... we'll ... there's also like all of the program for the site. So you have ... it's like any design, it's just our assumptions that are a little different to start. You know, we assume this park ... we sort of figure there's going to be this much square footage that will have to be rain gardens. So within the sight we have to provide a completely accessible path, we don't want any ramps, we want everybody ... you know, we want it to be universally accessible AND we want to deal with ALL the stormwater off the site and deal with all the stormwater on the buildings. So you start to, you know ... you start to sort of divide the site up and then you have to ... it's back and forth, and it goes through the whole process, all the CDs, and through SD, through all the way to 100% construction documents. You're always sort of tweaking it. There IS modeling, but as the buildings change and then the model changes ...

Christian: ... it's varying levels of modeling. I mean we sometimes it would be ... it could, depending on the scope and size of the project, it could be much more intensive and much more in-depth. But sometimes it's simply for modeling or anything like that, it could be much more ... just sketching out and doing some rough calculations and ...

Noelle: ... test fit.

Christian: Ya. And we kind of have to draw on the experiences of other people at the office and what they've been through and that's sort of benefited the bigger office and the bigger team. And you know, we can ask people what kind of successes we've had with different types of soils and bat ideas around. Another big challenge on some projects that we have or hear that are landscape projects that are related to stormwater ... Really every ... we might have evidence from other projects, but every site is so different when it comes to soils and drainage. And you know, what might work in a typical condition in Seattle, and then you go to a site – for instance we have one up in North Seattle where it used to be like a wetland in Spring and very poor draining soils and all of a sudden you really have to use a totally different ... a completely different system and amount of soil to use but also like construction of it and creating the ... and making sure the soil is put in and not compacted after the fact by crews and all those things that can really impact various senses of draining the site ...

Noelle: And that's the thing I guess I missed is that all the way through construction, it's not just through CDs but it's also working with the contractors who have qualifications and have done grading projects before and they understand the expectation, they're not going to park their JCB on top of roofs that may have trees or ...

Christian: ... or compact all the soil that's supposed to be in the stormwater ...

Noelle: ... clean their paintbrushes on the tree roots ... (*both laugh*) or you know, walk around in the bioretention area.

Elise: So, you gave the example of: we need so many square feet of rain garden, so how do you figure out how much, how many square feet? Where are you getting the evidence to decide that? And you said a little bit of that is coming from knowledge with previous projects and other designers around here. But how do you decide that and then double check it to make sure that ...?

Noelle: Well we're always double checking. But like at SD we would ... we're ... usually stormwater we work really closely with the civil engineer and so we would you know, we would develop a design, a site design that we think is the beginning of what will work and works for the program and for the client needs. And then we pass it to the team and say, you know ... and we would sort of probably get a square footage of what they think and obviously it's cubic feet so square footage is just a starting point. But we get a square footage of what we think we'll need, we'll do grading that we think might work. And we'll pass all of that to the civil engineer to model, review, and you know ... and their pass is like, "okay it needs to be this much bigger, this much deeper or we can't get inverts." You know, so it's like back and forth iterative process ...

Christian: ... through all phases ...

Noelle: (*nods in approval*) ... through all phases. And if you can get ... hopefully you can get a lot of things sort of resolved in S.D. and then develop further in DD, and figure out products, and then try and work ... figure out what your budget is and where the you hold matter or the remediation center ... But you're basically checking it all the way through. And as you get ... as you get closer and closer to one hundred percent construction documents, you're like ... you know, you're checking like "ooh that doesn't really work because there's a tripping hazard there and how are we going to resolve that?" I mean it's like all the way until the drawings are out the door. And then even when they're being built, you're getting questions from the contractor, and they're thinking "that's not going to work, you know, necessarily." Or something changed because of a V.E. surveying (value engineering) so they have to build something a little differently than you were anticipating and there's not enough drainage, or they didn't put in the right material near the grades so there's some draining you weren't expecting, or the survey may have been a little off and so ... "oh you've got ...

Christian: ... trees and utilities ...

Noelle: ... there's a highpoint somewhere, you've got utilities where you want to have trees. So you know it's ... that's the process. You know, and I think it's the same if it's a really green ... I think it's very complex when it's a really green project but it's the same ... we use the same process, which is ... have different ... we just have different things that we are ... think are a rule of thumb, "it's a rule of thumb, we're going to have

raingardens everywhere.” So you know, we just know there’s going to be areas that are graded for that ... and you know this ...

Christian: and there’s situations where it’s beneficial that we’re on like an integrated team with ... where we have like both, when we’re working on a project with architects and we have a little more wiggle room where it’s not everything is ... can be passed through the ... and worked with the landscape itself. Especially when we’re programming dense projects where we don’t have a lot of room. There’s been cases of projects, a number of where ... you know there’s some sort of balance between the landscape, things like raingardens, but also cisterns and putting them on the structure and figure out where they’re going to integrate that so we can have a balance between absorbing ... making ... meeting our stormwater goals, both with the soil and the raingardens and the landscape, but also structures, cisterns, and integrating within our building too. So that’ll ... that’s ... can be helpful. It’s ... but it ... it does become very challenging and tricky because you’re ... you know, you’re basically coordinating between like five or six other disciplines to make something like that work: structural engineers, mechanical, civil ...

Noelle: So maybe you have to move a wall and you know ... well those will affect the calculations for this berm that went in for stormwater, and now we have to figure out how to get this square footage back, you know. So it can ... I mean it’s, yeah ... And everybody on the team needs to understand that ... like who’s doing ... who’s really ... who’s managing that part, and who understands that, so you don’t make choices that are going to have very expensive costs ...

Christian: So it may be just as simple as like, say there’s an underground parking garage and someone else is tinkering around with that parking garage, and it could significantly impact, you know, like where the cistern is being located. I mean this is not even a hypothetical ... (*both laugh*) it’s happened on multiple projects. They’re all competing for space underground. So yeah ... it takes a lot of coordination, absolutely.

Noelle: ... lot’s of coordination.

Elise: Just to get a basic idea of how this has evolved, how long have either of you been at the firm?

Noelle: I’ve been here two and a half ... two years and four months.

Christian: That’s it. I’ve been here two years roughly.

Noelle: I was at four years at another office that ... we have similar projects. Deb has been here seventeen years or something ...

Christian: ... probably a couple hundred years maybe (*both laugh*). Yeah Deb’s been here a long time.

Elise: Okay. Have you seen any changes in the way you approach designs using these metrics in the two years, roughly, that you’ve been here?

Noelle: Well, I mean I was using the metrics in my previous office too. I think it’s sort of standard practice in

this region for landscape architects that are working on these kinds of public buildings and to use the metrics or understand the metrics. You know, there's some things ... you definitely are ... I mean it just depends on the project, but I don't think so really ... it doesn't really ... you're educating yourself continually to balance those metrics with the goals. But that's why we have to keep educating ourselves, because we're really broad fields.

Christian: Yeah, I think definitely ... make sure to ask Deb that question because she's been around this firm and the field in general long enough to ... LEED's been pretty well-integrated here for five to ten years at least.

Noelle: And I think ... I think maybe longer ... but I think she's been really instrumental nationally on working on the SITES. So and then getting it integrated into projects here ...

Christian: What will be interesting is for us is ... the bigger difference will be like ... since SITES is pretty new and that's going to be something that's going to impact our discipline a little bit more as time goes on. But we haven't really ... I haven't been on any projects where we're going for ... this Dallas project might be one ...

Noelle: What, SITES?

Christian: Yeah SITES.

Noelle: And we have ... and Chatham is still doing ___inspections?___, doing what we have and designing this ... various phases so that we could if that's what the client wants. There's a cost involved so ...

Christian: So I think that'll be a ... that'll be an impact that we're going to see in the next five years with projects.

Noelle: I think that ... I mean even if people don't go for that certification, that we do sort of try and understand what those parameters so we don't design something so they can't change their mind. Whatever that certification is, whether it's Green Building or SITES or ... I mean LEED frankly ... the SITES comes out of the fact that LEED didn't really ... it's very limited. So you know, LEED's pretty ... I mean not that every point is easy to get but LEED is ... it's not huge ... it's not as much work for us as for other disciplines. It's more ... you're integrating ... some things are wastewater points and ... but it's not ... it doesn't ... it's not difficult to make ... to get those points in a lot of our kinds of projects. It might be difficult in, you know a shell building ...

Christian: So more integration using SITES would probably you know ... over time it's going to ... it's going to become more difficult for us in ... to get certified with that. And will lead to probably more effort on our ends to keep track of that.

Noelle: I think the reason ... the ... on the flip side of that though ... like LEED and SITES and even the Green Factor that we have here in the city that Seattle has, are tools from our discipline to say, well we ... if we want ... you know if we'd like to get this factor, if we have to get this for Green Factor then we have to have this many trees. You know, things can't get cut out of our budget later on and things get integrated into our project early on and assume that it's not something that's a VE-item possibility. You know, so it's good, they're all good to help us to sort of protect our budget and protect our ... and protect the integrity of the ... the design of the project necessarily. But there are also ... there are also challenges. But there are ... especially like Green Factor

with urban sites locally here, you know, that really helps you to make sure you get ... you have to have this many trees, or you have to have this much site, you have to have this much ... you have to have a place for people to park your bike. You know, all of those things that are ... that are kind of add-ons when somebody's got a very tight budget and it protects ...

Elise: Let's talk a little bit more about clients. And you said you had a couple of examples of when clients are all-for-it, hands-on, and when they really are not willing to pay for this kind of research, commitment and time. Can you talk a little bit more about those examples and what you've experienced with clients?

Christian: Well I mean, it's just ... one of the projects I'm on that's down in Dallas, where we were still like kind of looking at SITES and LEED ... Well it'll be LEED for sure, I'm not sure about SITES but ... The client's fairly willing. But their angle on it is less ... like Noelle was saying, like a lot of clients do LEED for the promotional aspect of it, you know like... it's for marketing and whatnot. But this client is more like ... they're more about ... they're approach is more like this ... "let's just do the right thing and whatever's most efficient," and they're less concerned about promoting themselves as sustainable or anything like that. So they have a different outlook. I mean, it's respectable in some ways and ... But it means that they're kind of weighing the efficiencies and economics of it and the practicalities of it a little more heavily. And ... But they're overall open to it, which is great. That's a good project, that the biggest challenge comes from having consultants that have no experience in the best management practices that, you know, are commonplace in a place like Seattle. So they would say something like ... we're talking about a raingarden which is like a, you know, regular old ... they kind of need to not only know ... be educated on what a raingarden is and really understand how it works, how it's going to be successful on the site. They might have ... They're like, "well we typically pipe that out of here and we don't really keep water on site ever and ..." They also, in a place like Dallas, have quite a different climate than here, where they have flooding conditions and things like that. So there's quite a bit of work that needs to go in. You know, we have specific meetings and develop specific drawings and diagrams to educate civil engineers on practices that we typically use. And I think in a project ... I think the interesting thing about a project like that is that, although we probably won't ... it won't be like LEED Platinum or Living Building certified and everything, I think the opportunities for education are pretty great. And it's ... it can be really frustrating, but at the same time, by doing it once they've done it and then that ... it's much more easy for them to do it again in the future, we would hope. So I think there's ... it's ... there's a lot that comes out of it though, but it can be pretty tricky and challenging. And it's a lot more difficult to go back and forth with the civil engineer. It takes a lot more time and a lot more hand-holding to get there. So that's ... and that's the type of project we sort of more, randomly placed national projects that Noelle was mentioning where we're kind of in this more educational role a lot of the time.

Noelle: Or we've been hired specifically from a national pool for the work that has been done in this office before. Because that's what they're looking for.

Christian: And that project, we ...

Noelle: And that would be a great question for Deb because she's really the one who's like talking to the client, you know at the interview process and then continue to work with the client to keep understanding what their goals are.

Christian: And then having ... Deb is on this project and just kind of witnessing (this would be my perspective on her approach), and that is ... she like will ... she pushes it pretty hard. And she'll push it to the point where some other people on the team might be a little uncomfortable with how hard she ... how much she's pushing it, like best management practices. And you know, a lot of times, she'll eventually win out, and they'll go for it, you know? Or she'll ... So I've noticed that ... that's her approach is to really kind of see how far she can get with it, especially with a client who's ... isn't coming out and asking for it. And that can sometimes work out and sometimes, you know, eventually have to kind of settle for something a little bit less. But in ...

Noelle: You have to aim high or you won't get anything though ...

Christian: Yeah, you have to aim high. Aim high and push a little bit farther than maybe everyone feels comfortable with. But of course knowing that you got to eventually back off if a client's like, "no!"

Noelle: There are so many systems though that we're constantly learning and so it might not be comfortable for other team members because they have never seen it done. But it's like we know from our practice or we know from other people's research. I mean that's our role too, you know, educating the rest of our team, the rest of our team educating us. We're not architects, we're not engineers, we have a very specific role that's very general, you know. So we're trying to think of what ... we're trying to do what the best thing for the project is, you know. To advocate for the landscape.

Christian: And we're being educated by the clients and by the consultants down there too that ... on local conditions, local precedents. I mean for instance, say we're like ... of course we're going to suggest, "what about a greenroof? What about a greenroof? Or this and this for practical benefit?" And they come back and say, "show me a successful greenroof project in Dallas." And we're like, "hmm ... I don't know if we can do that." And it suffices to say that we're not going to be the first to test or there's a few greenroofs in Dallas but they're not doing that well, and there needs to be a lot of work done. And that's not the type of client that's willing to be that first adopter of that practice.

Noelle: Or in the, you know, in the project in Pennsylvania, you know, it's the same kinds of things. Like we are ... they wanted to be the first people to do constructed wetlands, to deal with all the lime coral in the region. And that was one of their goals. So like that's the opposite end of it, but it's like, you can never make assumptions, you have to ask questions and try to help advocate for the landscape and push some concepts along. You're going to ... You don't necessarily have the answers or even know, you have to do research, you have to have the conversations so you can come back and try to figure out, you know, the answers to questions people are asking. And the conversation continues or doesn't.

Christian: This project in Denver, the Healthy Development Measurement Tool project, when that ... in the master planning phase which occurred like five years ago (I wasn't really involved in), but they were looking for a way to frame the master planning process to kind of create a more community-centered kind of project, but also tie evidence into it. That's ... that was a really good example of you know, bringing the health and health assessment into the process and that was an example of ... we brought that idea to them, the client was kind of openly looking for something and once they ... once they kind of understood that process, they really embraced it and then they kind of took off with it. And it really kind of, in a way like sort

of really revolutionized how they thought about their projects, the Denver Housing Authority. So ... and they really ... and they've really integrated it into all ... their institution. I think using health as an umbrella for their development projects and you know, measuring the health of the communities that they're charged with working with. And so that would be another example ... that's sort of another extreme one, sort of looking for ... where the client's like looking for the best strategy and in that case we're able to kind of you know, bring to their attention this possible ... this way of doing things. And they've took off with it so ... and they're still kind of using that.

Noelle: The other thing that I was just thinking about, while Christian was talking, was you know, looking at ... in terms of evidence-based ... I mean the licensing process for ... and tests and ... for becoming a landscape architect also ... all of those practices are rolled in. And it's sort of a weird national scale because they don't ... they're ... every region has different practice but ... But just have ... you know, our licensing process is very rigorous and so that is another evidence-based ... you have to ... you know, if you go through that process and you continue to educate yourself to keep your license, then you know, you are ... it is part of ... integrated into our national licensing standards. I mean, I think it's challenging, but they're always adding things to it, so the licensing gets more difficult because we're just ... we add more and more to our field. But we have such a young field compared to other fields that it's going to continue to grow.

Elise: Switching gears a little bit, how do you share findings and lessons learned within the firm?

Noelle: Well, I think you know, there's sort of all the informal methods that ... of just you know, email discussion among the team. I think we all have informal discussions among our team and because there's usually one landscape architect and Deb on the project ... if it's a large project, maybe two and Deb you know. There would be ... you know you'd sort of ... you're bringing those lessons to your architecture team and then to your breaker team, from the landscape group. With specifications, we'll try and roll in things that we've learned in similar projects into you know ... into new projects so we don't start with a specification that's out of the box from AIA because it doesn't necessarily have any ... have the things that we think are just standard practice. You're constantly researching things that are new, you know, there's new systems that you're trying to use.

Christian: There's a lot ... just kind of thinking about it ... there's a lot of informal discussion.

Noelle: You'll ask your team members, you know, what they know. And look at other sets of drawings and sets of specifications and ask people if that worked, you know. Or you just ... Deb even has been on so many projects that she'll say, "oh you should look at this, this and this." And you go look at them and you're trying to figure out why she was saying those projects sometimes, because it's like, "I don't understand what she means by that." And ... but we're not very prescriptive here, so it's like if something that will spark an idea or if you're learning from ... how you're moving the water across the site and looking at it ... and it's a very different site going with very different materials, so it's just a spark of an idea. It's like, "ok that's interesting. How could I do that on my site with these grades conditions?" You'll start from a detail from a previous project and you know ... and like for, I don't know, for stormwater things and development for your project. So you wouldn't even recognize it as being started from another project by the time your project's over, but that's where you started in terms of what you're doing for ... you know, not using filter fabric, you're using gravel that's standard in City of Seattle that doesn't require filter fabric even though there's rock. I mean there's just like ... you just

continue to just ... stuffing things in your brain and remember them ... and you kind of remember something and you'll send an email out, "does anybody remember what this was?" I mean it's pretty ...

Christian: Someone like Sandy, our other ... one of the other leaders of our team, she is ... she'll send out emails about ... she'll be kind of tracking maybe soil specs and things like that. Or she'll send out stuff about, you know, there's continuing education, kind of, seminars or webinars where we try to keep up on the latest with like street trees or soils and you know, there's debates about ... Actually, up here in Seattle ... Noelle interrupts

Noelle: bike.

Christian: ... bike stuff.

Noelle: stormwater code.

Christian: (*continuing his sentence*) there's an article about bioretention mix ... soil mixes and whether or not they were being successful in some raingardens in different parts of the Puget Sound area. So we'll send that kind of stuff out to our team and you know, I always ... there's a level of informal and then I think ... probably the most formal process is with specs and details. That's like... that's the record of what we do.

Noelle: People go to conferences and share. I mean it's a generous team. And also, I think even in the Northwest, we're very generous amongst our peers in other offices. They're competition obviously, but we're also all trying to do better work. And so there's ... you know, I came from another office but I've worked ... I went to school with people who are in different offices and people can share... You won't share all of your ... all of your things that you've learned that are ... that took a long time, necessarily, in a very formal way. But you can have a discussion or you'll see someone's project and then, "how'd you do that? That's really cool." So there's ... I mean that that is part of the culture in the Seattle area, is the generosity. And it's very much the culture within our team in this office. It's ... Things are changing so fast that you just have to be. Because if you can share something with somebody about them and they'll share with you like ... I mean there's just an expectation for that. I think ...? (*Turns to Christian for approval. Christian nods in agreement*) I mean, certainly I'm always. And then you're always talking to reps. We have reps come in, you know for products, for gabions, for furnishings, you know, and they'll provide information. So it's all kinds of different ways, I guess.

Elise: And how many landscape architects are there here? How many are you basically sharing information with?

Christian: Thirteen? Twelve ?

Noelle: I don't know if they're all ... some people are ... Does that include ... like there are some people who are urban planner sort of?

Christian: It's like ten or twelve or so.

Noelle: Ten or twelve-ish. Yeah, I don't really know exactly.

Elise: So it's easy to share amongst ...?

Noelle: And we also have some people who are also architects, so they work on both teams or work on different projects so ...

Christian: (*in response to the question*) Yeah, there's some ...

Noelle: (*Noelle interrupts*) Yeah, it's pretty easy because it's that size ... that scale.

Elise: Right, to informally talk through email or things like that.

Noelle: And I think, you know, we read ASLA magazine, which costs a lot every year ... (*both laugh*). So, you know, we look at national projects. I think we're naturally curious disciplines ... and nosy (*both laugh*).

Christian: Ha, nosy ...

Elise: So where do you think you go from here to continue to advance evidence-based design within the firm and in the field? What do you think has to happen?

Christian: We both had this discussion with relation to the case studies about how to better work with academics, students in a way that can be more beneficial to both the firm and to research, the body of research that's out there. And that is a work in progress but I mean, I think we're trying to figure that out. Basically, the challenge is that both the timeframe we're working under is kind of compressed development timeframe and we don't have time to do a true academic, scientific research project on any project we have; it's not like science. So we have to ... part of it is like for me, because I have a background in science so ... part of me is acknowledging that as designers, we can't be scientists. We have to understand how to like figure out ways to partner with scientists, with researchers in a way that can provide more information. It'll enable us to do our work better. And I ... We're still trying to figure that out, that's a big challenge.

Noelle: Yeah, it would be great if there was some ... I mean it would be great to sort of ... it seems like the ... getting some grants so we do more research ... so we could research.

Christian: For us, we basically, as a firm, as designers, we need money to pay ourselves to work. And so that either comes from the project and that comes from the client, that's if they want to pay for it. Or it's some other means like grants where that could fund like a little research wing within our firm. And I think some firms have had that before, I know OLIN may have or still does have a little research wing of one or two people. Not Sasaki but ... whatever EDAW is now ... AECOM. But EDAW, I know a friend, a guy from my school, when he graduated went to work with EDAW and he was totally in the research wing, that when the economy tanked was like the first to get cut (*both laugh*).

Noelle: Yeah, and I don't think you want to silo that away. You know, it's hard because we want to keep our finger in the science, we know we're not scientists but we're probably the only ones talking about ...

Christian: ... those principles.

Noelle: I mean it just depends on the personalities you're working with. But I had a really great architect that I was working with in the field, I was like that ... I was telling him that the water's going to get pumped up through the cistern. And he's like, "but how does that work?! I don't believe it ." It's like, it's science! And he's like, "gasp!" (*both begin laughing*) And he was laughing at himself you know, but he was like, "I never think about science!" Because he was like a totally aesthetic guy. You know, so it's like, "trust me. I will work with the civil engineer. It's science and we won't do it if it doesn't work." So it's like, you know, so we have to keep our finger in there, you don't want to be too siloed. But I think we're all curious.

Christian: So it's sort of like some blend of figuring out a way for us to fund more investigation, more time to figure out that ... develop more baseline evidence, and to monitor what we've done, and do those post-occupancy-type research. But if we can't do it, then we need to figure out a way to partner with people who can to make it happen. And that's ... every situation I've seen or read about here at the office, it's sort of, every situation is different, every set of partnerships is different to make it happen. Whether you know, with this Denver project, we got funding to bring consultants on that were public health experts, who were experts in the various fields and sometimes you can do that, sometimes you can't. Other projects like the national parks, they have built-in like resource scientists who can give us all the data and information and that then helps inform our design decisions. But so each case is different but those ... finding those partnerships. And in the case of these LAF case studies, ideally it'd be great, you know ... in this last project you had some ... (*To Noelle*): this isn't proprietary is it or it's still like ...?

Noelle: Well I think that, you know, with the economy changing, that there you know, in my previous office and when the economy's better, you can role some of this research work into marketing and see its benefit. But there's ... now in this economy, there's not that ... there isn't that ... there isn't as much give in that. And so it's like, it seems like to do these kinds of follow-up for the actual firm, not just the university and the researchers, we need a little funding. Because it's like, we're the characters, we have to do a lot. You know, so it's like, how do you balance that? What's the ... That has to be ... that's an upper level decision, I think, in the office that we aren't really at ... making those decisions. But like you know, I would ... I was talking to the people at the Landscape Architecture Foundation recently and I said, " you know, really we've done all this work and we could have used some money because we have to continue to do work to get this to a point where we want it ... it's a great marketing tool, but the grant shouldn't just go to the researcher, because they're just getting information from us, and we're spending exactly the same amount of time, and more than them." So it's like ... so we were talking about it ... I mean I don't know what Landscape Architecture Foundation's feedback on that and I don't know that Deb agrees with me but it seems to me as ... you know, we're also a business , you know, it seems practical that we should be starting to let that happen, because actually we are doing research in like real-time .

Christian: That's a great point. That it's like, as hard as we might try to, there's no way for us to not do work when it comes to doing the metrics and quantifying the information. Even if we have a couple of great academic partners that are willing to do as much work as they possibly can, it just ... by default we have to coordinate the effort of getting that information together because we were involved in the project . And so we do that work and then it ... and it always ends up being more than that. So there's sort of that ...

Noelle: We *want* to do it, but we'd love to get paid (*laughs*).

Christian: So ... I mean it seems like moving forward ... and I think this is what LAF is trying to figure out with these case studies, is how to structure it but it does seem like both academic researchers and designers need to be funded to develop the case studies.

Noelle: I don't know if the Landscape Architecture Foundation would necessarily agree with that. I don't know actually, I mean like we've had conversations about it, I don't know what their opinion is.

Christian: (*adds in*) That's our opinion, is that we should be funded.

Noelle: I can give you their information.

Elise: I actually was one of the research assistants last year so I'm familiar with their process.

Noelle: At the ... in D.C. or you were working on one of the projects?

Elise: One of the projects, yeah.

Noelle: Oh okay. Yeah so ... Linda's now not there, so Katherine is there. But you could ask them what their ... that would be a good ... I would really like to know what their thought is on that. You know, because it's ... I think it's just the market has changed significantly from when they were established to now, it's a real challenge.

Noelle: Hopefully they'll grow enough that they can bring in more money and be able to.

Noelle: I think the research they're doing is really valuable. And you know, it's really helpful to be able to say ... to point out real metrics to educate your team to get everybody on board with it, instead of just being sort of this loose science stuff that we've been doing for years.

Christian: More or less development, the more we can pull on that too in addition to all the other work we're doing here, we can use a lot of the tools they develop and a lot of information. So that's pretty beneficial.

Noelle: But you know, it's like LEED has become ... LEED has become this like that people ... that is sort of marketing itself, you know. People want it on ... they want their project to be LEED. You know, hopefully SITES will be the same. The regional code really helps, if you have code for stormwater like we have in the Northwest or in City of Seattle or if you have Green Factor that's required in certain neighborhoods. Or you know, if you have those kinds of ... those are really benefiting us and helping do more green work, more work that's ... you know, without having to argue about how many trees you have on your project, you know, then you can move forward with that as an assumption, as a given. Your building is going to have walls and your site's going to have trees en-route. And then you're going to design, you know, you're going to have to have raingardens, or you have to do infiltration in some way, or you got to have a cistern, there's no ... You got to do one or the other, so ... So as the codes catch up, I mean City of Seattle is very advanced, Portland's pretty advanced, and Tacoma is sort of catching up but they were way behind a few years ago, I haven't worked on their projects lately

but ... So it's like, it's very ... so that code really helps, so if there's ... so that helps us do our research as part of our work. Because it's required or the code requires a certified arborist, not just a person who, you know ... Or a soil scientist so that you can do ... or they require a really good survey, or they require a soil survey or information on geo and that kind of TAC stuff. Or you know, it's like ... so if those things are in the code, they have to be required as part of the baseline for the project. It's not something that can be cut out. The arborist is gone because ... we're not going to protect the trees. You know, so there's like ... so it's like all of those things keep adding. And you know, as people are aware of climate change issues and issues with urban development and as urban land gets more expensive and it's worth people's while to put their parking lot under the building as opposed to like a giant parking lot on-grade or you know ... So all of those things, although they sound horrific, that one particularly, I mean, it really benefits the urban environment so you don't end up with vast fields of car ... of black reflective surfaces you know. So ... yeah, there's a lot of ...

Christian: I think we've been seeing too that this ... the whole health angle is also developing a lot too, so in ways to kind of ... another way to actually broaden our like reach and broaden the field and the way to think about things, to bring in kind of social equity, community, and built environment, the landscape, the actual ecological systems under one umbrella that sort of is ... can be measured more, in a lot of ways, really more easily. And so those are ways. So that's ... that seems to have a lot of promise to it.

Noelle: Well and I guess probably with that too ... because healthcare, the cost of health is so expensive. If you can role that into your design as ... you know, if you can get everybody on board that what you're doing will benefit them because people will have a walking loop in the site or whatever. That all helps. I mean the negative things also help the unpleasant side in terms of ...

Christian: So in that sense it's like looking beyond just trying to quantify just soils or some sort of physical phenomenon like water, there's also this ... sort of effects on people, economy, things like that that can really change the conversation a little bit or give you more ... sort of more options of ways to kind of sell these techniques or ideas.

Noelle: I guess we ... I rarely think about the economical, but that's a really good one. I mean it's like ... really counts.

Christian: (*scoffs*) Yeah, well we're going to do that one better too, yeah.

Noelle: If you're with this distance from a park or if you have, you know, this kind of landscape then you're property values are worth this much more. I know with both ... like if you have this much tree canopy in your neighborhood your property values are that much higher, you know so ... I mean they're pretty ... it seems like sort of a stretch but when you look at it, it's a really simple calculation. I mean if you can plug it into one of the national calculators and you show it, people so they understand the value of it and they don't cut that tree out. Or they don't not do Silva Cells under the ... or something that helps put all that structure in the ... tree roots being green. So, because they can look like a really big ... for instance with the Silva Cell system, it's like a very large economic, like, outlay in the beginning. But if you'd say, "okay well it's similar to like a street light and it provides this much stormwater benefit and then you don't have to do this on the greenroof, so ... and ultimately your property values will be worth this much more." And it's always hard to always like have those, you know,

for talking because we're not like human calculators but if you ... if that's what you need to help you make economic points ... I mean I rarely have this conversation but ... early on in the project I think it can be really strong for specific clients to have them.

Christian: Probably another one coming down the line is just more and more sort of focus on climate change mitigation and adaptation. And cities will probably be continuing to update their codes and practices based on that. And we'll have to adapt to that and it's also another way for us to kind of you know, sell the benefits of whatever project we're on, when it comes to something like, whether it's creating carbon sinks or creating more adaptability in the landscape ...

Noelle: (*Noelle interrupts*) ... urban flooding.

Christian: ... or yeah, urban flooding (*both laugh*). I mean well, as an example, like down in Dallas we're right on this creek that you know, has pretty big floods every year ... yearly floods. And since the project's began, in schematic design, we went from designing to the hundred year flood elevation to like the 400 year flood elevation because in that period of time Sandy happened. And obviously the client was like, "okay maybe we should kind of be better safe than sorry." And so I think that ... those kind of changes are going to be coming too . And the more we can kind of talk about it in that way too will be beneficial.

Noelle: Yeah, I think that Deb worked recently on like a comp- (we may not be able to mention the name of that) a competition that we've been selected to ... for a shortlist for. And it was looking at flood zones on the coastal ... on the east coast and the coastal zone and how to develop that without developing ... basically developing in a flood zone, but how do you develop so that you're not going to be flooded every year. So those questions are coming up too in competition for ... and I think, you know, not just ... we're not the only ones who are interested in and the client's not the only one who's interested in it. Sandy, it's like ... it was such a surprise to people that even developers are thinking about it because if they're developing a property that they're going to hang on to or they're developing a property that they've insured for a certain amount, they don't want that kind of disaster to destroy all of their ... So it's like you kind of have to expect a huge difference.

Christian: It's becoming pretty ... the reason why they're kind of shifting I think is because it's becoming so obvious the amount of cost of dealing with these disasters after the fact. So being able to kind of sell your ... sell these sort of techniques or ... that might cost a little bit more up front, could become easier in some cases because the developer is going to be like, "okay, you're right, this probably will cost me one billion dollars in the future or the insurance company's premiums ... the insurance premiums will be this much higher ..."

Noelle: "... or we won't be able to get insurance so we won't be able to rent these properties so ... Just also, I just thought of like federal funding has changed. So for like, I know it's been the last ... I don't know exactly when it flipped but ... the last time I looked at the research, which was probably four ... three to four years ago, where the federal funding for transportation is no longer so heavily leaning on car and freeway. It was also ... you had to have a certain percentage to get federal funding. You had to have a - in your state - you had to have a certain percentage with ... that went towards multi-modal transit, light rail transit, and integrated bike lanes and ... So federal ... federal codes also help us. I mean it just depends on the scale of the project, so there's a lot of it lining up that are helping us to do greener, better work. And so if people have to ... if people are getting funding

for a light rail project or a local ... (*aside to Christian: What's the Cabin Hill ...*) streetcar projects. You know, you can get that ... some of that funding is federal and so you have to meet certain things and those are things that we can design as a project. But civil engineers and traffic engineers don't necessarily think about ... don't necessarily ... aren't necessarily the experts in and so then it's more scope for us to look at, something else that we can start to integrate.

(Later during informal discussion):

Christian: I'd be willing to put money that all the firms kind of say, "well ... it's kind of like improv on each project (*both laughs*).

Noelle: I mean I think at the conferences that people definitely share their process, but every project is different.

End

(Elise gives introductory statements and definitions)

Sure, no, I think that's actually really useful. That makes it a much more interesting approach. People default to that, it's easy to default to that.

Elise: Can you please describe, in your own words, what Mithun's evidence-based design approach is?

Deb: Well, I think it starts with really getting ... giving folks opportunities to really look to ... to search out that information because of their own curiosity. And I think that we have a lot of curious people at our firm and I think a lot of people search that ... automatically kind of search that information out because they want to know more. So I would say, as you probably got this sense from Christian and Noelle, that your phrase, you know, how do we *formally* integrate it, we're a fairly entrepreneurial firm. So what that translates is a lot of things we do are more informal. And so while we have tools that we use, like ... we do have ... checklists and things that people *can* use, if that's what they would like to do on projects, there's not sort of a requirement we have a lot of curious people at our firm per se. There's a lot of ... there are a lot of expectations, you know, I guess along the lines of you know being entrepreneurial. Where, you know, there are a lot of expectations just through the conversations that we have as teams, you know through the crits that we do in the office that sort of set the bar and ask the questions about you know why is it this way or what information do you have to back that up? You know, there's a lot of that kind of conversation but it's not necessarily formally integrated.

I think some of the things that we *do* do to sort of get people on the track of thinking that way is that we do require folks to be LEED certified. So if you're ... yeah so that's actually a requirement at our firm that you need to that after ... at least within the first six months. And we also offer classes in-house that ... a lot of classes are ... relate to ... what you would say would be scholarly evidence or things that people are discovering, information that's being shared. We have a very active IT group that keeps our knowledge ... keeps spurring us to kind of get knowledge-based articles you know, being shared within the firm and externally as well. And then we have a lot of things that are maybe a little more diffuse but I think actually have impact, which are things like where the firm really kind of walks the talk. So we will, and I can get you the more detailed information about this, but just broadly, we will reimburse folks who decide to energy retrofit their homes. And so we will match sort of the public grants that are available to do that, so that it makes it more attractive to you know to do that. Or we have a lot of bike commuting and in-corp and battery recycling. I mean we just do a lot of those kinds of programs within the office which I think ... You know green power, we'll match green power ... people who choose to pay for green power on their electric bill personally, there's kind of a match from the office. So there's a lot of those kinds of things that just get people thinking that this is important. And I guess we also support a lot of folks going to conferences and getting information and bringing it back to us and sharing it within the office. So to be more specific, I guess, well another way that we kind of approach this is, we rely quite ... you know, we gravitate toward the consultants that are using you know more scholarly you know evidence in *their* work. So the folks that can really speak to, you know, this is the latest research, you know, this is what you know people are thinking about now and what's coming out of the research. So you know inevitably gravitate to the civil engineers

or the soil scientists or you know, the different consultant folks, ecologists that are thinking that way. And so those, I mean those, I know that's probably more broad than what you're thinking, but that's kind of the ... well it is kind of the way we operate as a little more entrepreneurial-based and less you know, here's the path.

Elise: You mentioned something about classes within the office about research. Can you talk a little bit more about that?

Deb: Sure. You know sometimes we will invite professors in, so we'll have ... We had Lynne Manzo last year from the University of Washington. And she came in and talked about her research on affordable housing projects and the post-occupancy studies that she had done with the users. And you know we have a very close relationship with the University and so we do a lot of back and forth with them in terms of sometimes, you know, we have a lot of folks that go in and speak in classes or teach classes. And then we invite professors quite often to different classes or to different events at our office; so that's one example. We had Thaisa Way from the University of Washington come in and talk about her book on women landscape architects that have been overlooked in history; that may be a little less evidence-based design but ... We have, you know, the folks at the [Seattle] Daylighting Lab or consultants like RWDI come in and talk about wind, their studies about pedestrian environments and wind impact. And actually I'd be happy to follow up and ... because I know we have a list of kinds of classes that we have and that can give you more specific examples. **Okay yeah, that would be terrific.** Sure.

Elise: And how often about do you have these classes?

Deb: It's kind of amazing, it's kind of hard ... there's so many opportunities that actually multiple times a week so ... yeah. So there's an education committee within the office that volunteers, you know, initiates these ideas and usually it reinforces a theme that the office is focused on at the time. And you know, sometimes it does, sometimes it doesn't. But a lot of times it's reinforcing kind of a direction that we're trying to head. And it can really vary, so everything from, you know, very specific and technical, it might be a product-based lecturer that comes in. But it also might be someone from within the office that may be sharing a conference that they went to and talking about that. Today we had one on ... a group of interior designers, landscape architects, architects talking about ... that were more the junior staff, talking about what inspires them. And having a bit of a design conversation around you know how we can take our personal inspiration and integrate those into design. So it really ranges pretty widely.

Elise: So when would you say evidence and this idea of research first emerged at the firm?

Deb: I came to the firm thirteen years ago and I mean ... well you know, actually, it's interesting, we did kind of a historical retrospective of the firm a few years ago to sort of remind people what our history was as a firm. And the founder of our firm, his name was Omer Mithun, and so he was a professor of architecture and he was doing ... he did a bank for example, a small little bank building that had a water ... a roof that held water in order to create heat (*laughs*). So you know the water became kind of a "heat sink" to warm the building. So I mean it was just sort of fascinating to me that some of that sort of types of experimentation and innovation has permeated the firm for a while. But probably in its later iteration, you know, was about you know, sort of the way we think of it today I suppose ... (*inaudible*) as teams you know twenty years ago would be sort of thinking about ... the REI project for example, the REI corporate headquarters, we started thinking about how

to you know, vent natural ventilation and how to do that in a retail project. You know, so some of the kind of, some common things that started to emerge in our projects that started to put together a picture of how we thought about projects, I guess. Another, I guess evidence-based design from the SITES side, you know, I think The Islands was a project, although we were not the landscape architects on that, that was before we started our landscape architecture practice at the firm. But the ... there was a strong ... research that went into you know how that masterplan would occur. So it was kind of McHargian you know in terms of its layers and ecological assessment of how the ... where things should be located. And so I guess I could point to a lot of different projects along the way but I think probably fifteen years ago. But it's resulted I think in ... as it evolved, it's resulted in us I think having a much greater understanding of what ... which things are relevant, which things emerge as relevant on projects as opposed to sort of taking ... our urge is always to take this comprehensive approach; that everything is important. You know, we want to pursue every factor. And I think we've discovered over time that each project has a trigger or a thing that pushes innovation in a certain area. And so I think that's something we've come to realize too, that it's kind of an organic process, that it's a little different on every project.

Elise: And can you go into a little more depth about how the ... how you feel the firm has evolved with evidence-based design? I'm assuming a lot has to do with the evolution of LEED and SITES. Is there anything else?

Deb: Yeah. I think that what is interesting about those rating systems – as I think about you know the many years of sort of how those got off the ground and then you know what impact they've had and how we think of them today and sort of the pros and cons of them – that in the end I think what we've felt really strongly is they have a really important role in motivating everyone on the project. So if you know if people commit to those rating systems, they're committing to evidence-based design. And so that means everybody's behind it and everyone's kind of on the same page. So there's a lot of power that sometimes rating systems get criticized because they feel kind of too generic or too standardized or not you know ... that the particular issue doesn't apply you know on a project. But what they're ... what I think we've just felt over time is that they're a really good hammer (*laughs*) and you know you kind of need a hammer to get everyone on the ... moving in the same direction. And that's been extremely powerful, plus I think because we've really taken those to heart and really integrated those on projects, those practices are normal practice, we almost don't even ... you know they're kind of ... it's amazing what an impact it's had on our practice and I think on the industry as a whole because you know now we're talking about LEED Silver on project is sort of standard and even you know LEED Gold is always pretty achievable for most projects. And that's just you know ... you wouldn't have been able to ... people were complaining about how onerous that was you know ten years ago. So you know it's kind of in that case there's significant change in the marketplace and we're kind of looking forward to SITES having the same impact for how we look at soils, vegetation, and habit issues, health issues. So I think it'll happen; this is the stage when everyone's going to complain about how difficult it is and who's going to pay for it and you know, “why is it this way?” But then ten years from now it'll be normal practice (*laughs*). And so it's just sort of one of those growing theme things. So that's had a huge impact on the way we do things. And I think being able to have something like a Living Building Challenge, where we can describe for a client a vision of where things are ... you know, could be in the future is also incredibly powerful. So that they have their peers and their counterparts, and everyone sort of has a shared vision of what *could* be happening – that's a pretty powerful tool. At least for moving ... you know what usually happens is it moves the dial in one area you know on a project, one or two areas – and that's pretty useful in total over time.

Elise: Tell me a little more about the evolution. Have you ... is there something that has made it, the approach, more efficient, more formalized, or more marketable? Anything has to do more with the business model of the firm that has evolved with evidence-based design over the years?

Deb: Hmm, right right. Well I think we feel like you know we're not pioneering, or I feel like we ... we feel like we're kind of people are catching up to what we're doing because we've been doing it for a long time. We're glad that that's happening. I think what it means for us is that we have to keep pushing ourselves to understand what the next horizon is and to be nimble about being ... providing that thought leadership, because I ... that's ... we like doing ... that is our business model, is that we want to be doing the complex projects that are unique and kind of push the boundaries. And so we have to ... it kind of pushes us to think further and go further, you know just in terms of both technical and design arenas. And making sure that we're working with the right you know the consultants that are also doing that at their firms. So I think that that integration ... we couldn't over-emphasize I guess how important it is to you know to have the team members that we can ... that everyone wants to do that together. Because that's ... I think that's where we've seen the greatest value of that evidence-based design process come out is when everyone is sharing that kind of attitude. Because it doesn't work if like just one ... (*chuckles*) if one firm is like, "we do evidence-based design," and all the other firms are like doing their straight ahead stuff. It's not going to be ... you know not going to be as effective. So it really has to be sort of everyone firing on all cylinders.

Elise: Do you find that you're teaching the other firms and consultants about your process?

Deb: Yeah, that often does happen. We have sort of addressed that in a variety of different ways. Sometimes we'll bring in a consultant in the same discipline as just an advisor and so they're working with a firm that maybe hasn't done that kind of thinking before. You know, sometimes we end up doing the work where we kind of know enough about it to kind of push a little bit but it's not really our area of expertise but you know we've been through the process enough that we kind of push it a little. Sometimes ... you know, sometimes we even ... you know we've even changed consultants, but it hasn't worked because it's so important to have the right consultant really be you know driving that innovation. But I'd say for the most part we're you know ... we're ... with a whole range of different skill types, but we're always looking for the best ... those best alliances.

Elise: You touched on one of my next questions about how you get your designers to share in the mission, and you said that they're ... the design culture of Mithun is just very self-motivated and entrepreneurial. Do you ever have a system, almost like a watchdog system, to make sure that evidence-based design is informing design decisions?

Deb: Yeah, that's a good ... our process for that is ... we do a lot of crits that the whole office is invited to; where you know, people are invited to bring issues up and that's often one that comes up. Or, as sort of more ... and this is a formal process that happens, you know we have a design principal on each project that is really – or even a firm partner as a project director – who are both responsible for that. So they're responsible you know, for ... (*inaudible*) ensuring that we're using the best available science and we're really asking the questions and we're ... you know, really going to the folks that about ... so we're connecting the dots of a lot ... also that their goal is also to make sure that things we've discovered on other projects in the office are applied to you know... that there's communication going on within the office so we're not reinventing the wheel every time, that we're

actually, you know, referring projects to each other. So you know, “hey, so-and-so figured that out on the last project. Why don’t you go talk to them.” You know and they know about this issue. And there’s a lot of that that goes on. But kind of that project director role, to make those connections if the team isn’t doing that.

Elise: Have you seen or not seen a change in like the spaces of the design office over the years that has kind of evolved alongside this idea of research and collaboration in design?

Deb: Hmm, that’s a really good question. Yeah, definitely. We’ve ... you know we’ve gone for, you know, probably for the last ... for many, many years we’ve had sort of a model shop that is still very central to our ... a physical model shop that’s central to our work, and public and out in the middle of everything so folks are ... feel more invited in. And there are natural kind of crits happen walking past the model shop and the model activity. But I think, you know we’ve gone ... our office in particular, we don’t sit in studios . We sit particularly ... we sit based on project teams. So landscape architects will be sitting with their primary project team rather than ... we don’t have a department for example. And so that really helps us be a lot more collaborative and a lot ... share a lot more information and hear from the project teams you know, a lot more often. And so you know, that’s one way we’ve been organized. And I think the other way that we’ve changed or changing now toward ... we’re talking actually about experimenting with getting rid of desks and actually having more lounge-type spaces where focus is more talking around their laptops. And we have ... that’s really been ... we’ve started experimenting with that in one room that ... where we’re doing a lot of computer demonstrations or we’re kind of talking around the computer together, so we have a big screen and you know, we’re able to sort of have a project team in there and talk. You know, and everyone’s sitting around on couches and we’re all talking about the project while someone is flipping through, you know, the images so that everyone can see things at the same time. And so we’re doing a lot more of that. And probably are anticipating in the next, you know, one to two years really converting a lot of our office to that kind of model. We’ve been playing around – I wonder, you may have heard this from other firms too – but we’ve been playing around with the Apple stuff where you physically move your arm, (*laughs*) you know, the stuff you see at the airport now you know. Where those ads ... your arm is moving things on the whole screen. But you know where we’re at would be incredibly useful because we’d be able to literally kind of draw and talk on a screen together.

Elise: Can you please describe how project team organization has or has not been affected due to the evidence-based design approach?

Deb: I think we ... when we can, it leaves ... we want to have a greater range of consultants, that’s one thing. You know when that’s ... when we can work that into the budget. We are definitely pulling in more specific expertise. But within our office itself, that evidence-based design, I mean ... what we know ... a lot of times frankly it’s a particular mindset, and so there are some people that are going to be stronger in that mindset than others. So sometimes those folks become resources on a variety of teams. So it’s not just you know ... every team is ... has that expectation, but you know every team might not have that sort of mindset to you know work through the analytical side of what evidence-based design is. And so there’s you know, some folks that kind of become resources to a variety of teams because they’ve been through that process before. So that’s a little different. But it’s kind of similar to having your technical guru you know (*chuckles*) on a project. You’ve got your analytical guru that kind of rotates around – or a handful of them.

Elise: On a little bit of a larger scale, have you seen a change in the firm structure at all?

Deb: Well ... we definitely are moving ... there's a lot more ... the way we've structured ourselves is a lot more – what do I want to say ...? Not fluid necessarily, but we're ... it's definitely more collaborative across ... we were really organized around you know, private, public, and non-profit work. And so you know, we're what we call mission-based work. And so ... and institutional work. So there's ... in terms of how we're organized, we're seeing a lot more crossover there which is a lot of just ... I think the world is moving toward a lot more integration of the public world and the private world. You know there is more teaming, there's more partnering going on. And so we're just seeing a lot more crossover, I guess, overall. Which means that, in terms of evidence-based design, I think it means that there are some things that are kind of consistent across all of those that are applicable to all projects and then some things that are more specific. But I think that we're definitely seeing a lot of, in terms of our firm organization, we're kind of organized to allow that crossover to happen more frequently.

Elise: Any new positions or departments that are directly related to evidence or research?

Deb: I would say that we've taken the approach that we didn't want to because we're so anti-silo (*laughs*). That we're in ... it's sort of our philosophy that we've taken the approach that we want that to be everybody's commitment and expertise, so we haven't sort of siloed it to a department or particular person. But we want it to be more across the board. I think what happens in the meantime is there are people who excel at it and that they become resources but it's more informal, it's not designated. Because we want to keep the idea that this is not a ... there's no silo there; that it's an expectation that everyone should have.

Elise: Okay so can you please describe what impacts you have or have not seen to the types of projects that the firm gets or the client-base?

Deb: I guess we've actually been ... I'd say in the last fifteen years, we've made a pretty strong shift because of our interest in really complex projects and performance-based design that folks are coming to us specifically for that. So when they do their nation-wide search, you know our name generally pops up. And I think that's been really exciting and definitely what we're interested in is doing those more complex projects. And so that's I think really shifted us from you know, I'd say fifteen years ago when we were doing maybe ten or twenty percent of our work out of the region and now it's 75% of our work. You know because we're more of a resource you know ... a resource nationally for folks that want to do this kind of work.

Elise: What about clients specifically? And perhaps you can touch a little bit on your client relations based on an evidence-based design approach.

Deb: Yeah, I think that the clients that generally are attracted to us, I guess for the evidence-based design, are looking to not only help be accountable and to really, you know, do their own walk and talk, you know, they want to ... they have a reason why they want to demonstrate their commitments. And there are also folks that are often with organizations that want to go through some kind of transformation. And a lot of times we're able to help them kind of transform their business or their project or their institution or their, you know, their mission or reflect their mission. Because we can help them take ... use evidence-base design to demonstrate, you know, whatever it is their goal is and sort of have a real transformation occur. And that's exciting to see. So for example, at Chatham University in

Pittsburgh, the president was already ... because it was Rachel Carson's Alma Mater, there's a strong environmental commitment at the university already. And they wanted to take it further. And we got involved in the ... Noelle probably told you about it, Eden Hall Campus outside of Pittsburgh, where they have a 300-acre new campus that we're going to be opening in October first days. And it's a food-studies program in the school of sustainability. And they wanted to make sure that it was net-zero, you know, or moving toward net-zero, and have, you know a plan in place to be net-zero. They also are working with the State of Pennsylvania so that we can ... we will have a ... fully ... sorry ... on-lot-based water treatment facilities. So all of the sewage will be treated there for ... biologically and distributed, you know, on site so that we have the byproducts of nutrient cycling and that the really rich ... nutrient-rich effluent that we can use in the soil. So there's some amazing things that they wanted to achieve. But we had to do the calculations and you know, the evidence-based kind of ... made a lot of decisions to make that we turned to evidence-based design in order to make those decisions. And so you know, every ... in order to get those more broad goals, we had to use evidence-based design to kind of make all of the smaller decisions along the way to get there.

Elise: So obviously research and gathering of evidence takes time and money, can you discuss how you make research in practice profitable?

Deb: Yeah, that's a very good question, a very important question because, you know, with the economic downturn of the last few years, I think it *has* had an impact on firms' abilities to continue to do that kind of work. I think that it's still sort of in our DNA, so we still look for the projects where we can do it, where there's a ... something else driving the reason why, you know, they want to do it. So for example, and I'll take maybe ... I'm trying to think of it, an example ... probably ... we're just doing a project for University of Washington, it's a student housing project. And we're kind of ... went through the ... well that one's a tough example because we went through that one ... that was really more of a standard process of kind of ... which has become standard, or it used to be standard ... but the idea of really determining whether you could do the rainwater harvesting reuse or not, and whether we could afford to do it. But those kinds of ... those kinds of processes I guess are still ... are now part of those standard processes that didn't use to be part of the standard process.

But I guess to be more specific, I think ... I think it's been ... one of the areas that we have had some success over the years is the ... you know, we've had utility companies that need to figure out, you know, whether there's to the roof ... whether they really want to change the drainage rates for example. So they'll do some actual performance monitoring on the vegetated roof that we did a few years ago. And that actually contributed to the decision to change drainage rates for people that provided vegetated roofs on their projects. So sometimes it's a ... that was the public utility here in Seattle. So sometimes those performance monitoring can be paid for because, you know, there's a utility company trying to make a shift in their practice.

We've had performance monitoring by universities because they want to really ... they have a kind of a curriculum-based reason why want to demonstrate ... a research-based reason why they want to demonstrate what they are ... projects are kind of real-world examples of. So that a lot of times the institutions will step up and do that actual performance monitoring. Yeah, that's worked on a couple of projects that way.

Elise: Are these students in architecture, landscape architecture or are these more science-based students?

Deb: Oh that's a good question! We had ... in the case of the vegetated roof they actually hired a consultant that,

you know, was actually a data science ... data consultant that actually did the performance monitoring. So it wasn't a student-based project, which you know was an outright consultant. In the case of the university, they actually did hire, kind of a person like yourself, a graduate student, to go through the research analysis on the energy and water results of the student housing that we did in Portland. And ... called Epler Hall two years ago. But that was actual ... What I like about those two examples is those were not just sort of design performance, but those were actual ... actually monitoring the actual performance. And I hope that ... we've been seeing this for ten years but I think it's starting to shift maybe, is, you know, finding people to pay for that is very hard but that's the most important thing we can do. Because even if we say what we're going to design it to, you know, if we don't really know how it's performing, then it's not really that useful (*laughs*), so ... until we know whether it's really working that way or, you know, what kind of behavior issues, or what kind of functional issues come up and make it hard to actually get it to perform the way we want it to.

Elise: So just to clarify, that graduate student who was working on the campus evaluation, was that a design student?

Deb: Oh thanks, you asked that. I believe she had ... she had a science background but she was also a design ... she was in ... she might have been in architecture. But she had more of a ... like a ... it might have been some kind of analytical background. Because she was coming from ... in her, you know, bachelor's degree but her master's degree was in architecture.

Elise: So are you finding clients that are not on board with this idea, that are really reluctant to pay for the extra time and research?

Deb: Sometimes that happens. You know, just because folks are trying to deliver a project efficiently as possible. But you know we've ... I'm always amazed at, you know, when the folks are familiar with the process and can make it happen, and the client ... it's not going to cost anybody any ... you know some are ... very, it's not always ... but some areas aren't going to cost the client any more – you can really achieve a lot. So for example, we did a new trading facility for Goodwill here in Seattle and even though it was probably one of the tightest budgets, we cannot ... that's a team that was really able to achieve some really aggressive goals in water, on-site stormwater, and water reuse, and energy to kind of, they just did it at the end of the project context. And the client wasn't going to be able to pay ... the client was a mission-based client that didn't have a lot of extra funds lying around to ... It's one of our higher-performing projects (*laughs*), which is always fascinating to me, it doesn't always mean the client has to pony-up the money and sometimes it's the ability of the project team to kind of make it happen because it's just the way they work. Right, it's become more integral ... it's become more integral in the process. Yeah, it's definitely more integral. And you know, we have the good fortune here in Seattle that all of the codes and requirements support the ... (*inaudible*) that we have to meet a certain amount of that, you know, automatically. So for example, the ... there's a project where ... a director's rule, I think it is in Seattle, that there's a goal to keep one hundred percent of your stormwater on site because any runoff is going to go into Puget Sound and create problems. So is ... most urban projects can barely achieve, you know, thirteen to twenty to thirty percent, that's a huge ... But this project has achieved over ninety percent and it's a very urban project so ... there are lots of ways, you know ... they have a big rainwater harvesting cistern, they had a rain garden strip in front of the building in a really tight space. And somehow they worked together to be able to afford the retaining walls and the things that sometimes cost more but allow more stormwater volume

to be held on site and that kind of thing. So it can be done efficiently, it's just people that have been through the process before (*laughs*) really helped.

Elise: Earlier on you mentioned something about the IT group, sort of encouraging the sharing of resources. Either go into depth with that or describe how you share research findings internally.

Deb: Yeah. Let's see. We have, you know, certainly places on our internal website that folks can kind of go to see resources of where it's been done before. We also have a lot of knowledge articles that people can access, that's public information on our website. But our IT group is really good about making it easy to access that information and they just keep it well-organized and keep it, you know, keep reminding people that this is an important place to share the information. And kind of need that reminder and that sort of enthusiasm from that group to kind of focus our, you know, focus how we're sharing that information. And I think there's a, kind of a personal pride, team pride thing that teams like to be able to share what they've accomplished on projects. So I think that's ... you know we've ... I think ... Well we also have, you know, a kind of ... maybe ... I'm very ignorant about this but they're ... we're much more focused on social media and twitter and kind of try to share information through that as well. I don't know how often we get into the evidence-based design (*starts laughing*) component in forty characters or less. But it's you know, kind of ... sort of often attracting people to something, a report recently published or something.

End Recording on 7/17/13 due to time constraints.

Start Recording on 7/18/13

Elise: So we were talking about the IT group and how you share your findings internally and now I'd like to go on to how you share findings with the field. How you kind of share that knowledge.

Deb: Right right. That's the industry or the field in general, the landscape architecture field? Yes. So well we're involved in a lot of community organizations, a lot of industry organizations. So I think it's through our involvement with the Landscape Architecture Foundation, with groups like Urban Land Institute which are institutions specially to landscape architecture but just in general, the U.S. Green Building Council, the International Living Futures Institute. So just groups like that, the Planning Association. But basically through conferences, so we'll, you know, get particular things that we're ... we've done a lot of ... an example would be, similar to what we did in Denver for the Mariposa Green Living Initiative which Christian probably talked about. And so, you know, doing a lot of conferences about that, sharing the information, you know, publishing it on the web, publishing it onto our website. So it's out there and available for people to access. And then, yeah from the conference side it's great to be able to talk more directly to people and that usually generates folks that are particularly interested in the topic, then to have the chance to talk more one-on-one with people. So it's ... that's a good route as well. With the Landscape Architecture Foundation we've done a lot of case studies of our projects and been able ... it's a really good symbiotic relationship because I think the rigor of their process is also ... influences our process and the information that, you know, we have on projects is, you know, valuable to share. So it's a really good symbiotic relationship.

Elise: Now in the LAF case studies, there's that section about lessons learned, and Linda had always

encouraged us to phrase them so it didn't sound like a design implementation had failed in any way. And how do you ... but it's important for us as professionals to share our failures as well with the field, but how do you ... do you find that you're doing that at all, to, I guess, educate the field in general?

Deb: That's a really good question. It is hard to do that when it's in print. I think ... but I think when it's something you can have a conversation about, we're pretty willing to share that. I think that we also share it, you know ... I will often say at conferences, you know at a presentation I'm a lot more comfortable saying, you know, "we tried this, this didn't work ..." you know, because that feels more like a conversation than, you know, not something that somehow is more set in stone like a case study, which can be misinterpreted. You know I think it's the ... I think it's the ability to interpret that is lost when it's in printed word, you know. Sometimes ... versus being able to talk about it where you ... people have context for what kind of mistake it was (*laughs*) you know. But yeah, I think we're pretty open about, you know, things that have ... we've tried that haven't worked.

Elise: So where do you go from here to continue to improve Mithun's evidence-based design approach within the firm or improve evidence-based design in the field?

Deb: Well actually, your last question makes me think, you know, that we're talking ... we try quite a lot to push the limits of experimentation because it's so important to, kind of, discovering that something new or something innovative. And ... So that experimentation and that sort of atmosphere of being *willing* to fail I guess would ... it is pretty important to us. But we're, I think we're ... yeah I guess ... I guess being willing to fail within the sort of reasonable limits, but ... because we're working for a client. But anyhow, the ... I think that the next ... where we go from here, or where we're trying to go from here is really to ... we're focusing quite a lot on the evidence-based design around resilience right now. And I guess that's kind of a buzz word right now, but we think it's pretty important and that it dovetails into the much more ... what we've been doing on climate change issues and health issues and social equity issues. And so I think that's an area that we're focusing on quite a bit. I think we're also interested in the ... understanding the role that human behavior plays in response to design and the ability for those designs to be, you know, to perform at a high level. Trying to think ... We're also ... very ... we're sort of on the ground, we're interested in a lot of the noise and air quality issues. I think we're trying to ... we've been ... we have a lot of projects where we're kind of zeroing in on those as being, you know, critical components. And so we're growing our understanding of noise and air quality, exterior air quality issues. So yeah, those are a few.

Elise: And what do you or other firms think you need from the field to make evidence-based design more viable or more effective?

Deb: I think we need ... there are a few key ... well I guess I'm seeing evidence-based design as a ... maybe I'm jumping to the conclusion, I'm seeing it as a means to an end. You know, and so, a lot of ... I'm seeing it as how do you take that and make progress in the world of resilience or sustainability and so my first reaction is that it's helping to band together to highlight the codes that need to change more quickly so that we're not all trying to fight the same fights, you know, across the country, around you know, the on-lot wastewater treatment is a big one. So how could we, you know, how could we, in all the sort of water, health code related issues, so that every client doesn't have to set up their own water utility district ... common sense things.

End

Interview conducted by Elise Fagan

Date: July 23, 2013

Location: Sasaki office; Watertown, MA

Duration: 1:04:22

Elise: To start off with, can one of you please describe Sasaki's evidence-based design approach?

Ken: *(to Maggie)* why don't you take that.

Maggie: *(laughs and says sarcastically)* I've been here so long. Well in terms of what strategies, what it does and how it functions (jump in at any time), I think the idea is to ... there's always a lot of data out there and so what we really hope to do is to make data nimble and usable on different scales. So in a planning project for example, we'll be discussing acres of land but then we might want to drill down to one building's role within that. So really being able to sort of adjust and ask different questions with the same data in sort of a rapid way.

Anthony: I also think that a lot of the data ... part of our task in trying to create the tools to display the information is how do you gather all of this information, all the data that we ... from all of the sources we can find and then synthesize that and make it a very clear graphic or visual representation of what's happening, what has happened over time, what potential future implications of all of the different scenarios are, so that can inform our designs moving forward. So a big part of it I think is taking all of the data sources that are out there and being able to clearly visualize that. And you'll see some examples of that.

Elise: Can you describe what Sasaki Strategies is?

Ken: I'll take *(everyone laughs)*. I'll make an attempt at that. So Sasaki Strategies is a group we formed ... I mean it's never been a fully separate entity or anything. It's part of the planning. And I guess it's a way to differentiate ourselves in terms of ... being able to have a ... I'm trying not to use the term evidence-based because I think we use it a little differently from the way you use it. But in group there'd be more focus on the data side of things and being able to bring strategic planning which is based on the data and based on being able to visualize data and both understanding how the data can influence the design but then also understanding how data generated by the design process can feed back into that loop so that we can understand ... really being able to understand the impact of the design. And so I guess we, you know we came up with the Strategies group as a way to bring that focus to all our projects.

Maggie: And one phrase they told me when I was interviewing was that it's an "interdisciplinary think-tank," so it really brings a lot of different approaches to the problems and ...

Elise: So is this group part of each design team? Or ... I guess I don't quite understand who's involved in Sasaki Strategies as a group.

Ken: And neither do we *(all laugh)*.

Anthony: It's often a group of people that's involved ...

Ken: It's somewhat loosely defined. I mean there's a group of us who identifies as Sasaki Strategies. But then the other ...

Maggie: Yeah part of it depends on the role of the person I would say. So someone like Raj [Thiyagarajan Adi Raman] who's a programmer is doing a lot of really focused work for projects. But I've been doing some project management and working with Rick who's a landscape principal, Greg who's in planning. So ... And then we're also trying to just sort of spread the use of the tools to different areas of the firm. So Alex downstairs is not part of Strategies, but she's the one who really has pioneered Smart Plan in a lot of projects. So just ... there are people who are really within the group but the ideas are meant to be dispersed and strengthened throughout the firm.

Anthony: And so essentially I think a lot of it is ... a project team will form for a specific project and a specific series or set of issues or problems to think about right? And so there is a group of people that are brought in to that project and are an integrated part of that project team. And then through the process of trying to evaluate and solve these problems or be able to visualize the data, we end up creating tools that often can be used for other projects and in other places in the world. And so part of the group is essentially to sort of innovate and create new tools for specific tasks on a specific project. Eventually at some point, we start kind of modifying the tools so it can be more easily replicated and used on other projects. And so for instance, we may have created tools specific to Ohio State but now those tools are being used by regular project teams throughout the office in a slightly different, more modified form. So I would say that Sasaki Strategies to me is a group of people that are interested in innovating and trying to pull data and solve problems in unique and different ways. And often times that's just to inform *our* design process and also to inform our clients on what's actually happening on a much deeper level than what can be just seen or felt or characterized on campus from sort of a visual or physical standpoint.

Elise: So you would think ... you personally would think up, you know, "wouldn't it be great if we had the community's input on this, this and this?" And then you go to Ken who will actually write the software?

Anthony: Yeah so I'll meet with Ken and I'll meet with Maggie or ... and I'll say, "Ken, here's an idea ... here's the issues that are being laid out for this particular project. It would be great if we could you know, figure out a way to do something like that, to be able to visualize the community input." And then we'll have a dialogue back and forth and as a team we'll figure out, you know, what are the issues? How do we pull this? And then Ken and a couple of people will get started on creating a tool and go back and forth and we'll refine the tool. And then the ... and then we'll actually use the tool with our clients, with the community that's part of the project. And it'll inform things in the front end and then as our design evolves we'll sort of feed it back into the tool often and it'll sort of keep recirculating and refining design intentions.

Elise: So what are some of the more common inputs for this? Obviously community inputs. Do you ... GIS I'm assuming? Anthony: Mmhmm, that's a big part of it. Data? Any others that you can think of?

Anthony: Certainly space allocations. And how sort of the physical constraints about either a city or a campus or any place really, it can be down to sort of a room level like this or it could be extrapolated to a full campus. Often we work with universities who have tons of data sets on how they're using energy, how they're using the classrooms, how hyper or sort little-used some of their spaces are on campus, what groups use those,

when buildings were built, what their conditions are. But they often ... they are often individual data sets and it's very difficult for universities or cities sometimes to be able to use all those data sets and inform proper decision making, clear decision making at sort of that a board or administrative level. And so a lot of the times we're taking input that's already out there and synthesizing that so it can be displayed in clear ways to make informed decisions.

Elise: So you started talking a little bit about how it's integrated into the design process. Can you step me through that a little bit more? You said it informs the front end of it and then you go back for modeling alternatives.

Anthony: Yup, yup. So I think we can show some specific examples of that. One certainly that's ... (*to Ken*) do you have any up that you can go to? (*technical discussion*). I can think of a number of examples where we've done this in sort of an iterative process. Some of the tools are displaying, you know, initial design concepts. And as we model that, the tools are adjusting square footages or adjacencies, and so it's sort of live. And during the process you can be sitting in a room like this with all of our client group and we can be adjusting things on the fly and it's changing out sort of the bottom line in terms of cost or phasing or square footage or the adjacencies. And so we can sort of change things on the fly which is nice. But also sometimes we'll come back after a meeting and the client will give us a direction and we'll input those directions into the models and see what different alternatives we can come back with. And sometimes it'll give us very clear direction on, you know, we need to go this direction, it's the clearest, most rational approach for instance. And so it'll ...

Ken: I guess ... I mean just talk a little bit about the history of Smart Plan. I mean we came up with it because we recognized there was a ... kind of a parallel process that was happening between, you know, people who are identified as planners and people who are identified as designers. And the planners would be figuring out all the numbers and the designers would just be focusing on design. And you know there was some communication between those two worlds but it wasn't until, you know, near the end of the process they would really come together and try and you know, flesh it out, figure out what the impacts would be of that design. You know whether it be on the perform ..., financial, whether it be on looking at, you know, if it's a town, looking at the fiscal budget, looking at the sewer ... pretty much all ...

Maggie: ...traffic.

Ken: Traffic is always a big concern. And so what we wanted to do was be able to, from very early on in the process, figure out what is important in terms of tracking the numbers on any project, the numbers that will be coming out of the design. As the designs change, we want to understand what the impacts would be on things which the client care about. For the most part. So that's why we came up with Smart Plan. And I think it's most effective use is when you can get a small group of decision-makers in the room and really use it as a tool to move the discussion forward, to be able to understand exactly what the client wants out of the design in terms of the data that it's generating. And you know so it makes the design better because it gets more feasible at the end of the day and more tailored to what the client really wants. And you know, so I guess it also avoids what often happens in this industry which is, you know, if the design ... if everyone can't agree on a design, if the design is insufficiently flexible or it doesn't match those targets, what usually happens is that the design gets reworked in such a way that it loses the vision of the designer. It's usually being you know it'll ... sometime we'll

find a ... usually it's a local consultant or something to kind of ... to take the design and move it further than it's ... it loses that original vision I guess. So being able to have these kinds of tools early on in the process really helps with, I think with the integrity of the design and being able to make sure that the designer's vision actually goes through.

Elise: And do you set up these goals at like project kick off to identify exactly what ...?

Ken: No it's ... I mean I think it's something ...

Maggie: Sometimes.

Ken: Well we may aspire to it. And I think, you know, that may be the first step of it. It really is a kind of a back and forth process. It's a very iterative process.

Anthony: ... as the goals evolve.

Ken: Often the client will tell you they really care about this, you have to achieve this. But if you put this kind of tool in front of them, they'll realize that, oh actually they care about this – something which they never even came up with at the first discussion. And so that's a very interesting ... really forcing, you know, forcing people to make decisions and figure out what they, you know, if something's intentional like, you know often it's something like fiscal budget versus traffic, you don't want to put in a ton of retail even though that's great for your fiscal budget, it really hurts your traffic and that kind of thing. So any time we find any of those kind of variables that our intention ... we put it in front of the group of decision-makers, you can really figure out what matters the most.

Maggie: Yeah. Another example would just be like on a planning project, figuring out what's the overall gross square footage you want on site, what's the maximum height, and what's the open-space that you're looking for. And they might say open-space is important but if their heights can only go so high and they need to make the financials work, it might get squeezed out. So really forcing them to have those conversations in real time and see what those tradeoffs are.

Anthony: To that point, I think it's interesting that as an interdisciplinary firm, most of our projects have architects, landscape architects, planners, Strategies folks all on a team. And so versus other firms' approach where often as we do a vision for a district or even just a building project, everyone's in the room usually at the same time to flush through these ideas and these discussions. So often times, if that scenario happens, you know, the open-space could easily be one of the first things that is cut, you know. But at least this way everything's visible and transparent and everyone gets a voice. So that at the end of the day, the client's getting the best result and the most informed decision because there's all these different individuals coming to the table and being able to see their element of the project as transparently as possible.

Elise: So you do want to show a little bit more of ... (*pointing to the screen*)?

Anthony: So okay, so we can get into ...

Ken: I mean I'll just try a couple of these very short videos. (*Video begins to play on screen*) So in this case we started with a large land site. We have a fairly simple road layout and all the objects are parametric so we can calculate you know, how much ... first, you know, how many linear feet of road we have but then we've assigned costs and so we can look across different alternatives and quickly see which options are going to cost more. We have ways of simply editing the road centerlines. So the main reason behind having this level of tool was built to work at the same level as the designers were working at. Often in real time as they were designing. So you know, if they're sitting there drawing some roads, we can be sitting with the tool and drawing pretty much at the same speed that they are coming up with the designs. So that the moment you're done designing, you can pretty much get some basic measurements out of it.

Maggie: And it also links and exports to CAD so ...

Ken: Yeah it exports to CAD. And ... but most importantly I think, it links to Excel so we can run this against pretty much any existing model, the _____ model that you know, we come up with. And as we make these decisions on the design it updates the Excel spreadsheet.

Anthony: And to that point, from my perspective as a landscape architect, you know, so often a plan like this will be happening and you know, it won't be until you're in to schematic design or design development that you start putting costs to things like the road. And so if part of this was a major green park and we were in schematic design and that's the first point that the clients have seen what the cost of that road is and all of a sudden the road's, you know, twenty million dollars, often times the first thing that's going to get cut is that park. So from the very onset, a tool like this enables, you know, the client to see exactly what they're getting in to from a financial standpoint. (*Referencing the video playing*) This also gets in to, you know, zoning, there's a number of variables ...

Ken: But at the same time I think it's important that we don't try to be too detailed. I mean I think often modeling like this, you know, if you've tried to be too ... try to have it be too realistic, you can also ... it can become too clunky and not agile enough. I guess sort of you know, if you want to make changes, will it take too long? So I guess what we're trying to get is something between like a highly sophisticated model that's going to get you something that's, you know, really accurate, and something that a developer's going to be doing over lunch on the back of a napkin. You know so (*laughs*) ... So which is how so many decisions in this world get made, just ... they just know these kind of rules of thumb and can apply them. So in order to bring some of that kind of sensibility to it at the same time as being able to kind of run the numbers in a fairly sophisticate way. So it's all about finding that right balance for the decision-making process. You want ... Firstly the level of detail in the design, you know, we don't have every single curb-cut worked out at this level because we want it to be something that we can very quickly just change – okay let's try a different right-of-way and road width and that kind of thing. So it's getting at that right level for the decision-making process.

Maggie: And I've heard Greg, who's the head of Strategies, talk about this: just the idea that sometimes it's really difficult to sort of navigate that line between the detail that an engineer might bring to a project versus the planning level and agility that we want to be able to have especially in these early phases. So things like energy systems are a huge one that we would love to get in to more but we haven't found a partner that has been able to kind of understand these engineering calculations in a way that can be expanded or generalized ...

Anthony: ... scalable.

Maggie: ... scalable yeah. So that's kind of one of our next challenges probably.

Ken: Yeah I mean I think one of the things that here the software deals very well with, like a high level of precision, but it's a little more difficult to figure out ways of getting it to work almost at a human level ...

Anthony: ... a little simpler, a little more agile yeah.

Ken: ...to be able to simplify it to the point where it's, you know and I think there's a danger to over-simplified so ... I'm that's where we found Excel is extremely helpful because that ... kind of the world where people are pretty good at making models kind of at that level and being able to tie into that and have everything completely transparent to our clients.

Maggie: Yeah the people who need to see the details go to Excel and people who don't want to see ... (*laughs*).

Ken: And they can take the spreadsheet and get their results or whatever. It kind of goes back and forth. But then you still have that same live feedback when you're actually in the room with the designers. (*Back to the video*) So I was mentioning the level of detail, so obviously here we had the kind of the large land use of massive blocks and ... but we can also, if we wanted to look at one particular parcel and understand, you know, how you might actually start to lay that out in terms of some buildings; we can also get in to that kind of level. So these are, you know, very simple building masses. And we quickly design here and you know, it's also informing the model there on the right. So we can kind of mix things ... So you know, often we find that too, we'll have a very general idea about some parts of the site and then a town's interest is something where we want to get into more detail. You know, there's got to be some residential and we can kind of assign a density to it and that kind of thing. So all of the language used here is obviously, you know, very familiar to designers to deal with densities or you have floor area ratio if they are or doing a used-_____.

Elise: Would you say everybody, all of the designers know how to use these tools?

Ken: Not all of them, not at all.

Anthony: A lot do, a lot do but not all. And you know ... and again I guess our ... a lot of a project teams try to be as encompassing as they possibly can and diverse. So someone like one of our technical architects probably wouldn't use this tool. But if a team was working on, you know, concept or even, you know, SD or DD kind of level design, you know that market may be on the team but we're going to bring someone who knows how to use these tools in. (*To Ken*) Do you want to show some other examples?

Ken: Did you say My Campus?

Anthony: My Campus would be a good one. I'd also like to get into, if we can, all the Ohio State stuff that shows, you know, The Prioritizer, The Visualizer, you know, building scale, room scale, allocation of funding, that kind of stuff.

Ken: So let's start with My Campus. (*technical discussion*).

Anthony: Is that a video of Akron? That might be useful. I worked on the Akron team as a landscape architect there, so I might ... (*video begins to play on screen*) So this is the University of Akron in Akron, Ohio. And we did a strategic framework plan for them. And so this is a tool ... well he can explain the tool (*gesturing to Ken*).

Ken: Yeah, well this is just a tool ... we just asked students how they use their campus and where they like to study, where their favorite classrooms are, where they like to eat. And then also identify things like, you know, what areas do they feel unsafe. And then just general comments. So you know, it's very simple for students to fill out. And you know, it's something ... we want to make something that wasn't just going to be your typical kind of web survey, so it'll be a little more engaging. So there ... usually there are a few questions, like your more typical web survey questions.

Maggie: Basic demographics.

Ken: Basic demographics, or other stuff. But what you can start to see when you put all the student responses together is you can start to see some very strong trends. This is looking at the routes that they use, for driving and for walking. And then we can ... because we have the basic demographic data we can look at, you know, how are first-years getting around versus grad students? So it's a very simple tool. I mean I think it helps with just engaging more people in the process. But of course we found some very interesting patterns that emerge.

Anthony: Yeah for instance, to give an example of the Harvard Kennedy School. (*To Ken*) can you pull that one up by chance? (*New visual displayed on screen*). Here's the Kennedy School right? So this is an older version of the tool but ... The Kennedy School is this portion of the campus and their main door, their ceremonial entrance, their main lobby is off of the John F. Kennedy Drive here, it's off the main street. And there's a service yard that comes in and comes down in elevation to a service dock here. This is called the Taubman building. So students, we know, walk through the courtyard. There's a little parking court here but you know there was a notion of ... about a major renovation, a donor wanted to consider a major renovation to this building, you know, the main entry. And so we were curious because Harvard Square and the main university is up here, do our students and faculty actually travelling down this and circulating into the building every day through that main door. And what we found is that, we put the survey out there, and both students and faculty, when all the lines came together of how they traverse campus and get there, almost everyone was coming through the service dock, you know? So that was like a major change for the client to see that, for the administrators to see that. And then totally informed how we dealt with redoing the courtyard, this entry, and took a lot more emphasis off this door that practically no one uses into transforming this portion of the building and the courtyard. So that had a real physical change element to it that we wouldn't have known about without being able to see this data of how people actually just, something as simple as just circulating around, how they get to and from a place.

Ken: While we might have suspected that's the case, but this really helps, you know ... it helped make the case, it's just a very strong visual demonstration of what we're talking about.

Maggie: Right. And for moving from observation to more data. Just a lot of times clients will sort of challenge

some of our assumptions of you know, where the energy is on campus and we can point to it and say, “this is what your people say.” So it’s used kind of as backup.

Elise: Do you usually have those responses up-front, like if they start to argue with it? Or is that something that you respond with?

Maggie: It depends on the question. I think for general patterns like major transportation, pedestrian axes, and things like that, it’s easy to look at the map and see them right away. But sometimes it’ll be really site-specific. So on one of my projects they’re considering demolishing some dormitories because they’re saying students are dissatisfied, there’s a lot of renovation that needs to happen. And the student responses ... and then you came back something else? ...yeah ... were very different. That they love the community there, they wish the bathrooms were renovated, but it’s just the overall feeling was very different. So being able to pull out that kind of data can be really helpful too. And the comments are really great for that.

Ken: So yeah this is another one (*has new image on screen*). This is Brown. And you know ... so we asked people where they feel that the heart of campus is. And then also their favorite open spaces. And the little white dots here are all the comments that we can read that people placed. So you can see very strongly that people feel that these are great open spaces and that really the heart of campus is here. And then if we turn on some other layers such as the unsafe areas as well as, what about, problems with navigation and winter weather, so just a question about getting around. And so we’ll see that. You know even though this is the heart of campus here, people have a lot of concerns about this corner right here.

Anthony: ... crossing the street.

Ken: So it helps ... it really helps, I guess bring focus to different areas of the campus. And it helps our designers focus as well. You know, that’s obviously something that we need to find a way to address and when you get that kind of concentration of students saying there’s a problem, there’s probably something we can definitely make an argument towards addressing.

Anthony: So this is overall I would say it’s a phenomenal tool early on in a process to either confirm or deny our own intuition or our own understanding of what’s happening. Or discover new things that are issues or opportunities I would say. And you know, this is ... the two examples you’ve seen so far are at sort of a campus scale. But Ken and the group actually did this, when they first introduced the tool, just within our own Sasaki building here and it’s about how do you get to Sasaki? How do you circulate through the building? Which bathrooms do you use? Make, you know ... draw the lines to show who you most often work with. And even at a building scale, almost a room scale, I mean that was really compelling and we found some really interesting trends among what our own staff are doing within our own building which we think we all understand very well but it showed some things that we don’t often understand very well.

Ken: Yeah so we’re looking to use this tool more in the architecture firm too. You know, we see potential for it in post-occupancy surveys. So you know, we put up a great new sports center and we want to know three years down the line how students are using it whether it’s working for them the way that we, you know ... It really helps us, I guess grow as a firm to learn from our past work. So that’s one way we’re using it. Another way is ...

any time we want to do any kind of renovation or actually any new facility, you want to understand how people are using the existing facilities. And so you know, I think there's a lot of potential for pretty much, you know ... in architecture, landscape architecture, pretty much any time we have a student population or any population who're using a building or any kind of site. Anything that has some kind of geography to it I guess. Although as I'm saying that, it doesn't even have to ... it can be anything to react to. So it's a very general kind of tool. And the inspiration for this was the old boards where, you know, you put something up on the wall and you give everybody a sticker and they respond to it. We're finding all sorts of ways of using it.

Anthony: Right. And so as far as evidence-based, you know, each dot is probably someone putting ... placing that individual dot, a single individual, you know? So there's probably not much in terms of, you know, so can't really call that hard data. But when you have ... you can see the amount of responses we have and so when you stack three thousand student responses at the same general location, I think we can stand on that as pretty good evidence about something.

Maggie: Yeah we started to get statistical significance at some campuses. Especially since the tool just keeps getting better and more usable. But yeah like twenty-five hundred, twenty-seven hundred responses ... so ... Yeah definitely.

Elise: Well it's more efficient than putting somebody on the corner and watching people walk in different directions (*everybody laughs*) William Whyte style.

Anthony: (*To Maggie and Ken*) Is there anything else with this tool you guys wanted to share maybe?

Ken: We'll jump over to the ...

Elise: So Greg is the head of Sasaki Strategies right?

Anthony: Greg Janks, yes.

Okay. And do you meet with him on a regular basis to discuss new ideas? New tools? Refine different strategies?

Anthony: Well that's sort of interesting is Greg's ... he is a planner, and he's a principal and he's a planner so he has a number of projects that he's the head designer or head lead of. He works for a lot of universities. Brown: he's the principal in charge of Brown. So you know, he has his own teams for specific projects and we implement these tools and together we come up with solutions and things. But he is also directing the Strategies and the sort of firm-wide approach to this evidence and data-driven design. And so he's leading efforts that aren't part of specifically his projects. I would say. You know and his ...

Ken: But I think, as with many things at Sasaki (*Maggie laughs*), we ... it's not a very hierarchical structure here generally and ... So you know, if there's a new initiative or something, it's up-and-coming from somebody else and ... You know so ...

Maggie: ... and from a project.

Ken: Yeah.

Maggie: ... the needs of a particular project.

Ken: So I mean, I guess there's not a ... it's not a very ... there's not a lot of, kind of very strict oversight I guess. I think you know ... On project work, things kind of happen as they happen, to a large extent. And we kind of like it that way, because it allows innovation to happen in interesting ways. And you know, if we were to say that, you know, in order to use Sasaki Strategies you have to start six months out of something, we'd basically ...

Maggie: ... wouldn't exist (*all laugh*).

Ken: ... would never have come to any of these tools because it's always kind of the last minute things that somebody comes up with a cool idea on a project and we have to get it done within two weeks (*all laugh*). So ... but that works well. That's where all the, kind of, most interesting innovations happen.

Anthony: And so usually it's not Greg, you know, sitting at a lunch thinking about all the great things we could do (*all laugh*). It's usually, you know, someone on the teams, like Ken, who comes up with an idea about how to solve one of the problems he's heard about on the project.

Elise: So how do you share that then? So you come up with a tool for your specific project and then it's usable on any scale or you make it that way, how does that get shared with the rest of the office?

Ken: That's ... yeah, that's something which we, you know, we give presentations once in a while. We have this site (referring to the screen displaying videos of the tools) which I don't think too many people visit (*all laugh*), which is, you know, outlines everything we have and everything we're kind of coming up with. And a lot of it's just word of mouth.

Maggie: Yeah.

Ken: Provided we have enough people ... you know, if somebody works on one project and we usually have fairly big project teams so there's a lot of cross-pollination between them. So if you somebody, you know, somebody works on this project and they've used one of the tools and then they see a potential for that tool to be used on another project, then that's often how it spreads. But yeah again, it's one of those things where it's very hard to like ...

Anthony: ... it's organic.

Ken: Yeah it's kind of more organic. It's very hard for us to broadcast in a meaningful way so that anybody's going to think of it next time they have a need for it, unless they've actually seen how it's used on another project. So again it's hard to do if you've got a top-down direction.

Anthony: But it's also how the tools continue to evolve, you know. Someone will see it or hear about it and they'll ask Ken about it and what they had in their mind about what ... how the tool functions or what its

aspirations were may be different from what the tool currently does. And so then the tool gets modified or added on to in more layers and gets more dynamic. And so it's kind of a nice way in that regard that it's not: here's what it is, here's all it can do. It's ... I think even just the word of mouth often helps grow the tools and make them more useful over time.

Elise: And can you talk a little bit about this site? This is a library for the tools? A how-to kind of?

Maggie: Yeah library's a good word for it.

Ken: Yeah, it's not a how-to. I mean I think we just don't have the time to maintain anything that's going to be comprehensive and kind of stand-alone. I mean so we came up with this site just as a way to share everything that we're currently involved in. So we kind of arrange it by, you know: these are all the established tools which we pretty much use on, certainly not every project, but we, you know, we use these a lot.

Maggie: They're ready to go more or less.

Ken: They're ready to go and it's kind of you know, someone can pick and choose. And then I have a section here which is emerging and experimental. Which we've *kind of* used in a project but they're not, you know, it's not like we can readily apply them to the next project. And some of these actually, like Crowd Gauge for example, is not going ... we can cut and paste that across because that is something which we've ... it's more established, we can, you know, set that up on future projects.

Anthony: And then there's the last category. (*all start to laugh*)

Ken: And then the last category are tools that are looking for their big break and these are just the ones which are rarely ... you know, they're just sitting there on the wings and waiting ... (*all laugh and chip in*)

Anthony: waiting for some project to...

Maggie: ... to make him a priority.

Ken: So we have a lot of those, those kind of tools.

Elise: ...heading for retirement.

Ken: those are the ones I really like (*laughs*).

Anthony: Do you want to go into something like The Prioritizer or The Visualizer?

Maggie: (*To Ken*) How many projects did it take for Crowd Gauge to become an established tool? Was it just two?

Ken: Yeah, well Crowd Gauge is actually quite interesting. We came up with that on a regional planning project

for Des Moines. And it was, you know, it was fairly successful and then a group who developed planning tools approached us to open source it. So you know, basically just paid us to take that same code-base and put it ... make it more portable so that we could open-source it. So we helped them with that and then they've used that tool on a couple of their projects. And we've since used that for Northeast Ohio, another regional planning project. So yeah I mean, so you know, their ... we came up with the tools, someone helped us open-source it and then we've taken that same code-base and kind of helped push it a little bit further on a new project. So that's a new model for us. Most of it's all internal development in that case. We've actually open-sourced one of our tools so that anybody can pretty much create.

Maggie: The Visualizer?

Ken: The Visualizer! (*all start to laugh*)

Anthony: We have some interesting names for these.

Maggie: Yes. Unfortunate suffixes.

Ken: Yeah and I get blamed for all of them but I shouldn't be. Ohio State client was the creative ...

Anthony: So this is Ohio State's campus. You know, it's the second largest university in the country. And so trying to ... our goal when we started this masterplan was to create one university that operated and sort of used it's combined power to leverage that to keep propelling them to be one of the world's greatest research universities. So you know, and traditionally this campus, like many campuses, has a series of colleges and the deans have their own budgets and sometimes they have their own managements, maintenance staff – things are very silo-based. And so often times, you know, whoever has the loudest voice in the room, whoever bangs the table the most got the funding and resources.

(*Greg Janks enters and introductions are made*)

Maggie: So I think we've done a good job of misrepresenting your vision.

Greg: I didn't mean to interrupt. No, it looks cool (*referring to the displayed tool*), can I buy it?

Anthony: So we tried to essentially, with that goal of creating one school and trying to move things together in a very transparent way, the group created these ... this series of tools that provide all the data sources that they have at Ohio State and make them in very clear and concise graphics so that you can, and these are all very interactive, so that you can at any point be able to search and display real-time data on specific buildings, specific programs, adjacencies of academic units, the amount of maintenance a building has, the, you know, research funding allocations specific departments have. So that the entire campus as a whole can really be looked at very clearly from an administrative standpoint as they try to make very clear data-driven decisions moving forward on who gets what kind of funding allocations, what projects get priorities. And as projects have priorities, all the necessary elements that are required to make that a reality. So this is sort of a Suite of Tools that enabled the university to do that. Greg if you want to ...

Greg: That sounds right to me.

Maggie: And the video might illustrate it.

Ken: Yeah so ... so what we're seeing here on the video is the facility condition for all of these buildings. And so ... I guess we should mention, so a lot of the data that we are showing in this tool is data that they already had in various systems. So this is a way to pulling those together. And then some data sets such as this, they didn't have a good system for that, so we actually give them a tool they can take out in the field and gather this information. And there's a kind of three-year cycle of updating this information. So they visit every single one of these, whatever nine hundred buildings, on a three-year cycle. So they've got the latest information to help make the decisions. So you know, they can take any of the buildings and they can see a breakdown, a kind of a high level. They get a composited score but they can also look at all of the different systems and how they are performing. So there's quite a lot of data they have on all the buildings and we wanted to be able to role that up into kind of an overview available but then they can also look at more detail. And it has some of the existing data sets. So this is looking at room codes, so that you know, which are research and lab buildings, which are office buildings, etc? And that's just based on the data they have on all the rooms and we kind of rolled into that to a higher level for this kind of picture. But they can also drill down to varying levels of detail. And so yeah, there's also a predominant view looking at the college in this case, so which colleges are in the buildings. But they can also then look at one particular college and how that's distributed across ... because often you'll find there's little pockets of that particular college that are distributed to other buildings which you might not see in that previous diagram which is just ... You know, which are the main buildings that they ... (*new visual appears on screen*) So we can also look at it as some simple stacking diagrams so you can get a sense of where are all the departments of College of Engineering are and which buildings they're in. And then you can go right down to the floorplan level. And those aren't real floorplans, that time we don't have floorplans just kind of blocked them out. So they can look at it colored by, in this case, so the room code, that's office, lab, classroom, etc. And here we're looking at the research expenditures in dollars per square foot. (*video continues to display new diagrams*) So going back to department and ... So that interface is used to apply different, I guess color sets in the building so you can understand where classifications. But then we have this tool which allows them to look for more specific information and so if they just wanted to look at all the open labs in the college of engineering, which have a certain range of research expenditures, they can create those filters. It's kind of like, you know when you're doing online shopping (*all laugh*) and you're trying to find ... the right buy, so whatever it is you can set these different ranges and create that database and it'll show you just things that match those criteria.

Elise: How would something as specific as room codes inform a design decision? Can you give me an example of that?

Ken: (*To Greg*) Can you give a real example of that?

Greg: Well sure, what are you designing?

Elise: For this particular project, it looks like you have a lot of initial data, but that's just because the college had ... the university had that data. But how ...

Ken: Yeah and most universities are required to ...

Greg: So the room code is describing the type of space. So using some kind of analysis tool to look at how much classroom space they have, how much office space they have, etc, etc, would then completely inform the program of the new facility and that'll tell you what you may need to design.

Maggie: Or it may show you opportunities to better use existing space. So on the research expenditures piece, a lot of investigators will retain their lab space even if they're not receiving grant funding. So to give the university a toll to say: these people have money to spend and no place to go. And to consolidate people who aren't being as efficient with their resources.

Anthony: And something like this, I mean a simple example of this is, you know, for us the most sustainable thing you can do is not to build a new building. And so if, let's say that there's a department head that says, you know, "we need new lab space. We need to build new ... we don't have enough room." And so here we could filter all the rooms that they have, we could see the condition of those rooms, how they're being stacked in terms of time and their utilization. And sometimes we can find opportunities to say, "no, you actually don't need a new building. If you renovate two of these that aren't being well-utilized or are not in great condition, you can get all of that for half the dollars. And you're not building a new building and using all these resources." You can sometimes find some unique ways of exploring what the problems are with just a little thing like this that displays data.

Ken: And they can inform very creative design solutions. *(To Greg)* What is the story here about the two buildings that they were going to build and then they figured out, or we helped them figure out a way to do it that's one building?

Greg: Well the chemistry department thought they needed a new building so they hired some architects to do a feasibility study. And much everyone's surprise the architects said, "you do need a new building! And it's a big building." *(all laugh)*. The chemical engineers thought they needed a new building, so they hired some different architects and much to our surprise they obviously came back and said, "you do need a new building! And it's a big building!" And this was all going on against the real trick of, you know, increased collaboration and interdisciplinary blah blah blah. So the programs were very similar for the two buildings. By combining them there was about a seven thousand square feet savings in just pure redundancies. Obviously the research collaborations were much stronger. And in turning it away from sort of a single or new building project, making it exactly as Anthony's described into an idea about, okay let's look at the existing building stock, which buildings actually want to be lab buildings, which buildings have another use, which buildings actually have reached the end of, or plausible useful life? So four buildings ended up being demolished, two buildings are being renovated, a new building's being constructed. Overall square footage is actually going down, operating costs are likewise going down. But we're not compromising on any program calls. And in theory, from an academic perspective, should keep it at performance. Those kinds of analyses and moving, on just ... purely on the political front, moving, you know, diverse sets of stakeholders with strong opinions towards a common solution is not possible without a, kind of, data-driven approach. Which ... and then everyone ends up winning so it's a good ... it's one of the few successes in life *(everyone smirks)*.

Elise: And I'm assuming that the client came to you knowing that they're getting all of this analysis? Is there ...?

Greg: Not completely. This is a particularly complicated story. But we had a significant degree of trust with this client. And when it came to the tools, it was more ... almost a handshake agreement. I mean, we knew what the problem was, we knew that with, you know, Ken's leadership, we could give them some very good solutions. So we talked about it quite a bit and then at the end we said, "is it okay if we think of these three pieces? And we think they're going to be something like this. Do you trust us?" And they said yes, and we kind of ... So we didn't do a huge pre-spec or anything like that. You know, or any of the things you would normally do in ___ sorting? ___, we didn't ... it would have just totally killed it in terms of the timeline and probably to some degree in terms of functionality. So it ended up working really well. Which is a kind of tool-specific answer. If we step back and think more of the kind of analytic perspective, you know, it's always a question of meeting the client where they are, seeing what data exists, what data can reasonably be assembled, realizing that it's all completely hopeless and then once you've, you know, pulled yourself back off the ledge, figuring out how to do the best you can with what's available and move the needle. That's kind of half the fun of it.

Elise: Is there ever a time where you have a client who's stubborn about (*Maggie laughs*) wanting to spend that money to do a lot of this analysis and evidence-based tools?

Greg: I think more and more folks are sort of seeing the value in it and are very grateful for it, very hopeful for it. So we're not really encountering a lot of resistance and you know the ... I think as we gain some traction with it, it's sort of ... folks are coming to us specifically because they know that if there's marriage to the sort of traditional ... That's the real part of it is, it's not just analysis and it's not just design, but it's bringing those two things together that is really the value of propositions.

Maggie: I was going to say that the answer was yes. But maybe I'm thinking about it in terms of data maintenance and data collection?

Greg: Clients that don't want to go to this extreme?

Maggie: Right.

Greg: Yeah I do agree with that. I mean there's a certain amount ...

Maggie: So the clients that have the data would look to see if ...

Greg: I don't know ... I have yet to have a client who's opposed to some form of data-driven analysis. Sure there are clients who ... it's not, you know ... don't necessarily feel that they need to go to this level. But ...

Ken: Certainly smaller schools get less ... I mean you know, I think you can keep things in your head more readily if you've got eight buildings than if you have eight hundred (*all laugh*). But you know, I think as things scale up, these kind of tools, you know, which in this case it's not even about ... it's not directly tied to decision-making, it's just about understanding what you have so that you can make a better more informed decision.

Greg: Even with the eight buildings school there's analysis that can help inform decisions even if you don't necessarily support the whole Suite of Tools.

Ken: That's my segue into this ... So in this case ... So The Visualizer is very much about ... So The Visualizer is really about understanding what you have and you know, it can help you figure out what you need to do. And this is The Prioritizer (*referring to the screen*) which just ... so once you've come up with that laundry list of things that you'd like to do, this helps you figure out how those align with your stated goals so that you can make more informed decisions about how to actually achieve those. So the way that we've organized this, every single item that you see here is a potential project. And then we have a number of little pie charts here which show how well, for example this is the higher union replacement, and it's being scored in terms of how that contributes to all of these stated university goals. So this is advancing the art district, this is advancing athletics and recreation, etc. And so you can quickly see which of the projects are contributing to those goals and then, you know, in some cases they're contributing only a little bit. And a lot of these are just subjective, in this case the university goals, all the data is, you know, you just sit down and have a discussion and come up with a number. But we can also bring more concrete data to this like what's the replacement cost going to be or what's the ... (*to Greg*) what is the other thing we can do? How does this contribute to lowering their deferred maintenance and that kind of thing.

(*referring to a new visual on screen*) Anyway, so here's a ... just a list of ranked projects. These are the sliders that represent the goals. And then those are the scores for each goal. And then ... yeah so each of those columns corresponds to one of the sliders. And then as we play with the sliders ... so that's just showing how to heighten the score. So as we play with each of these sliders, it just resizes the weighting for each of those goals. So as we, you know, increase one of those, it just reshuffles the list and it's just a simple algorithm that just repopulates. Basically each of these weightings that we're applying, you know ... which projects are contributing most to each of those goals. So then we don't let the computer make the decisions, again it's ... you know, these are tools that are supposed to assist in decision making. So it's not just picking all the projects, we can still go through and you know, it's kind of informing the decision, but we can go in and pick which projects we feel are important. And in order to achieve some of those projects we, you know, we have to, for example ____ bolder ____ blonde _____. So projects also know which other projects they depend on.

Anthony: (*Referring to a new visual on screen*) So yeah, this is a timeline of building these things.

Ken: So then we actually want to figure out, you know, how we can get this done given our budget constraints and when the money comes in. In this case it was kind of interesting because certain projects can grow from certain parts of money. So there were some cultivations that had to be run in order to figure that out. Or give them a way to just ... be able to drag the projects on a timeline and figure out whether the allocation was feasible. So this is showing that ... above the timeline here is showing you the amount of ... the cumulative funding that's coming in and then we need to make sure that our projects don't ... So what you're seeing there is the cumulative expenditures in the black line. So you have to make sure that you ... in order to have enough money you have to make sure that you're black line doesn't go above your ... the other line. It's also showing that this particular ends and another one can to be built, so we need to make sure that we phase it after that project, otherwise it'll give us a warning. It also will show us one _____, even though there's enough total money available, it can make the allocations from the given funds given the constraints.

So I guess the bottom line is that it's a Suite of Tools that's not ... that's trying to support the decision-making process. And in many cases, you know, it just helps give you that high level of feasibility. You know, again, it's not trying to run the models in any great level of detail but it's trying to get ... or rather the suggestion where you all get around the table and figure out how, you know, that you want to do this project, this project, this project. And then somebody goes back, runs the Excel ... the numbers in Excel and they figure out, "oh okay well I can't make it work. We can't get the right funding allocations etc." So then you, you know, then you have to schedule another meeting, everyone get around the table again, do the whole thing again. So, you know, just being able to get everybody around the table with a tool that's giving you that immediate feedback, I find is very valuable.

Elise: To move on ... These tools are obviously an important part of your marketing strategy, to be marketable as Sasaki Strategies. Do you ever share these kinds of things? Maybe not the tool itself but lessons learned with the field.

Greg: Yeah, I mean again, the tools are almost incidental to the approach right? And the goal is: how do you craft a strong analysis function to support planning and design decisions? And it's 2013 so sure we use computers to do part of that. But in terms of where that's leading us, absolutely, we write for major organizations, speak at major organizations. And you know, our goals are humble, we just want to redefine the field that's all (*everyone smirks*). You know, what is a plan? What should a plan be? How do you take it away from something that's sort of static and frozen and unable to adapt to changing circumstances and turn it into more of this sort of ongoing process that's able to nimbly adjust as new opportunities emerge? You know, how do you try to measure things that can be measured and how do you try to incorporate the things that can't be measured within an analytic framework? So you know, under those kind of broad topics, you know, we share and speak about them all the time. I don't know if anybody's listening but we're trying. We're trying ...

Anthony: And all of this is relatively new. I mean even within our own practice, it was five-ish years ago that we were ... five or ten years ago that we were still doing masterplans as a static document. You know, we'd do space projections, renovation requirements at the time, you know, and we'd draw, you know, boxes and rectangles, you know, grow this way, new buildings here, or new street alignment here. But you know, we often just kept finding that a few years out, those findings are out of date, you know, they're not relevant anymore, they ... because some circumstances happened so they shifted. So with this long process of doing a masterplan and now it's not useful anymore. So I think our entire goal is to make, rather than a static document, a living, breathing, constantly editable, kind of framework for decision making for ... So yeah. Really a lot of this is pretty new in the field in terms of planners, landscape architecture, architecture firms. We're seeing a lot of new surveying technology out there but ... It's really sort of like this holistic ... tied to financing, tied to allocating things over time, scheduling; I think that's relatively new. So you know, Greg, a number of folks are speaking at APA conferences, writing a lot of publications. Sometimes we give lectures about this at universities and so on. I think we're getting it out there as much as we can.

Greg: I think there's equally a hunger and enable some folks ... You know, any change is difficult. But overall the reception is overwhelming.

Elise: So where do you go from here to improve Sasaki Strategies within the firm or improve evidence-based design in the field?

Greg: I think we definitely, I mean most of the Strategies group today is being kind of campus-based and to some degree planning but it's ... we've done some good work in other sectors so I don't mean to say it hasn't been _____ up in those areas. But we'd love to take the mindset and, you know, apply it more to built-work projects amongst other things, _____ in some ways. And get at different market sectors and I think some of the initial returns on that are really encouraging. And you know, everybody's in favor of evidence-based design ...

Anthony: And a lot of us are really interested in how we can start to utilize tools on the design and for a built project, even as something as simple as a park or something. Certainly with all the, you know, Sustainable Sites Initiative, LEED certification and you know ... Something as simple as designing an allée of trees and giving that an input of how much carbon sequestration those trees at a certain age will ... could provide ...

Greg: ... not a lot. (*Everybody laughs*)

Anthony: Not a lot, but, you know, we could display that information and clearly see that and you know, and actually if you want to achieve a certain target, we're going to need seven-times this, and very quickly be able to let that sort of drive some initiatives. So I think we'll start to see more and more of that kind of input into our built practice as well.

Greg: Yeah and I mean I think one of ... you know, one of the things that we've seen is that when you approach design problems from the bottom up, sort of the fantasy version, like "what would you like?" "One of these, one of these, one of these ..." You know that's great. But it doesn't necessarily advance a solution. When you come at it the other way from "within these constraints, how would you like to solve the problem?" You can be a lot more effective. And to be fair, there are elements of ... you know, there's an aspirational [kind] of quality of the first approach that you don't want to completely lose. But having both perspectives is really important and I think sort of fundamentally change the design process for the better.

End

Elise: So when did evidence-based design first emerge at the firm.

Joe: I guess it depends on your definition. My first understanding of evidence-based design here was that it goes way back to the 1970s when Ian McHarg had established an overlay system of analysis for environment and natural resources. And that system was being experimented with at Harvard at the time as well. And there was a fellow there named Doug Way. And his analysis was ... techniques were applied to a major project in Hilton Head, North Carolina. And so Hilton Head is one of the first projects that I know of that had, you could say, research that was being done in school translated right into built project. We also did, I think, in-house research related to planting trees on Pennsylvania Avenue in the ... that was also late 70s, early 1980s. This was before there was the Street Tree Institute at Cornell and people like Nina Bassuk had been doing their work, this was well before that. Within Sasaki there was a group who decided we were going to look at ways to plant street trees, and underground irrigation and drainage system for street trees on the Avenue, was developed. Is that the kind of thing you mean when you say evidence-based design.

Elise: Yeah. And of course evidence-based design has evolved over the years from going ... going from like a William Whyte strategy, very observational, to using the tools that Sasaki has here. I guess, when did the formal strategy of Sasaki Strategies emerge?

Joe: Oh probably five or six years ago. Yeah. And my understanding is that ... and it may not be the same since I'm not embedded in Sasaki Strategies, but my understanding is that what they have done is taken traditional planning and design problems and then applied technological solutions to solving them. And so the power of computing has allowed us to ... and the power of computing has allowed us to investigate as well as, how do you say, demonstrate to clients information that only could have been done sort of intuitively before. Now you can actually create a database in a very short period of time with minimal effort and make your point. And create compelling graphics and compelling details to explain what you're doing. So in that sense it's made design more rational, it's made it more transparent. Like you don't have to simply trust me to say that, you know, this kind of environment is going to be better for student gathering. I now can show you evidence that that is the case, to take a campus model example.

Elise: How would you say the approach has evolved primarily since late 70s, early 80s?

Joe: Well I think that the thing that's introduced is technology. When ... I mentioned the overlay system of graphics, are you familiar with that? **Ian McHarg? Yes.** Yeah McHargian sort of methodology. That was all done by hand. Laboriously tracing aerial photographs. And now you can do the same thing just going to online resources in probably a tenth or less of the time it used to take back then to do the same thing. So I think in every respect, that's the one thing that transformed the profession in the last thirty years. There's the full embracing of technology in the middle 1990s.

Elise: And you would say that's primarily true for the firm itself?

Joe: Oh yeah. Yeah, yeah, definitely.

Elise: How do you get your designers to share in this mission? Obviously it's part of this Sasaki culture ...

Yeah I think that it's not difficult if people are just aware of it. And anybody on the team can say, "hey there's a way of looking at this. Let's try to do a My Campus exercise to gather this information to see how it works." But I don't think it has ... it comes from ... or there's any persuasive activity that needs to take place that people do it. I think that the ... whoever's leading the design team has a role to play in identifying what we need to do, what we need to understand and what kind of analyses need to be done that are relevant to solving the problem. But once that's set, it can be anybody on the team who really says, "oh here, here's a way of getting that information." And in fact it usually is younger, more technologically-savvy people who can do that better.

Elise: Can you please describe how the approach has or has not affected office design culture?

Joe: Well it's ... when you're in it, you don't see it as affecting it. So that question is for someone standing outside. And I guess when you're in it, it ... you're not monitoring day-to-day or every ... how is this affecting us? Or how is a certain way of working affecting us? So ... But if I were to just maybe step back in time and say, "how has Sasaki design culture ... or how is Sasaki design culture maybe different from someplace else?" Sasaki design culture has rarely been about isolated individuals working alone. And that goes back pre-technology, and it's true today with ... And the speed of technology just makes it that much more difficult to be sort of an isolated individual designer. I mean you could still do it to some degree. And that's not to say that individualism and individual talents aren't recognized. It is individuals who make decisions and initiate designs. But it's to say that more normal cultural sort of cross section at Sasaki is teamwork. It's people working together and contributing ... and feeling that we're all part of one problem solving exercise and working together. So that's probably the attribute of Sasaki design culture that is most obvious. And then I think that evidence-based design and sort of technologically-driven fact finding just blends right in to that, if fact you might say it amplifies that even more because individuals ... because things happen so quickly and information assembles so quickly, no one has time to go off (*laughs*) and you know, work on this for a couple of days by themselves. Whereas before you used to have to do that.

Elise: What about to the office spaces themselves, have those changed over time? To do collaboration ...?

Joe: Well they've changed but I don't think ... Yeah I'm not sure why. That's more with the ... that's more a response to certain individuals, the way people think we ought to sit. But we have always been an office without offices from the first time I came here in the early 80s ... late 70s, early 80s. There were never any principals who sat in offices and the rest of everybody else ... I mean it was all open floorplan. And we always had work tables. We always had joint work session locations. I think that there's been a little bit more breaking down of the individual cubicle. So we now sit in these pod groups, which are a little bit more, a little bit more dense than before. Which for some people is fine. Others who require more space, it's a little bit different. And if you require privacy, it's not the greatest arrangement. If you want it to be quiet while you're trying to do math or writing it's not the greatest. But to me the key thing that has always been at Sasaki is the big workspaces, the collaborative

places. And we always ... if we would get a big project that would run for a given duration in the project, we always set up a project team pod for that. So I think where we are today is kind of an evolution of where we've been, it's just taking a slightly different form in that the cubicle wall between people have gone away.

Elise: Can you please describe how the development of evidence-based design in the firm or in the field in general has or has not changed firm structure?

Joe: Well I guess that when you say ... I don't think it's changed the overall organizational diagram. I think it's changed who's in the diagram, like people like Greg Janks who are, let's say, non-designers, non-planners by background who... but have good organizational skills, great computer skills, has a mathematical and financial component to his background; he adds another dimension to Sasaki. So that's not organizational, that's just bringing in another type of expertise. Right?

Elise: Okay so talk a little bit more about new positions or ... Is there like a new department, a whole field of people that have come in since Sasaki Strategies and the evolution of these tools?

Joe: They ... We've made hires into Sasaki Strategies of ... Well if you could trace the roots of where Sasaki Strategies started, I think, for many years, Sasaki has done campus planning and one of the components of campus planning is to determine what the future facility needs of a university are going to be. So if you're the dean of the college of liberal arts and sciences and you say to your president and then to your masterplanners that the college of liberal arts and sciences needs a new humanities building, or we need a new social science or we need a new math building, and that's your conclusion as the dean. In order to persuade people to build those buildings, whether it's a state legislature or donors and so forth, you had to go through a justification process, what's referred to as programming, masterplan level programming for facilities. And we used to hire specialists who were sub-consultants to us to do programming. So we would hire a guy, and they're usually one-man firms and that kind of ... we would hire someone who would come in, we would be doing the overall organization of the masterplan and this person would then, using normative standards and their understanding of the physical conditions on that campus, they would provide a facilities program. And there was always a tension between us, the physical planners, and the more abstract exercise of programming. These guys were always sort of like accountants and they had a very linear, numerical mindset and were less involved and interested in the overall spatial organization of the campus. So what we began to do was hire sort of people who had planning background but had some of the abilities that these programming people had. And we grew them and said, "okay this is what we'd like you to do." So we get a new guy out of MIT (he's now our principal) and said, "Greg [Havens], we'd like you to get involved in academic programming, space programming." And he learned it. And it's not that like we hadn't watched these consultants do it time and time again, how they did it, and what their methodologies were. So we got into programming and did the programming ourselves. Now there are planners coming out of the better schools these days who sort of have that bias in their education and their background. And those are the people that we're hiring for Strategies. They usually come in ... and you know we have this big campus planning practice ... they have to earn their living somehow day-to-day in the office, they do it programming. Most of them really know programming quite well. They're numbers people, they can go through ... and then we put them into a physical design team and integrate them so ... And the advantage of that is that ... let's say from a numbers point of view, you come to the conclusion that you need more classrooms and ... but if you've done the physical analysis, which our planners have done on the campus, you may find that

you really don't need more classrooms, you need more *right sized* classrooms. This guy is dealing with gross numbers. These people are saying the problem is that we have classrooms but they're all the wrong size, we need to modify the physical space, we wouldn't have to build new. So there's this connection between planning and programming that we now can facilitate.

Getting back to your question, those people ... I think because of their data processing skills, they're data ... they can compile, organize, analyze data in a unique kind of way that most ... a typical planner doesn't. They start to contribute in other ways to projects as well. But they ... that sort of all evolved out of programming. And then you have a guy like [Greg] Janks who has a financial background. And so we can begin to take our plans that we developed and evaluate them financially, which we never used to be able to do before without ... before Sasaki Strategies. I mean that was a function that was normally done within the university itself by the university CFO, by people who were running the university. And it varied just as universities vary, the capability and the capacity of universities to do that themselves, you know, varied considerably. I think what we do now is bring in outside objectivity to that task where we can do benefit-cost analyses for different planning moves where we were never able to do that before without those ... that sort of cadre of individuals.

Elise: And what about Ken Goulding? He's a software programmer? Do you have a whole group of those or is Ken pretty much it for ...?

Joe: I don't know. I think that the other guys could probably answer that question better, if there's anybody else in that group who does programming. I think it's mostly Ken.

Elise: Can you describe what impacts you have or have not seen to the types of projects or clients that you've received over the years based on this evolution?

Joe: I don't think the client types have changed. I think that ... I think that the work we do is fundamentally the same but it has a new dimension, it has maybe greater relevance to a given client's needs. The dimension of it has changed. But like for example, I just said in a programming and financial analyses as this sort of backbone to physical planning, I think those things are more robust than they used to be.

Elise: So a lot of this research takes time and money obviously. Can you discuss how you make research in practice profitable?

Joe: I think we do it as part of problem ... solving the problem. It's not basic research that we're doing, it's very specific, targeted ... If we want to know where the students at Babson College eat lunch, we can find that out and so ... And it's something we want to know anyway. So it's something we would do as part of the exercise to begin with. So it doesn't cost any more. And that's a service you're being paid for. I think if we were doing more generic or basic research, then you'd have to worry about who's paying for it. But I don't think we are at this point. Everything we're doing is pretty targeted ... it's integral. Yeah, with a task. And if we have to invent something, I think it gets invented as part of a project. I don't know of any initiatives right now, there may be some where we're trying to invent something for a given purpose but we're not applying it at the same time.

Elise: So how has the business model changed over the years? Or maybe marketability? Marketing strategy?

Joe: Oh marketing. Well I think ... if you ... The way we get work, as you know, is we can find our way on to a shortlist and then we have to go to a client for an interview. So that's the point at which you need to argue your relevance and argue how ... why you? And having these tools and having these examples of how we have helped other clients similar to these, is very persuasive. But it's not just showing them the methodology and the tools and so forth, I think it's *what* it is that makes it attractive. So by that I mean, every firm will go in and talk about physical planning because that's what the project is about, we want a ... I'll keep using campus planning because that's what I do, we go in and we explain how we've done the physical plan of a campus but there aren't too many others who can market as effectively in terms of what are the financial implications of that physical plan? We can show how we looked at three different alternatives for a plan or arrangement and building organization, and evaluated the financial consequences of each one. If I'm on the other side of the table and I'm the chief financial officer of the university, I'm saying, "gee they not only do physical planning but they've taken it to a level that really interests me because that's what I would have to do anyway. *And* they're doing it in process, so we don't ... it's not something I'm going to be handed a plan at the end and asked if we can financially do this. We're going to find that out along the way, it's part of the decision-making process." And the same thing with programming. I think that being able to organize and develop a variety of programs, demonstrate them, test them with people along the way, is so much more effective than again, coming up with a plan after which someone says, "well gee, this isn't really what we wanted, it's not what we need, and it's not going to work."

So I think we're making ... planning is fundamentally a decision-making process, that's what it is. And what the Sasaki Strategies, sort of technology-enabled Sasaki Strategies does is makes that decision-making process more visible so people can participate in it much easier. And the information that you need to make decisions is out there and if you want to change the information to run different model scenarios, you can. So that's simply what it is (*laughs*). And you can market with that.

Elise: How long have you been at the firm?

Joe: Since 1979. 34 years.

Elise: Can you talk a little bit about what your design process was then compared to how it is now?

Joe: Slower (*laughs*). I mean it was time back then. Things didn't move at the pace they do today. But the process is fundamentally the same. You have ... you have ... you have a client who has a need of some sort and you have to first validate the need and make sure that they're ... the right question and that in fact what they want you do is what ... is in their best interest. So you have to discover what the problems are, in what they've sort of set ... or if they say something as generic as, "I need a campus plan." What is that? So you have to go through the process of finding out what that is in that particular case because in every case it's different. What the needs of one little college versus one big university are are very different. So *that* hasn't changed. You still have to ...

Elise: But finding those needs seems to have changed from when you ... we didn't have all of this technological tools to do it and now to do it and now to Campus ...

Joe: There's a lot more data. And it's very helpful ... My sense is that you can get the data faster. And getting the data is not only a process of just sort of bringing stuff in, it's a process of bringing it in, looking at it, and either getting rid of it and saying, "that's not relevant, that's not relevant, these are the pieces that are relevant to this problem." It sped up that process. But it's allowed you to sort through the stuff and it's also created *more* stuff than you used to have to ... have to deal with. Because there's so much more information available. You can answer questions, so you do. You can just go onto Google Earth and do your site analysis from here without even going to where your project is. You could do a *credible* evaluation of the site without even going there. So I think the information, the amount of information, and the availability of information gives you more to work with. But I still think you have to exercise a judgmental factor of what's important and what's not. And that's still, to me, the key intellectual ingredient. Not everybody can do that. A lot of people can gather a lot of information and array it all out and say, "here, look at this, look at this." Then you have to ask the question: What does it mean in the context of the problem we're trying to solve? And is it meaningful at all? Or is it just there? And that sounds strange but it's true (*laughs*). A lot of people go through motions of stuff like going through a design process but there's no thought involved or judgment involved. So I think that the technology, the data gives you more to work with, but you still have the fundamental decision at some point to do is to: what is the significance of what you're looking at? And is ... are some pieces of information more significant than others? And as you learn more, will something that was insignificant in the beginning become significant as you proceed? I mean that happens all the time.

Elise: Would you say the design creativity has diminished because we're more reliant on tools and hard-fact decision-making?

Joe: No. Because I think the creativity ... Creativity is an exercise in finding meaning and finding significance towards a particular end. Discovering something, discovering relationships, discovering intelligent patterns that work to solve your problem better than others. And so that doesn't change. I think that it speeds up, you get more information, but you still have to do something with it. You still have to do something creative with it. And so I don't think it's changed the ... yeah it's changed it but it hasn't fundamentally changed any psychological function that has to be performed at some point. I think that it's ... I think that the designers of the past had a little bit more luxury of time, not in all cases, not in all cases because the speed of the design process is relative to when you're working, you know. If you read correspondence of Olmsted and those guys who practiced in the late 19th and early 20th century, they were stressed out to the max, all the time, probably even worse than we were. And having to get memoranda and reports done as they take a midnight train from Baltimore to Boston or something like that. They were doing the same thing. And they were constantly under pressure to render decisions. So maybe that could ... maybe that's a constant. It seems we do much more though, or the productivity is much higher. Productivity is higher now than it was twenty years ago not to mention fifty or seventy years ago. It just doesn't take that long to do stuff anymore. And that's all technology driven.

Elise: How do you share your findings and lessons with the field?

Joe: Personally? Me? (*laughs*) I don't. You mean writings and things like that? **Yeah or speaking ...** No I don't typically do that. Some people have an interest in it and an attitude for it. I ... Over the years, long ago, I used to do visiting lectures and things like that at universities. But I haven't done that too much anymore. And from time to time I've written some things. There was a ... you know the APPA? I've written some things. They have a book

they call “The Body of Knowledge” and I’ve written some site planning and campus planning things for them.

Elise: Do you think Sasaki has a culture for sharing with the field? Or are they ... Are you more internally based where knowledge is proprietary to the firm?

Joe: Right. I think that ... Yeah. We’re probably not that good at that. As I think about it you know? There was a time when we probably did it more. But I would guess that ... you know and that was ... Hideo was sort of a ... he was a prominent figure and he didn’t relish doing that kind of stuff at all. He never wrote. I think there’s only one or two things that he ever writ ... or wrote for professional journals. And I know he always would try to avoid the lecture series kind of thing. And he would just delegate it to, you know, all his senior associates and junior partners and so forth (*laughs*). So it wasn’t something he relished but he did enough of it to be ... you know, get around. He encouraged it in his younger partners. And there were some who were excellent at it, some who have spent their entire careers gaining visibility and doing those things you’re saying. But maybe as a ... And so the ... But those are probably the exceptions I think in the firm. I think the planners have probably done a better job of that than the landscape architects or the architects. He ... But there are some people who are currently very interested in doing that and it’s becoming more ... or becoming more connected than I think we were in the last fifteen, twenty years.

It’s ... I guess you have to have a culture that supports it, which we’ve always had. But you also have to have personalities that *want* to do that kind of thing.

Elise: So Hideo retired in ‘84?

Joe: I think ... Well he retired I think and left the firm in like ‘81 or 2 and then he maintained a relationship for ten years. He moved to California but he had a consulting relationship with the firm and he worked on projects from time to time.

Elise: Okay. But you were here when he was still around?

Joe: Yeah. Right.

Elise: So how did he personally, kind of, move this evidence-based design initiative forward.

Joe: Mmm I don’t know (*laughs*). I saw him at a time in his career when, you could say he was in the winding down phase. I mean he would do individual projects but the firm was sort of running ... I mean he was still at the helm and he was still running things but it was running without him, you know when I ... Hideo was about ... a pragmatist. I mean he was a lot of things. But he was maybe, when it came to practice of landscape architect, he was very pragmatic. And if a piece of information or a methodology was available and made sense, he would be the first one to jump, and you know, and employ it. If it were theoretical and if it were on the border and we weren’t quite sure how we were going to use it or not, we would just say, “forget about that!” So ... He was looking to solve problems most of the time. And that’s why I would ... said in the beginning when we worked with Doug Way in the McHargian sort of large-scale land analysis method, that was a ... sort of direct application, that wasn’t experimenting with research. It was using something that was there to solve a

problem and solve a client's needs.

Elise: So where do you go from here to continue the Sasaki Strategies or evidence-based design in the firm and in the field perhaps? (Joe pauses to think) Where do you think?

Joe: Where do I think?

Elise: Where do you think the firm should go?

Joe: I don't know, it ... Well I think we should keep doing what we're doing. There is a ... There's an added richness to the planning process when you sort of bring technological means of sorting, identifying data. There's a great advantage to planning that didn't exist without that. And I can't imagine that the applications or the types of problems or the questions are going to dry up. We haven't sort of the: oh we did Sasaki Strategies five or six years and we've sort of reached a plateau – I don't think that's going to happen. I think there will always be additional things and problems to solve. Maybe there's been sort of a literal rush at the beginning of ... as we've gotten into this of ... But I think there will be as many ... For example I see, over the ... Before we had the tool My Campus, I mean we sort of relied on more anecdotal methods for gathering information. But now that we have My Campus, you can assemble ... you're familiar with that stuff correct? You can gather huge amounts of information. Now when we first started that, it was used occasionally. Now it's used all the time, for lots of different things. And people find applications for it. So you could say we've sort of reached a plateau with that, but there'll be something else that we'll reach a plateau with *that*. And keep finding ways of applying these technologies. And it depends on the kinds of problems people ask you to solve, what you come up with.

Elise: Is there something that you would like to see from the field or academia or incoming professionals that would you help you move forward, help the firm move forward?

Joe: I can't think of anything specific that ... like the burning, you know, need or something that's really dramatically missing. I think what the firm needs, what it always has needed in the past, and that is people who come in with a ... you know, a well-rounded education, have a general understanding of all the aspects of landscape architecture, understand design process. And that's a platform that you start from. And then, who knows what's going to prepare somebody for the profession twenty years from now. They're going to have to find that out in their own career path. But I think there's still a, you know, a need for a basic grounding in their profession. Certainly the thing that has changed in the past that is now a prerequisite is, you know, understanding and having computer skills to practice at all. And it's just a necessity. And so those people who are coming into the office who have excelled in those skills, will find a place very, you know, readily, because those are the people that are needed and that's the job they will have. No one's going to take them on their first day and put them in charge of a project or give them all kind of responsibilities that are beyond their capability. What they're going to do is the things that they're capable of, which is producing products and drawings and sorting spreadsheets and doing all that computer stuff. So I think people, you know, need to prepare themselves that way.

I always see that as people grow in the firm ... Let's suppose someone came in ten years ago, computer savvy, very good, proud of their skills, very happy to just crank away on AutoCAD all day, and satisfied with that.

But then they start to take on other responsibilities that take them away from that, sort of, drawing exercises, they lose those skills because you're not doing it every day. And they're now wrestling with ... they're in this sort of limbo land where all the younger people are faster than they are, the younger people know how to produce things faster than they do. So they either, are sort of being forced to take on tasks and thinking, and management activities that are no longer that sort of entry-level production capability. And I just ... It's unique to watch that sort of transition, it's the first time I've seen that happen.

Elise: Just because they move so fast (*laughs*) and new technology?

Joe: Yeah, things are moving fast. And so what it ... Maybe another interesting question for you is like, what does it take to come into a firm these days? You know, what are we looking for in terms of people coming in? What does it take for someone to mature in a sort of technology-facilitated environment? What do you have to keep up with and what can you drop? And if you drop something, what do you pick up in terms of skills?

Elise: What do you think it takes to mature to that ...?

Joe: I don't know, I don't know. That's an interesting question (*laughs*). Being a ... I mean, I grew up in the profession before technology, so I never learned AutoCAD. There was *maybe* ... I think that maybe there ... There was probably never a window where I could have done that. I had already advanced to the point where I was not going to sit and draw construction documents. I think we first started using AutoCAD for construction documents in 1987. And we had two AutoCAD stations. Otherwise everything that we... came out of here was drawn by hand. And that was the same everywhere. So by that time in my career, I was not at a point where I was going to sit and learn AutoCAD and continue to do construction documents. So I never learned that. There's pressure I think for ... Well there's probably a couple different paths. Suppose someone comes in with great AutoCAD skills or great computer skills and they want to move up but they don't have either the skills or the capability within our organization to move. We have people who stay here (*gestures to the lower part of a hand diagram*) and they're quite happy doing that. They're sort of technology-oriented people who just say, "okay, I'm going to be a great CAD draftsman and that's sort of my career path." But for someone who wants to be a landscape architect and move up and take more responsibility for decision-making, they have to wrestle with this question of maintaining their ability or capability with technology. Like I don't know what [Greg] Janks does with technology anymore, I know that he's got a lot of people around him who do it and he understand what they're doing, but I don't think he does it himself.

End

Interview conducted by Elise Fagan

Date: July 25, 2013

Location: OLIN office; Philadelphia, PA

Duration: 0:46:00

Karl: *(Karl sits at his computer and is already discussing some of the evidence gathering initiatives at the office.)*
... him and Michael Miller, who is from the design staff, he is kind of the principal investigator on the really full throttle post-occupancy evaluation we're doing right now down at Canal Park in Washington D.C. That was a project we've been working on since 2009 that just opened in 2012. Since the spring, he and I have been going down there to do surveys, record observations, do time lapse photography partially to fulfill some Sustainable Sites Initiative credits. They have a credit that's specifically for performance monitoring. I'm not sure if it's ... if it's going to ... how it's going to continue because this was a pilot project. So we're definitely getting a little bit more leeway with going back and proving things that the pre-design ... in the pre-design metrics. But partially it's for that and we figure in the process we can do ... kind of build a methodology for ourselves to do long term monitoring. Because that's ... he and Skip definitely ... I think that's a high priority of theirs is using that data to kind of inform future design. It's such a ... it's such a like a Rosetta Stone for urban projects; it's got a little bit of everything. So we're focusing like most of our efforts in fact on social credits that we were going after with SITES. Things like creating spaces for mental restoration and for social interaction because those seem like the ones that are really kind of more fuzzy. The methodology towards proving it at least through SITES is still a little less rigorous, less quantitative. Whereas with the ecology restoration the kind of economic factors, we feel like we've got it pretty good handle on that. So people are ... it seems like people are starting to come around to stuff like Jan Gehl and they're revisiting Holly Whyte. But we're hoping that in this process we can get some scientific proof for things in the field like they already know or think they know and maybe find some less intuitive things as well. So I'm really ... really got to get back on that actually (laughs), we're going back down in August in three days.

Elise: And where is this? I'm Sorry.

Karl: That's Canal Park. It's a three block long linear park. This is no good for your audio but it's that one right there on the wall.

Elise: Oh okay.

Karl: In southeast Washington D.C. right by Yards Park and the Nationals' new stadium. It's ... it was kind of like a developer led project that was part of the Anacostia Waterfront Navy Yard sort of master plan that came a couple years earlier. So they were ... they were eager to get that one up and running and kind of specifically to be a symbol of sustainability to get that identity to this new neighborhood they were hoping to develop. So we're going to track how successful we were at that and how specifically like design decisions contributed to that success. It's interesting (laughs). And hopefully like becomes a sort of built-in service that we can do, this sort of long term monitoring if we get it ... if we get a kit of parts in place that help us do it.

Elise: What do you think is required for the firm to be able to do long term monitoring?

Karl: Not a whole heck of a lot. Conceptually I mean we would need you know the hardware to actually document how the place looks and performs over ... depending on the size of the park and the client for long

term. So we're talking about either a live-feed camera or a time lapse over a long period of establishment and seasonal variation plus either boots on the ground to talk to the uses and record observations or some kind of partnership with the academic or local community to do the same. I think with the right ... if you're asking the right questions you can, you can do it relatively easily. That is if you scale your study to the place and you're not kind of working through the methodology each time you do it. I don't think it would be to terribly onerous. You wouldn't have to train a future generation of landscape architects to do social science research, just one or two would know it really well. Does that answer your question?

Elise: Yeah well what about ... I mean you'd need funding to do that kind of thing, right? Are clients looking for long term evaluations?

Karl: Well that's ... that's more of a question for Skip. I'm ... my feeling is that, yes there's a market for it, but you know I'm the librarian (laughs), I would say that. Yeah I think if we start from a position of clients having an interest in you know longer term performance metrics for their projects which, you know we'd have to assume from things like Sustainable SITES and the LAF case studies and all those things that clients are invested in. Yeah I think if you can hire the landscape architect up front to build that into their scope of services, it'd be great. Then you know, if you're working for a public client for instance you know a state or a city, Department of Parks and Rec., Department of Transit, things of that nature; these are jobs that they don't have to do themselves, they can hire us to do and they can hire us to do pre-design. That's my personal feeling about it. It's not always necessarily ... I'll leave speaking for OLIN to Skip but yeah that's what I'm thinking about as we go through it.

So just to illustrate what might have been a little bit fuzzy about the Knowledge Base. (starts clicking through the site) So this is what it looks like. The inspiration was probably somewhere in-between Google or Bing and just what you see on your smart phone. So there's a heavy influence on you know just across the board site search for whatever you might need but there are some built-in sort of widgets that lead you to areas that are focused on specific topics or specific types of media. But everything again is based on the structure of the key page so any one of these pages ... this is kind of like our employee handbook, here's an expense account ... can be jumped into at any time by anyone to edit and update. Get a history of those revisions. You can attach files which can either be PDFs, Word docs, CAD files, Illustrator files and a lot of the time, turn out to be photos, which are excellent precedents.

Elise: So let's see you have: practice, projects, library, plant finder, sample room ...

Karl: There's a digital version of this ...

Elise: OTV?

Karl: Mmhmm the TV station. Research is kind of a catch all for all of the things that we go to the library library for but born digital. And professional practice are things like our Master Specs, contract documents, how to do tree tagging and you know stuff you know in construction administration. You know real, how to be landscape architects type of things. There's a lot ... there's an increasing emphasis on like an education series that we have here. There are different groups that have kind of popped up and said you know we can get the studio together at lunch time you know every couple of weeks or every month and talk about topics specific to:

there's one on living systems, there's one on, they call it building right, which is all about you know thinking in terms of construction when you design. There's one specific one that's all about you know the tree installation process from like design to the nursery visit, tagging, watching the installation, and writing up reports, that sort of thing. And this is a good way to explain ...

Elise: And that's all done by people in house?

Karl: In house, yeah. So like here for instance there's this ... one of our partners, Steve Benz is a civil engineer by trade and spent a long time on the USGBC board I think in Massachusetts when he was at Sasaki. He ... When he started here in 2011, initiated this series; it's kind of like a lecture series getting together every couple of weeks over lunch. Where he would kind of summarize first the major issues and vocabulary around grey infrastructure and moving into green infrastructure, just so that we're speaking the same language as you know the engineers and architects and the other contractors and consultants on our projects. So and ... so that everyone in the studio has the same kind of base level of knowledge. Because it was, you know it was kind of his new bailiwick this department of green infrastructure. So the form that that took were these (sometimes more formal than others) lunches that were really just videotaped (laughs). But they can be caught up on at anytime for someone who you know wants to revisit a topic or like maybe joined the studio six months ago and didn't get to see number 201 on soil science. And they attracted, you know everyone down from the interns up to the most senior partners and owners of the firm. Those are really fun. What I'm even more excited about kind of for the future ... and these are some of those other series that I was talking about. But what I'm hopeful will really take off as we get more younger designers or more tech-savvy designers in the studio are these much quicker light weight sort of: let me demonstrate how to do this in CAD or let me show you what this software can do – five minute tutorials that someone can screen capture at their desktop, record a little narration and put it back on one of these pages. So that's kind of a pet interest of mine. The more traditional stuff we include is something like the library catalog which operates just like a public or university library, you can search everything that's been added to the collection, that's been pretty extensively cataloged because my background is in academic libraries. So as soon as I was kind of able to get up to speed on the industry, everything was able to be cataloged to their needs. It's a totally proprietary shelving and cataloging scheme; it's not Library of Congress or Dewey or anything like that because it wouldn't really ... it wouldn't really go very far, you'd have landscape architecture essentially. So I kind of let them dictate those terms to me and that's kind of ... that's in a way a larger influence on much basic general ... it's very tailored to OLIN. Even as we look for ways to kind of cinch it up. And the archives, these kind of window into the archives catalog. It's a little bit more stripped down; you can search it by project name or number and it will tell you what's down stairs in the secure archives location on the shelf in terms of pre-CAD drawings because we have twenty-five, thirty years of those and we do still save a whole lot of drawings on paper. Mostly my emphasis is on preserving the base completion of sets and anything that's done you know for presentations or on trace because you can ... you can preserve those things digitally. But as our marketing department learned with all of our Quark files: formats change, media changes, and sometimes it's worthwhile just to have the stuff, you know in a physical format to pick up off the self.

So the way that most of the design staff though experience this is probably through these first two things on the left here: practice and projects. And so practice is kind of like grassroots employee handbook. It wasn't actually part of the Knowledge Base as we first sort of handed it off to the studio in 2011. But pretty immediately, there was agreement among a couple of design teams that you know, they can provide a lot of answers really quickly

to some questions that people were asking every day. And you know it wouldn't have to take the form of a, you know a bound handbook that everyone was handed when they walked in the door and kind of seemed like a little bit too prescriptive and limiting. This was something that was, could be changed at any time by anyone and was just there to kind of make your life a little bit easier rather than police how you can ... how you act in the studio. So you know, one project team of ... one of our larger project teams had a light day and the associate on the project said to them, "okay I want you to answer these twelve questions on a page like this and we'll get it up and running." And it turned into this. So it's everything from like how does the phone system work here, to you know, what are the standards for title blocks on all of our drawings? You should talk to them about X, Y, and Z. The actual design work is more on these project pages because the projects are ultimately like what spurs all of these questions and sort of the hubs where all of the different topics overlap. So you know they're just organized chronologically; every project has its own number by year and when it came into the office and let's take ...

Elise: Now are these completed projects, is this, does this act like the server that all of the documents get put into?

Karl: (*agrees hesitantly*) Yeah. This is not every project that has come through the office yet because getting all of that historical information is still you know a work in progress. We still have to do a couple oral histories or something. But it's everything from the 1970's up through the one that just most recently got in the door. Those ones, those most recent ones will have a little bit less information but it builds up over time. I can give you a very recent one that's already ... So this is one of those ones that I wanted to track very closely ... as we go with it. Now I mentioned that we pulled a lot of information from other sources and kind of like skim it and represent it here so people don't have to look in five different places for that. (Referring to different pages he's pulling up on the screen): The sort of basic typology information about the client, the size, and scope of the work. Here the team, the internal team working on the project, the external team, consultants on the project. Eventually works down at our archives. These all are maintained in different databases with different softwares but if someone just really needed to know right away, "wait a minute I need to know a little bit about Alexandria who's working on that." They can jump in here and find out right away, at the same time they can get an idea of what the size and scope of that project was and who the consultant team was. So there's no kind of editing front and you know inputting information through here but you can glean it really quickly if you need up to speed. Does that make sense?

Aside from that, as I was saying these are kind of hubs for topics that are common to other projects. So under, you know a researcher or precedents heading you might find links to other places or ideas, reports, areas for further research that could be specific to this one project or common to three or four or just a perennial issue. So this is a slightly older project, you have a little bit of marketing information that's standard information. Historical documents that someone might want to catch up on if they're walking into a meeting. This I should mention is totally available to everyone through their mobile devices, tablets, outside of the studio, if they log in they can see exactly what we're seeing here and just kind of have everything at the ready. Where's our ...

Elise: So these don't house the CAD documents of the actual design itself?

Karl: No. At least not always. What I'm doing is I'm adding the kind of record sets typically as you know PDFs to those projects when they're added. You know, we have an internal couple of servers that act as our network

and it's structured in much the same way you'd find ... (Moves to different location on the server) This is where all of the CAD files are. Now if I were to move everything up here that would be great because it would be totally searchable but it would be a ... it would require a few more servers than we have running now.

Elise: And are these tagged with certain key words that if you typed in green roof or something ...

Karl: Some of them are.

Elise: ... a lot of projects that included green roof would come up?

Karl: Less the projects so far. That's a good thing to do more ... more often. A lot of times we turn to the vision data, visions are part of the project management database. The vision data that's put in by the associates to kind of generate these lists right away of projects that fit a certain typology but you know ... (types in "green roofs" to search bar) So our main entry on green roofs does have a list of more curated projects based on, you know, what they can teach us something specific about green roofs or they're important precedents for us to cite. I wouldn't venture to guess a number but a huge amount of our work is over-structured. So at some point you have to kind of stop (laughs) and say like this is enough for you to handle right now because a total glut of information I think would scare people off, might be too much. One of the reasons that I was really turned on by this idea is that you know it's a search engine and kind of an encyclopedia without the problems of Google and Wikipedia which are too much information and information you can't trust. So you know for instance when you're searching for green roofs in this repository instead of on Google, you're going to find stuff that was, that spoke to us, either our own work or from projects outside of the office, the books that we know are authoritative on the subjects. You're not getting you know stuff by authors you never heard of, anonymous authors, things that really are just perpetuating myths. It seems to have been a lot of problems lately research that has actually influenced our thinking about it. So that's kind of why it takes a librarian I guess and why it can be a lot of fun.

When you say research that influences, you're looking at literature?

Karl: So I mean on green roofs for instance you know we've got ... this is an open source location ... (starts scrolling through) ecological engineering, bioscience but it needn't always be you know the grey beards. (types in 'carbon storage') Need to look at carbon storage because that's an example of something that had ... we've gotten a lot of ... there's a lot of academic research out there. These are of course those ... this is a collection of, kind of turns into an additional library for us. So like Daniel Nowak for instance is you know one of our most trusted voices on carbon storage and sequestration and kind of reduction of particulate matter and air quality assessments and that sort of thing. He's top notch but at the same time we take in, you know stuff from the news or at the Atlantic cities at least that could a little more quickly catch people up to speed and let them know about, you know, what people are talking about. So it's available in that sense there's some very wonky material in here and some less of..

So like we could have air quality for instance talking about Nowak ... (types something else into the search bar) there ... We've got a couple of other pages to date that way. Very kind of heavy stuff and in the meantime that ... we could put that next to ... that could be, rather that could be referenced on the same project as ... let's look at (*started typing*): plug and play system of hedge planting. Real simple quick explanation and a couple

of illustrations. That approach to kind of connecting the topics back to the projects is something that we're working on doing a little bit more formally with the actual stuff of the sites, the materials, thinking of project sites in terms of a kit of parts. Can we even call it that ...?

This is a project for which we actually kind of delivered the client sort of a le-carte menu that they could look through at the DD phase before we went into really locking things down and it let us be able to create a custom materials list which again could be, you know, a very quick introduction to a general topic: okay this is a one sentence description of pervious asphalt and this is the project we used it on, the spec that we wrote. But it can get very ... it can get very much into the weeds at the same time. So a Black Locust was tearing up the field a couple years ago; everybody was like thinking: was it the perfect answer to tropical hardwoods, did we finally find a way to crack this nut? And amidst all the conversation that was happening in the studio and around the professional myriad, we kind of summarized it all here from like the material properties of the wood, to where we're going to use it ourselves, who's supplies it, what its ... a description of how it weathers and whether or not it's considered sustainable for LEED or FSC [Forest Stewardship Council] purposes.

This is kind of like, where I'd like to get where everything that you see on the shelf behind us. It's a heavy lift but all of this information really already exists. This is research that is already done by one or more projects around the office and if we can move more of it on here it just ensures that we're not starting at zero every time we want to know this stuff. Because you know, we're at the point now at eighty employees where, you know, you really can have one project that has no exposure whatsoever to another; designers who have really no conception of when they come in day to day what a person five seats down is working and it might be the exact same thing.

So let's see if I can get into this it just reminds me of something. We had two projects that we're looking at, wood alternatives for a bench application and they wanted to, you know be able to compare everything that they were considering using, you know with the tropical hardwood standards with the synthetic stuff like Trex and you know the domestic options like Black Locust and on the same scale. So we're ... so it's just an experiment that we did with something called Fusion Tables. It's a Google product that's kind of like Excel on steroids that let us kind of compare apples to apples and different material properties and sustainability issues to be aware of long term values and right side by side with what it actually looks like. I'm really, really bullish on this tool and Google developing it further because it's ... it gives us some great kind of out of the box visualization tools some of which ... allows us to map ... It creates custom Google maps for some of these things which when it comes to stone that's coming out of ground, is a real favorite topic of mine. So that was a bit of a rant (laughs). Let's see ... So there are other less developed materials or assemblies then say the Black Locust entry but they're growing. The whole thing right now has about fifty-five hundred, yeah fifty-five hundred entries which in less than two years is not bad.

Elise: It's huge

Karl: Yeah (laughs). I'm happy with that. A lot of them again are short but they're always growing. So like today for instance, what did we get ... a new project, okay. We had an introduction to some Civil 3D tools that were added to those video collections. And a Webinar by Jim Urban that went in there as well. Josh just added something on Corten I guess, some material properties. So you can kind of keep up with the buzz, there you can see it's mostly ...

Elise: So what's the difference between the research portion and the library?

Karl: Well the library is literally, you know a catalog to the books on the shelf. So if I look for green roofs here (types in 'green roofs'), it would tell me okay these are the books that touch on that topic, there are twenty of them in here like the card catalog you use, where to find them. Whereas at the page that's under research, you know there's a quick jump to those catalog entries but you also have the projects, related topics, or more specific topics like we did just a breakdown of the modular green roof systems, what they cost, and what they do.

Elise: So this is all in the research portion?

Karl: Exactly, right. Research is a little bit more open ended. It's kind of organized under similar major headings as the library is. They're all here (*refers to screen*). So climate construction issues, plants and planting is obviously one of the major sections. But for instance I know we don't have any books on antidesiccants (*laughs*); that's something we just had to create for ourselves and it comes from plenty of research which doesn't have a place on the shelf but certainly does digitally. I'm nervous about these links out to external sites but so far they're not so bad. And it's a good ... it's a good place too, like I said, for precedents because those only kind of get printed and bound and added to our library in big huge chunks. Whereas you know if someone wants to very quickly share a project that they were interested in with the group and it's not on LandEasy or something like, that this is the place that they can go. It could be as simple as that or there's some very kind of complicated ones.

Elise: And do you monitor the entries?

Karl: Yeah.

Elise: ...if somebody updates them?

Karl: I try to encourage people to get material up and then you know I'll take on the role of an editor making sure you know it fits the non-existent style guide, gets tagged so it's a little bit easier to search, and it gets shelved in the right area in here so it's available for browsing or if people are on a related page they get to see it. I try to make the barrier to entry as low as possible so that people feel like it's, you know it's easy to just added something. If it doesn't look perfect or you know totally comprehensive it's great to have me be able to say, "oh you know what, that other project was looking into this a couple weeks ago too, let me see if they had anything to add." So yeah it's ... I've been kind of easing off the gas when it comes to actually authoring content which I was doing a lot at the beginning, and letting them take over that process and just coaching them through and editing what they add. And it's ... to some degree it's a question of you know, how digital native some of the designers are; it's a generational thing but not completely. I mean the person who's really like most adamant about, you know having the material on here so you can access it you know from his iPad in meetings all the time is forty years older than the next most frequent contributor. It's just ...

Elise: And who is that?

Karl: (*laughs*) Oh no he might be embarrassed. Richard. I'm sorry Richard if I miss judged your age (*laughs*). He was a partner and leads a lot of projects that deal with historical preservation and community engagement so he actually meets with a lot of local community groups on a regular basis especially on projects down in Baltimore and up in New Haven, Connecticut and Syracuse, New York. He's very kind of like wired which is awesome.

And Dennis McGlade who has been with the firm from, you know right after its founding, is someone who doesn't you know necessarily access this on a daily basis. He's still very much more traditional in his approach but he's always emailing me, you know conference notes and things like that saying, "oh for the Knowledge Base." Which I'm totally happy to assist with (*laughs*). My hope is that someday we're going to you know seclude him and Laurie in a room and say "start typing." (*laughs*) Just ...

Elise: Get it all down.

Karl: "... tell us everything you know." In the meantime, you kind of have to work with them to get it in there. So that's where this idea of having, you know, a fixed process of meeting, you know, for the sake of this repository. Let's sit down and talk for you know thirty minutes about this problem you were facing on three different projects; did you find the perfect solution? So in the case of the two projects that informed that wood matrix, you know, what did they ultimately decide? Which were, you know, the factors that were determinate for them? So we can kind of learn a best practice from the process or at least, you know, influence. Not kind of get totally prescriptive with it but kind of have the case study. That's the goal. Does it make a little bit more sense?

Elise: Yeah.

Karl: Good.

Elise: And what would you say the percentage of the office is adamantly contributing to the Knowledge Base?

Karl: Well and it depends on the ... it's hard to put a label on it because you know someone like me can contribute a little bit every day of the week and you know someone else might contribute once a month. But if it's the right ... if it's the thing at the right time, it's not really comparable in terms of volume.

Elise: Do you feel like you have to push? Is it still hard to ... I'm sure it was two years ago to get people to ...

Karl: Yeah because ...

Elise: ... add to the Knowledge Base?

Karl: Right, because it's kind of a ... it's kind of an intrusion, you know, on a process people have been sort of getting used to. So the thing that I can say about it being generational but also not generational, is that more than it being determined by how old you are it's more often determined by how long you've been in this studio. So people who joined six months ago for instance are ... I would say tend to be more regular contributors than those who have been here for ten years. Not as a rule but you know, they kind of dive in faster because they understand like everyone does, kind of the ultimate promise of it but they haven't been sort of trained into a workflow process of which this was not a part. It is ... to kind of add this in, it seems like an extra step at first but really, we've tried to make it as much a tool to, you know, replace others in the process. So it's been a decreasing amount of push on my side from the beginning, pretty steadily down to the point that, you know, I don't ... I used to send around, you know, regular spammy newsletters about: "hey, this is ... all the great ... Let me show you ..." (*starts typing*). Yeah, let's take number three ... here's ... we had a great session on meadows

and here's an update on everything we've got on playgrounds and new technologies, maintenance plans. Like eventually people got it (laughs) that they ... that this was the type of information that they could get out of it. One of the reasons it took a long time to develop was that we knew when we launched it, it had to make an impact right away. People had to know that you know they could rely on it. Before they said "well you know if I contribute something every day for the next year it will eventually become useful." And it had to be pretty good out of the gate. And from there, they've really taken it on. So I'm ... again like I said I'm not offering nearly as much as I used to. And yeah hopefully it becomes kind of theirs, it will be hard to let go of it (*laughs*). It's ... it really is theirs and if I could just, you know, figure out the ways to shape it in such that it's, you know, it's speaking their language, that's great.

Elise: In an ideal setting how would you want to see the Knowledge Base used throughout the design process?

Karl: Hmm ... Well I guess ...

Elise: Where does it start to come into play, where is it the hardest?

Karl: For me it's ... I think it's most useful when someone is working in CAD or working at the drawing table and says, "oh shoot I don't know how to do X; let me flip to the Knowledge Base and go okay yeah, okay got it" do it and then add what they did as an illustration. So like the other day we had someone say, "hey you know, I've never created a bocce court before; has anyone else?" And they all said "oh yeah!" So we found out which projects, we got a great list of precedents, one description of, you know, what you kind of need to know about the sport to get started and some like very basic plans and sections that start you off on your way. That would be ideal if someone, you know, six weeks from now says, "shoot I don't know how to make a bocce court." They might not have even been around for that conversation; they can jump in here and find it and make something of their own and add it to the process and it keeps building. That is kind of like the utopia version of it for me. Now as ... thinking of it outside of like, you know, the medium itself, you know, a lot of the information that gets put in here can have a life outside of the Knowledge Base. You know if all that data we collected on the wood could be done for stone and we could feed that into a module in LandFX, great; then someone doesn't even have to move away from the program they're working with to pull up information. But for now I think it works best and is easiest for people to wrap their heads around as a standalone suite. And I think it has applicability to more professionals. I'd loved to do it someday for ASLA like a public version that you know, someone in a two-person firm can use or a student can use instead of just people who work here. But that's a long time off. I took it to ASLA when we launched it. I did a little presentation to the conference and it ... like the people who turned up and were most actively like interested in it were students because they really ... like their libraries back at school were not doing anything like this and it was much more pertinent to their needs than what they were getting. So if you don't go to UT Austin or Harvard and you don't have a MATLAB, like this is the kind of resource that could be there for you. So you know, that's bigger goals. Do you have any other questions before I tap Skip on the shoulder?

Elise: I think that's it.

End

Interview conducted by Elise Fagan

Date: July 25, 2013
Location: OLIN office; Philadelphia, PA
Duration: 1:54:30

Skip: The studio came about from Penn, you know, from Laurie and Bob working together. And every partner teaches, you know, in some degree or another; so interacting, you know, be it with students, with faculty, is a real core value of ours. There are some clients and projects that have certain confidentiality rules and so not trying to be overly elaborate but we have to honor that, so it's really ... And some of those are in research area and some of them are in just project work, so. We were just, I think mind-melding on making sure that we're doing the right thing. But it's like it's ... you know, in terms of like ... this is the type of stuff we love to do, is interact with, you know, the academic side of things. So it's very much part of our ethos.

(Elise gives introduction)

Elise: So to start off with, can one of you please describe OLIN's evidence-based design approach?

Chris: I had taken a little bit of a stab at it and I opened it with, I think ... As there are a few generations of partners, I think that definition may vary. I think that it's sort of ... The founding-era-level partner, a lot of that evidence is sort of intuitive in their process, so they couldn't necessarily articulate it. And at that time they're beyond some traditional methods of the generic site analysis and things like that. It was ... There was perhaps not an articulated evidence-based design process, it was sort of implied and embedded in the process. And then I think the next level generation just probably gets ... maybe where we sit ... I think there's been a much stronger desire to redefine what evidence-based design means to our practice and how we achieve it. And particularly in my role as director of technology, part of the challenge is filtering through all of the different ... you know there's a lot of different vehicles, mechanisms for harvesting evidence that could influence a design, right? So all of the stuff that was traditional McHargian analysis, you know, pedestrian noise, environmental, all that stuff. Like there's a million ways to get at all of that. But what else is there? What else is the ... what other pieces of information can start to influence? And so a lot of my time gets spent investigating that. But I think that perhaps (and this is my own opinion), I think that the next generation partner will really benefit the most. You know, I think OLIN as a whole has had a bit of an embedded yet not articulated evidence-based design process. And I think that the tier of partner that I'm in is very interested in articulating the evidence-based process. But I think that next generation of partners will have the benefit of not only ... well they'll have the benefit of all of the previous partners' experience and will be able to clearly say, "this ... these are the things that clearly informed our design process. And here's the qualitative aspect of them and here's how we proved them out and explored them." Which is kind of funny, I mean we've been a thirty-six year old firm, and we're coming back to probably some of the things that Laurie and Bob like sort of talked about very quickly. Laurie Hanna ... or Laurie Olin and Bob Hanna obviously the founders of the firm. You know very quickly ... you know from academia, everything starts with ...

Skip: Right

Chris: ...you know all of their ... you know all of their projects came out of addressing a problem statement.

Laurie's very fond of sort of cavalierly saying that the studio happened by accident. Like he and Bob came here to ... or he came here to teach. You know he ... they investigated some stuff, they set up a studio and then somebody was like, "hey you're thinking about some good problems, we have a problem here, can you help us?" And he needed some people to hire to help figure it out and the studio was born. That's probably (*chuckles*) a little simpler than it really was, right? You know ... And it was actually a very intense problem. And our first project was Johnson and Johnson Headquarters ... in New Brunswick, New Jersey I believe?

Skip: Somewhere in New Jersey

Chris: In New Jersey. And there was ... It was one of our first projects and one of the first commercial projects that addressed the issue of using meadows instead of lawn and that was substantiated with evidence. And the evidence was gathered by ecologists proving the value through maintenance records, environmental ... all of the things that are good about a meadow, instead of using a lawn. That was one of our first projects, I think it was one of the first in the country ...? I don't want to ... He's so cavalier in saying, "we did it first." But you know, there was that need to bring in specialized consultants to help prove, not only to the client, but also to the design process. Because ultimately like this has to make sense. You know, is this the right thing to do? And it ... The design notion of saying "a meadow" has a very beautiful aesthetic value, but let's really substantiate it with the environmental value that it's adding to the project. And that was done by bringing in consultants, which we still do. You know that's ... that's one aspect of how we sort of qualify our design decisions, is that we have ... we find the people who are the most skilled at what they do. And they help inform our process. Is that sort of in the ballpark?

Skip: Yeah absolutely.

Chris: I think that's where it started. You know and that ... And when I say that it was implied in our process, it's because it was I think ... you know in the early ... in the early years of our studio, those types of things, it's just what you did, right? It's like well why are we doing this? You know, starting with the "why" of why you're doing design and how you're going to substantiate that. I don't think we ever do anything just ... well I shouldn't say ... I'm going to stop myself for a second (*laughs*).

Skip: Well I think it was ... I think that's an interesting project because you know, from the very ... that was our first project in the office and you know, you would think that if you were starting a project for the first time, you would pick an easy project. But no, it seemed like because this was a request from Harry Cobb to help them do this project, because they had no idea what to do with the site, was that, you know, right from the get-go, our offices ... a lot of it is solving very complex problems. Like, we didn't start off this residential design firm that then became, you know ... But this is like serious like ecological restoration using the landscape for regulating of the building and all this type of stuff. Which is very complex right off the get-go. And I think that that's the way Laurie and Bob ... that's their approach is to kind of like solve ... you know, we're addressing a series of problems and challenges and trying to make it look beautiful – artistic, aesthetic response. But in order to solve a problem, you have to set it in a context and you have to do research and you have to understand it. And you have to understand it from all the different participants' points of view. Like you can't just take it from a designer's point of view, you have to understand the ecologist's point of view and the engineer's point of view. So this idea of setting work in context is a very academic thing. And that's why I mentioned the idea of the

academic berthing of our ... the academic background of our firm being very important.

Chris: Yeah, I ...

Skip: Because we always try and ... you know, we like to set our work in context both physically and also, I mean scholarly if you will. Like what has gone before? What didn't work? What can we do better? And I think that one of the things, my personal interest is encouraging a relationship and conversation between practitioners and academics and research. I think there is absolutely room for highly specialized practitioner research and highly theoretical academic research, and they don't necessarily have to overlap everywhere. There's a huge middle ground that we are giving up to others like architects and biologists and so forth, that we should be working together to capture and be comparable to the experts. And things like sustainability being one of them, where it would benefit from an academic partner who has more time to dive into detail. And a practitioner who has the range of contacts and experience to build something, to work together. So I think in terms of the evidence that, in order to facilitate that communication, you have to have that common ground. And scholarship and research is usually the common ground between those two points of view. And so I think we ... personally, I'd like to see that dialogue happen and find where there is benefit and where there is interest from both parties so that it kind of encourages that dialogue. So I think from the get-go solving complex problems, we had to do that. And we pretty much have had that mindset ever since. I mean we've never met a project that couldn't be less complicated (*chuckles*). It seems on all our projects they're saying ... I think you know ... Canal Park is a more recent one where you literally look at the Revit model and what's underneath it, it's just mind boggling. The coordination of geothermal wells and structural piers and stormwater reclamation and filtering and so forth. It's ... you know you ... No one is an expert on everything, and so you have to be able to be fast and learning from others and building others into ... And you know, the difference between a five-person firm and an eighty-five person firm is you need the tools to help distribute that information more effectively. And that's the Knowledge Base and some of these other systems that we've been talking about. You could get away with like having the one brain that everyone asks, you know basically they're a human Knowledge Base that's walking around when you have a five-person firm. But that doesn't work now. And the ability to edit the information and pull from different sources is what makes that Knowledge Base such a great tool to facilitate that application of evidence-based design, as you were defining it.

Elise: So you talked about consultants informing the design decisions. What other forms of evidence do you use? If there are any.

Skip: Well I think that in terms of ... I mean again, kind of back to your definition, I think there is always, you know, something as simple as the idea of a lit review of what is the context of what we're talking about. And then there is the physical research of the actual site. And then there is the more of the process and systems research of the things that are either functioning well and we want to enhance or they're not functioning at all. And then what ... you know, the team that assembles is assembled to address these challenges and it's really ... rather than plugging in these consultants at kind of separate, specific times; you involve them in more of a collaborative environment throughout. And that way, they bring their ... you know, you have a body of knowledge, they have a body of knowledge, and the two come together. You're able to not only work through the design but you're incorporating components that they feel are important or critical. And you're not ... kind of putting them at the end where at that point it's either too late, you know, when they need something it has to

change the design, so we put it in an ineloquent way or whatever. So it's you know, it's using them throughout the process to kind of build on. So it's you know, one person's not the expert.

Elise: Since that first Johnson and Johnson project, how would you say OLIN has primarily evolved in their approach since?

Chris: Hum ... that's a great question, and something we've actually, the both of us ...

Skip: Can we have the slide? *(both laugh)* It's just from this slideshow ...

Chris: *(continuing his sentence)* ... have benefited from. We ... As we had mentioned earlier, some of those concepts of evidence-based design, those intuitions were sort of built in in the early years. And as we ... you know, there ... and when it started it was you know, eight people right? So ... it was two people sort of setting the design vision, deciding what projects we were going after, the approach we were going to take, what was important and what wasn't. But there was always ... in their implications and implied design decisions, there was always these tenants of education and ecology ... and really technology. Not necessarily the digital form, you know ... the technological aspects and complexities of systems working together, as Skip had mentioned. Because a solution ... all of our solutions, as with any landscape architect, are dealing with multiple systems, whether they be ecological or social. And all of the pieces, you know, there are a lot of moving parts. So as the firm grew, the way in which those tenants were communicated and explored started to require a different framework. They needed, as Skip mentioned, you know with our consultants, they needed some of that specialized attention.

So out of that, the Directorship was born. The directors being myself, the director of technologies; Skip, the director of research; and also Steve Benz, our director of green infrastructure. It just so happens that all three of us are partners, but when we started, when ... as the directors we were not. So I mean there ... The only reason I say that is that there ... Just because they're on the same line on the business card, they're actually different roles that sometimes overlap. But they require some specialties. So ... There's ... there's the ... the responsibility now of each of those directors to help focus what's important and what isn't; what areas of evidence continue to be relevant to our design process. How much emphasis do we want to put on evidence-based design? And I think that's ... I think in-and-of-itself that's a little bit of an interesting question; you know the relevance. To what extreme are you using evidence-based design to influence your process? Or how much? And I think the answer to that question would also probably vary ... I would hope it varies a little bit, you know, in your research. And I don't want to speak for my other partners, but I tend to be one that has a strong interest in that right now, perhaps because it's my job, right? It's part of my job. And ... the mechanisms by which we gather that evidence are pretty robust, right? We have tons of data sets available to us, to tell us loads of stuff about a project. Some of them are just variations on a theme of historical evidence-base, like environmental factors, slope analysis. You know, whatever McHargian analysis as we were trained in undergrad and graduate schools you know ... That stuff everybody has, and there's a million ways to represent it or harvest the information.

I think what's interesting now in the evolution, not only of our firm but of the discipline and how we service the general public in the civic realm, is that one of the purposes of what we do is, one of our partners used to say ... coined the term "socially purposeful", we want to make a place that's socially purposeful. Well okay, how does

that happen? Again, going back to Laurie and Bob, in the founding years, those things were intuitive. There's a lot of by the stroke of a pen on a paper, you intuit what that space is going to create, that social purposefulness. Well now, some of us are involved in sort of breaking that ... re-breaking that down. Deconstructing that. What's making that purposeful? Fifteen years ago it was providing intersections of how people move and opportunities for people to socially interact, which you could measure based on proximity. So if Skip and I are sitting in Bryant Park and there's wonderful movable chairs that allow us to move it a little bit and create a place our own. I can measure the success of that based on how close we are and use that as a reasonable measure of a social metric. That we're ... we have the potential to have an interaction. And if we have an interaction then we can extrapolate from that that maybe I'm a plumber and he's a doctor and somehow we figure out the cure to something. It's pretty cool right? It's a little esoteric but it's kind of fun. The problem now though ... and this is an area again, I'm being a little selfish ... that evidence is no longer relevant. And it's because of that and this (*picks up his cell phone*). And it means that we can be sitting like cheek to cheek, back to back, less than two feet from each other, and never acknowledge the other person. Because of the propensity of digital devices. So evidence that was relevant fifteen years ago, pre digital age, in this particular case, is no longer relevant. So how do you evolve your evidence-based design concepts to now include and evolve those new metrics. Well first you have to define those new metrics. So how do you then ... if previously it was proximity for potential interaction, well that's not as relevant in my process. (*Skip nods in agreement*). Even though you said you weren't really ... you know, you were thinking more along the scholarly lines, you not just pedestrian modeling and people moving through a space. I truly believe those are the types of questions that landscape architects need to be focusing on. How are ... And constantly thinking about. How are cultural changes that are happening in the world, how people are interacting, effecting your design decisions?

One of the things that we're also aware of, as any place is, beyond some of those site analysis things, or in conjunction, is awareness of culture. Right? How ... What level of evidence is the culture of the place playing in your design process? Quite frankly, almost everything. That's it, I mean ... But how do you measure that? How do you ... how do you ... if you were to make a checklist of evidence, of that cultural evidence, and that was the category you were talking about, you know, what do you have to take into consideration? I think it's _____. But I think it's ... from my perspective, I don't know that we have ... I think we still, much like ... as much as we're exploring these things, I think we still have that sort of unarticulated, implied evidence-based design, that I ... You know, what's evidence to us? Oh, well every project we have to do X, Y, Z. And we have to gather it this way and it needs to be harvested like this ... I don't know that we would ever do that. I think we let the project tell us. You know, we like to say that the bones of the project are there. I mean that's not ... You know, it's what can we go off of. What requires an intervention that will benefit this site and the surrounding community and the region?

Skip: Well and there are so many variables to this too. Because I think that ... you know ... information analysis: it's a tool like any other tool that you have to know when to use it and how to use it and so forth. Like you know, when CAD first came out, people took a long time to really understand what was the most efficient use of it. And so you know, of course a lot of times it's like with students coming out of school sometimes it's like, "I know how to do this, and I'm going to use that tool every time." Well you know, if you hand drew that, you could probably do that in half the time and we don't really need that level of detail. So information analysis, research, it's really understanding ... you know thinking about critically how to use it and what is the outcome. Because you know, in our projects we always start with a, you know, a direction, you know: goals, metrics,

whatever it might be. Client aspirations, design aspirations, and so forth. The unique thing about our profession is that there's so many variables that lead to the final state that may not even appear until halfway through the project. "Oh the owner just ran out of money, now I have to redesign the project in an artful, beautiful way, you know encapsulating all these savings. But my original plan is out the window. And so all that research that was going to go to that, now what am I doing about it?" So it's really not only being able to reach out to the larger bits of information, but it's constantly reassessing the role that information in the project to respond to all the factors that we typically respond to. And I mean the client losing money is one dramatic example, but there are many times where soil conditions are not what we thought it was. Infrastructure can only be accomplished in a certain way. The community doesn't like, you know, which they thought they did. You know, one group does and one group doesn't. So you know, all these things that we rely on to provide the basis of what we're doing, it's not a one and done. I mean it's always evolving. And so the tools, again, that help us do this more quickly and reach out into the larger kind of landscape of information, are really important. And I think the ... I'm just trying to think of ... trying to say ... building on what Chris was saying is, you know the ideas of green infrastructure, technology, and research; these reflect kind of the original, as you were saying: education, ecology, and technology. And technology meaning everything from how do things work, how do you build things, to how you represent them. You know, representation, you know, is you know ... InDesign now, it was fountain pen and watercolor before. So it's understanding those tools. But it's ... yeah, it's always evolving. And you can literally drown in data, I mean it's really, it requires an enormous amount of critical thinking to understand what is the essential information.

Elise: So how do you keep track of that data, beyond the Knowledge Base, but making sure that the right data is informing certain goals in the decision-making process and following through on that?

Chris: I think that's a ... in our case that's ... we don't have ... Sorry I'm choosing my words, I just want to be careful ...

Skip: Well maybe I can dive in for one thing ... *(Chris starts to talk again)* Go ahead.

Chris: Well I'll be just very succinct. Quick rather, probably not succinct. The beauty of having at this point and in this firm's evolution of thirteen partners ... *(aside to Skip)* Is that how many we have?

Skip: I think so.

Chris: Something like that.

Skip: I should probably do research on that *(both laugh)*.

Chris: Right. It's that variety of approaches, alright? And we depend on each other to help inform and support and sometimes critique those directions that we choose to go with our individual projects. So there's that value of discourse, that value of approach discourse that helps. And because we value that, I don't know that we have a checklist of things that each project has to go through.

Skip: Right.

Chris: We have checklists for deciding when we go after a project that help us in our decision making. Aside from all of the financial and business end of things, does ... you know, there's a series of questions that help us decide which partner this will best align with. Does this project align with our morals, our goals as landscape architects? Well once we've sort of gone through that filter and the project is here in the office, those levels of evidence that we decide to discover about a project, to investigate about a project, I think they vary from partner to partner. And I think that's one of the beauties of our built portfolio is that we don't ... there's not like a particular ... oh that's Skip's, oh that's, you know ... Every project benefits from the sort of ... among the trust.

Skip: Right, yeah, exactly. The ... I think one of the ... I lost my train of thought, I'll gather it back somewhere. What were you just saying? Oh the idea that ... not having a checklist is ... I think it's really important because you know, this is art and science this profession, and every project is a different recipe. And so the categories ... broad ... you can probably get broad categories that we deal with on almost every project. But the percentage of the importance or impact or need to research each of those may vary completely. You know, something as simple as a contaminated site is a totally different animal than a non-contaminated site. And so the amount of impact that has ... Those different influences will shape the kind of research and analysis phase if you want to call it that. You know, depending on if it's something we already know and we can apply intuitively or more holistically; if it's not, if we need a content expert from outside or wherever it might be, each project has a different way forward into the kind of development and conceptualizing about it.

I mean one way maybe to think about it is rather than a ... it's not a checklist per project, but we kind of ... you know from a research side, I always like to think of us kind of as kind of breaking the set of information down to three scales. And the first scale is really the project-focus scale which is like answering questions or understanding challenges on a project by project basis. So it is, let's research this plant material that's need to _____ ... let's look at this soil contamination problem on this project. And so it is understanding what you need to move forward on that project on that scale. And the goal there is to literally answer the question or to provide that context and then move forward and complete the project. We capture that in the Knowledge Base but it really is very related to that project only. The next scale up is more office-wide questions, things that are coming up again and again like that are across multiple projects. And so what we're trying to do there is build on knowledge from lots of different projects and pull out a salient kind of themes that are continuing to either prove to be successful or challenges or whatever it might be. Or basis of the information like a Knowledge Base even of multiple projects that are helping to inform future projects of the same typology. So that's like a ... that's a second scale. And a third scale would be projects that are not only involving our particular clients in our firm but maybe involving others into a bigger discussion. So this might be partnering with an academic institution to address larger issues; and we are a part and they are a part and we're bringing lots of different people together that we would never normally need on a project but it's providing you a bigger range of contacts. And so that can be economic analysis or that could be, you know, regional geography or whatever it might be. Or it could be things in urban environments just because there are so many different you know stakeholders and kind of interest groups and experts that make up a successful city. So rather than a one size fits all framework, it's really kind of what's the scale of the information we need and also what is the kind of mix of context and influences that we have to deal with. And that will then set the stage forward.

Chris: And I think one supporting statement of that is ... and you probably already know this, evidence-based design is not ... is informing decisions, design decisions throughout the life of the project. I mean it's not just

in the beginning or at a particular bookended phase. It's really throughout the point of the process. We very much want to measure the impact of our design as we're developing it. And so we want to ... and so some of the evidence-based design is actually compartmentalized within some pre-built problem statements of the site. It may already be the standard impervious surface ... you know, certain calculations that need to be met, sort of formulas that need to work out. So in a much more grandiose scale, there ... that level of evidence is always ... it's revealing itself throughout how we ... like okay, we're putting in trees, well we're not just dropping in a circle on a plan, that tree has information associated with it and it has values that feed into some of these pre-built site restraints that we know during the design process. So that evidence of the impact of our design solution into this site is being measured. And taking into consideration when the conversation's happening, you know are we meeting the goals of the project, are we on the right track? So I think just adding another, you know sort of granular level but in a way that it's being built into our process. So years ago when that circle was drawn, that information may have been intuitive by someone. Whereas today, the person still may intuit at the quality or the skill level of designers is still very high as it was previously. But the reason for embedding that information, that evidence is that we need to be able to clearly articulate the result of our design. It's going to be, and I firmly believe and I think probably other firms have said, have talked to you, have thought this as well ... if not already, I mean it's not enough for me or any partner or any landscape architect to stand in front of a client or a community group or anyone and say, "this is going to work because I say so." We have to support it.

One of the ways in which we support that and substantiate that is with data that measures the successful pieces that help remediate some of the problems that the site has. Right? So that's a very ... that's just an evolution example of information that used to be conveyed verbally through myself as a designer or through a consultant, an engineer, whomever. Now all of that needs to be really embodied in this product that we developed. So the evidence is not only informing our designs, it needs to actually come from the product that we developed.

Skip: You know, there's a bit of a market ... I mean there's becoming more of a marketplace requirement for this type of level of kind of accuracy of information or accountability of information if you will. And I think it's ... in some cases it's still ahead of the pack to kind of be able to offer this to a client. But it may be not so long down the road that they are requiring it. Like how did your project perform in this city? You know it could be ... I could see that being a question five or ten years from now from a, you know city, saying "show me your data, show me your performance data." You know, it's like what you would do if you were an engineer. (Chris nods in agreement). Or you know like ... you know, this is you know ... That may happen. And so I think ... in some ways that can be really good. It sometimes ignores a lot of the work that got to that. And so there's a lack of ... it can sometimes kind of simplify the process to the point where it looks either easy or it doesn't look like there's a lot of rigor in it. But I'm just speculating ...

Chris: No no, that's fine.

Skip: ... that there could be a future not too long down the road where we have to submit not only our resumes and our project examples but we have to submit our project performance in some ways in terms of stormwater gathered, CO2 captured, you know, runoff quality improved. And I think that, you know, one of the things that ... You know, again I'm interested in that kind of dialogue between practitioners and academics ... that there's two very different kind of definitions of research between academics and practitioners. Academics tend to dive very deep into single topics and don't see how they necessarily relate to others. Practitioners are all about

the interrelationship of things, so they typically go very shallow and wide in terms of what it impacts. And the reward mechanisms for both are based on that, like we don't often generate new research, we do occasionally but it's rare. We often apply existing research whereas ... and we're rewarded for that because the client's not going to pay us to go la-la-ing around generating research that doesn't go with the project. An academic has got to get no benefit to, you know, regurgitating existing research, they're not going to make tenure. So those two reward structures exist and they don't necessarily help each other. And that's ... But if you can find a way to bring some of those topics together, where you can get mutual benefit ...

But we are branching in some of the performance aspects, we can generate new research. So that's I think a very exciting thing about, you know in terms of you know, evidence if you want to use it in that term. Practitioners have the ability I think even above academics to utilize built projects and even planning projects to develop performance data, whatever data it is and draw conclusions from that act of making something and designing something. So I think it's a really interesting place where we might be going, where we're trying to go. Because you find that that helps the design process but also helps explain your project to non-designers because they don't always care about the design aspect but they do care ... they understand what it does. And if you can explain that better, then it's usually a benefit.

Elise: Can you describe how the directors get kind of inserted into project by project basis. I mean, all of your (*referring to Skip*) projects obviously benefit from a sense of research, but how do you create input into some of the other projects that maybe you're not on?

Skip: Well maybe I'll start it and you can ...

Chris: Sure sure.

Skip: One of the things ... I think that's ... What you've you know started with your question is kind of back to what Chris said about the fact that everybody has kind of a different approach, a different role in the office and among the partners. I'm a design billing partner. So Director of Research for me is another function I serve, but I do project work also. Fortunately I have Karl and others who act as our research team who, if I'm not on another project, we have ... we are actively engaging in each project with ... you know kind of at the beginning, what are the challenges? What is this project all about? What are the challenges? Can we develop a kind of a research framework that answers the needs of the project? And then what can we pull out and maybe want to explore in greater detail? It's kind of those different scales. And then Karl and others in the office that are kind of our research ... principle investigators if you will, can dive in with a little bit more detail on those projects. But we work with the project team, so it's not like these guys do all the work for them. You know, they're really there to help facilitate. You know, Karl is kind of like the über-facilitator. So he can easily do all the work for these other project teams, but he'd collapse. So you know, the idea is that he's helping them with his expertise in terms of knowledge management, you know, and his background in kind of resource management to helping the teams answer their immediate questions. And then he's the overall eye who pulls some of these big topics out with me. And so I'm inserted in other projects kind of through the research team. And you know the idea too is as we work together as an office, I think there's been a really ... You know there's a desire to do that anyway, so it's not like I ... like if I wasn't involved, that wouldn't happen. I mean there's very much that desire. And in many cases a requirement to do it. So ... but the ... you know, the other director positions are different than me.

Chris: Yeah, I think that's what's interesting, you know, there's some that are informal and there are some that are formal. Our Director of Green Infrastructure, he has a ... part of ... he's actually ... His role, the things that are under his purview, one of the things under his purview – because he has a lot. In our go, no-go checklist – when I say go, no-go, I mean the filter that when projects come in the door we all sit down as partners and with the marketing department and go through and evaluate. One of the things is this category of green infrastructure, right, and these are, these are sort of articulated pieces. You know, is there an opportunity for: insert the appropriate green infrastructure phrase here? I won't try to say it because I'll embarrass myself (*laughs*).

Skip: You're not a simple thought (*laughs*).

Chris: I'm not as smart as Steve is (*laughs*). But what that means is that there are actual then built in times, much like there are for quality assurance and quality control of just documented production, they are actually during the design development and design documentation stage, SD and DD. Our Director of Green Infrastructure will schedule meetings with that project and they will review problems that they are addressing and use ... utilize Steve's expertise as an engineer (whom has been in the industry for a very long time), he's tremendously knowledgeable we've had a relationship with prior to him joining us.

Skip: Yeah he's on the technical advisory committee for both LEED and SITES, so he's the only person on ...

Chris: He's an invaluable resource.

Skip: Yeah, so he's also ...

Chris: And he ... In his area of expertise, you know, he's referred to as the water guy, you know he's ... So when those issues that are consistent through all of the projects ... there's always stormwater management issues, there's always particular opportunities for us to exploit a problem into an opportunity, and leverage Steve's knowledge. But that's scripted, that is built in, Steve meets with every project to make sure that those opportunities are being evaluated where they're available and they're not. That's formalized. Skip's interaction as Director of Research – when in that role, not in his role as designer – it's a little more informal. And a project, again because the individual will sort of decide which things need to be further delved into. Then go to Skip, “hey I'm really interested in ...”

Elise: Okay so that's initiated by the designer?

Chris: Initiated by the designer. There are some in my ...

Skip: We may go chasing a project that looks particularly interesting, you know, they don't get to us fast enough so it's like we won't let kind of cool things escape (*laughs*). But it is ... it's led by the project team because it's really trying to infuse research throughout the process and it's not ... so it doesn't get held up or log-jammed by like me needing to be there. You know ... and it's ... We're really about facilitating the project teams doing their research and helping them to do that. If someone else is doing it, “well okay, you should talk to them because they just did that, so you guys could go chat.” So it's a facilitation, it's bringing in the expertise and getting the

resources like Karl and so forth. It's, you know, contacts I have outside. It's ... Again, it's ... and it's afterwards, how do we share that? So it's knowledge-based, it's articles, it's presentations, it's, you know, conversations in studio so ...

Chris: It's interesting, I think I almost want to recant my earlier statement. We have more of a structured evidence-based design framework than I thought, as we're talking about it.

Skip: *(to Elise)* So thank you for that.

Chris: Yeah, thanks. I mean ...

Skip: Alright, call marketing and get them in here, we need to rewrite that part about.

Chris: Yeah holy jinkies ... Yeah we really do. It's pretty cool. And then lastly my role is not as formal, sometimes it's more logistics.

Skip: He just doesn't know.

Chris: I just made it up. Mine is ... ranges ...

Skip: Actually that's Steve's job ...

Chris: ... mine ... My involvement in projects generally range from instructional, as in making sure that those on the project team have the necessary technical skills to develop and document the project. From a use of the digital tools whatever they may be. But then there's also the consultative in using the particular tool to exploit a particular piece of evidence to inform a design decision. For example, a simple example might be patterns, call it paving patterns. You know, okay, why are you sketching? What do you want to sort of start with? What's influencing this paving pattern? Is there a particular element in nature? Some artistic aesthetic piece that you would like to ...? And then my role will be figuring out how to take that ... that informing quality and then push it through into the design pattern using digital tools. And showing people how to do that. I actually find that ... I think that's actually kind of interesting ... now because there are certain patterns that you see and I mean actual like aesthetic patterns that are kind of annoying. And they're annoying because everybody uses them. Right? Some are tried and true and have absolutely ... I'm not talking about like a herringbone brick pattern, I mean that has ... it's appropriate, we've used it a number of times and it's structurally awesome, it's beautiful, great. I'm talking about things like the Voronoi pattern or things that you're starting to see a lot of. Patterns that are automatically generated by some of these digital tools. It's bullshit. So what? There's nothing influencing it. There's no ... There's no evidence behind it. There's no ... there's no factor. There's no aesthetic quality beyond the fact that it's pretty, which is okay, I mean I'm not ... I should take that back, obviously I like pretty things but ...

Skip: Well you know, the herringbone pattern ... you know just talking about, you know kind of analysis and research, the best driving surface is a herringbone pattern.

Chris: ...when oriented properly.

Skip: ...when oriented properly right. So there you go. I mean that is, you know, for any number of reasons there's a lot of different factors that make that case. And so it's an old methodology that was, you know, over time has been proven to do that and ...

Chris: Right. But the thing that ... you know the reason to use that pattern, you understand its faculty, right? You understand its utility, you understand why you're doing it ...

Skip: It's the unique characteristics of the material which ...

Chris: Right. You understand the material, the arrangement of the material, the structural integrity of the material, the aesthetic quality of the material. All these things, you know because they've been proven. And I think that part of that is that today it's my challenge in showing people not only the value of some of these digital tools that can be used to explore these patterns but then making them meaningful. Don't just make the pattern because there's a button that says Pattern One and it looks cool. Okay that's all well and good but what else? What ... how did you come to that pattern? What problems is it solving? What value is it adding to the design process? Show me the evidence.

Elise: Can you give me an example of the digital tool that you would use?

Chris: Well one of the ... We use quite a few. The standard production tool is sort of AutoCAD and Revit and Civil 3D and those are production tools. In the last few years we spent a lot of energy looking at ... Because we want to be able to incorporate those influences into meaningful design decisions, we've looked at things, mostly a lot of parametric tools such as Grasshopper for Rhino to plug in. Rhino which is a great three-dimensional tool, we use a lot. But the value of that is not necessarily that you can, you know make some stuff move around on the screen. The beauty is that you as a designer can start to choose, you know: I want ... I've done some evaluation of pedestrian patterns through here and I want that to influence my paving patterns. So now I can take some of those ... that data of how people are moving, feed it into my design process and use the paving pattern to now influence movement. So that becomes interesting. That's an interesting problem rather than just picking the direction of the stone. It could be ... It also could be simple that, you know I want ... this is on a water front and we're doing ... I'm so embarrassed that I don't know this ... in Rio, it's the wavy paving pattern ...

Skip: Oh, I'll think of it.

Chris: It doesn't matter. But I ... I mean I can imagine ... (*gesturing a wavy pattern*)

Skip: ... the really colorful riverfront one ...

Chris: Yeah ocean front.

Skip: Yeah it'll come in a second.

Chris: The idea there is that you have an influence from something you have, whether it be aesthetic or environmental, there's an influence that you can then start to drive into your pattern. You can imagine those are the types of things that I find interesting rather than ... they're also efficient. The tool now ... the tool is in my hand with a pencil in it drawing a zillion little geometric shapes in a particular arrangement to make a larger pattern. I can hardly ... it's part of the tool's power to do that. But the beauty of it is in my What makes it beautiful and meaningful is how much I bring into it of influencing why it's doing it, not just make the wavy pattern ... on the water. But we use that a lot. And because it helps to focus the question of why you're doing something. In my experience here ... I've been here twelve years, thirteen years? That has always been the fundamental question: why are we doing this? And you have to be able to substantiate that with some type of evidence. Whether that evidence is analytical or artistic integrity or whatever it is. That value needs to be articulated on why you're doing something. And a lot of times there's no wrong answer, right? As long as you can say why. The wrong answer is not going to be able to say why, that's when we sort of get concerned (*laughs*).

Skip: Well I think the wrong answer is, you know in some ways is not taking advantage of these tools to actually say whether or not you arrived at the answer you thought you were going to. I mean, you know, one of the things you persist on is, in some of this parametric modeling is: you have a bench, here's the design of it, I can cut it this way it's going to yield x pieces of granite. Here are several others ways to cut it that are more efficient. And that analysis, you know the design looks exactly the same but the fabrication of it has been enhanced greatly by the efficiency of that analysis.

Chris: Yeah some of that evidence ... I'm mean, would you call that evidence-based? I guess you would.

Skip: Well I think, I mean evidence-based can be wildly broad in some cases. I mean ... And I think some of it is just really ... it's ...

Chris: I guess you can. Because it's determining ... One of the beauties is that some of these tools allow us to maintain greater control over the design, right? So by the evidence that it reveals, by putting it through a certain amount of tests ... We'll design a bench ...

Skip: Well that ... you hit it, because it's sampling number ... It's always something as dumb as sampling number. Evidence to me: you do it once, you could have gotten lucky, you could have hit it right on the head. Whatever I did, kind of repeat it, I don't know. But by sampling, you know, doing this added layer of sampling ... I've tried this thirty-five times and this is the best, okay I like that. And in research, you know the bigger your – I guess N number whatever it is, the number of samples – you know, the more accurate or the more conclusive you can be about what your findings are. And so I think the tools not only provide the evidence in the first place but they provide that analytical sampling that you can't physically do by hand to the level that some of these tools – parametric tools – can do. And so it may end up to be the same thing you thought you could do but, boy, now you know for sure it's...

Chris: And now you know and you also have ... you're less dependent. You can go to the manufacturer with much more. I mean that's the level of evidence I guess. You're going to the manufacturer or the fabricator with on a much higher degree of information, of accuracy.

Skip: And you're talking their language.

Chris: Right.

Skip: You know a lot of times as designers, when we interface with, you know, people that make things and engineers and so forth, evidence is the universal ... Like you know, their design is ... can be very subjective to many people especially, you know the hardcore, you know kind of builders and makers of things. And the ability to bring that to them, it's a common language that, you know yields to more accurate results and better collaboration.

Chris: Well it also allows us to – and I'm going to use this term in a positive way – it also allows us, when we are required to, to not only optimize the value of the product that we are delivering, but sometimes value engineering. We'll do it, right? Instead of someone else. So we can run it through this process and we can say – let's take a simple example of a bench or even a paving pattern – and say, "oh you can't, it's too many cuts." Well we already actually have optimized this in such a way that not only are we achieving the aesthetic quality that we wanted but we've minimized waste. So waste went from forty percent to ten percent. We already know that and if we can substantiate that with what we've done because it's built into the process. Sometimes it influences design decisions in such a way that we'll design something, we'll want to bend a piece of wood a certain way or we sort of expand it. And because of the research we previously have done about a material, which is available on the material library because we have a librarian, I mean that ... just infrastructurally that's pretty amazing that we have that resource available to us. And then knowledgeable consultants will realize: okay that material doesn't perform the way in which we want it to. So we have to change our design. Or, which is the more exciting case, we have to figure out a way to manipulate this material to get what we want. Just because it hasn't been done before doesn't mean that it can't be done. So now there's a jump off point from: okay we know what the evidence has told us, it can't bend that way – I kind of want it to anyway. (*laughs*) Right? So ... And that's what we did in Director Park in Portland. Ipe right? Regardless of where you fall on the spectrum of good, bad or not; it's the material that was chosen. And it's chosen for that particular use because of its ... all the good factors about it. But it doesn't bend or we said it didn't bend. We collaborated with ... And we were like: well we want to bend it. Period. It has to bend.

Skip: Just because they told us it couldn't (*laughs*).

Chris: Yeah, just because they told us it couldn't. Well we wanted it to anyway. We like it, it's beautiful. And we had wanted to make that design gesture before but we couldn't find the right people to collaborate with. So we had done some research, we finally came across ... it wasn't a big corporation, it wasn't a giant fabricator, it was this artist from pacific northwest. They are no stranger to manipulating wood with the purpose of ship building or whatever. He got that. He's like, "you know I see what you're doing. I think we can do this." And it was a rather complicated process but he understood the intricacies of bending the wood in such a way that it didn't violate the structural integrity of it or ... We did it. And so this was new evidence that we discovered as a result of being ... as a result of disputing what the evidence had told us at the time. So when we say: in this particular example evidence-based design doesn't play a role in our design process, I mean, apparently it does right? (*laughs*). But I would think again maybe circling back to an earlier statement that I had made ... I think it depends on which designer you're talking to, you know, and how you sort of qualify it. Some can probably put

a bow on it and box it up pretty clean. Others, it sort of has blurry edges and I think I like to operate with blurry edge area. As probably evidence from this conversation (*both laugh*).

Skip: Well and I think, you know given the range of things that landscape architects deal with ... You know, where you apply ... you know ... There is no one place to apply it . I mean we ... Our firm, one of the things I would say we ... absolutely it's the heart and soul of our office is we build stuff. Like we don't just plan stuff and we don't just do, you know renderings or whatever. Like we design everything to be built. And so like the research and evidence-based design approach in concept: yeah absolutely during development absolutely, during client communication absolutely. But it's also an understanding of fabrication and how it's installed. And they are at least each a little bit different. And the tools may be a little bit different. And the scholarly contact for one may be replaced by others. But again it's that idea of critically evaluating the information over and over again until you either get proved you cannot do it, just give up (*laughs*); or the design will look the same knowing though the difference ... or the design will be impacted, can you live with that? And so it's applying those critical thoughts throughout the process because we ... you know, we build stuff. I mean that is ... craft in building is what it's all about because we don't like to see stuff stay on paper, you know we like it go in the ground and it has to go in the ground for a hundred years or more. You know, so stuff is built to last. You know, even worrying over, you know like teeny little gaps in the wood. You know it's like the wood is this way, it's got to fail; the wood is this way, it's fine. You know it's like it's all part of the process. You know, some of it is evidence from 2000 years ago and some of it is evidence of when it was just you know brought about in research you know yesterday. So ... and it's you know, how do you tap that information? Because there are just people that are smart everywhere and you try and pull them in, you know, to help out but ...

And we try and learn from others. I mean I don't know if Karl mentioned the Living Cities design competition? It was one that we did a couple years ago, we won an award it. It was done by the group that sponsors the Living Building Challenge, the net zero buildings. They decided to do that for an eco-district in the city of your choice. You could, you know, can we pick this spot in Philadelphia ...? And that was interesting because unlike most sustainability criteria systems which are kind of ... you cherry-pick your best things; this is ... you had to meet all twenty-one criteria or you got ... you didn't get it. So it was all or nothing. This was really just was a planning project but it was everything from habitat, urban agriculture, storm ... net zero water, net zero energy, all that stuff. And a lot of times these like criteria, they all sound great but many times they fight each other: like open space versus energy production and housing versus agriculture. So it was literally like, you know finding the sweet spot in a particular area about how all of those factors came together. And so that little research design competition project we did is still helping us I think in terms of those conversation dialogue and has informed some other projects that we've done. So in some cases we will dive into these little kind of experiments even if they're not leading to an actual project. We'll try and do those you know, in addition to keep ourselves kind of aware of what the latest is going on and ways to apply knowledge in a new way.

Chris: You know I was just thinking ... I remember talking to an architect ... and this particular architect ... I was asking about their process, their designing process. And I think it's not necessarily unique but the way in which he said it always resonated with me, in an interesting way. He's like "for us it always ..." and this is the architect speaking, he said "for us it always starts with programming, program programming, what is the ... what's the ... what are the requirements of the building? What does the client require? What are the performance requirements? What are we ... how many ... percentage of retail, percentage of residential?"

And I was like, “is that always how you approach ...? He’s like, “yes absolutely.” And it was ... and this is a very successful, well-renowned architecture firm that I was kind of surprised because the end result is some rather interesting form. And I remember asking him, “you guys are sort of known for your interesting building shapes, how do you still maintain that level of rigor in the program?” And in his case he said, “because I’m the only partner.” You know this is a multinational ... or he was the ... there was two; he was like, “I’m one of two partners.” And they have over a hundred _____ people in Europe and India. I found that interesting and that was a deliberate decision. And I think when I started to compare that to our structure, I started to realize that perhaps that’s why we can’t necessarily put a bow on: what is your definition of evidence based design, what’s your definition of the process? Our process is valuing the input of our entry-level designers, our mid-level designers, and our partners and the variety that’s offered there. And providing frameworks for discourse about them whether it be in the project or in a culture, in our office culture. We have a group that actually ... it’s called ... quite literally called Theoretical Basis and one of the topics that they discuss is what are the things that influence our designs and why are they important? Are the things that were relevant fifteen years ago, twenty years ago, thirty years ago, is it still relevant today?

Elise: This is a group in the ...

Chris: The group in the studio. We have it once a month, it’s in the evening, after our monthly board meetings (which is all the partners and board members). And we have it at the night so that the senior members ... we know that all of us as senior folks are going to be in the office, physically in the office. And it provides an opportunity for us to interact very personally and intimately with folks in the studio we may not have the opportunity to talk to on a regular basis. And we have critical discourse about why are we doing what we do? What are the things that influence our design? We ... And they’re great conversations ... people love them. That was born, it was quite literally born out of the idea from some of the younger staff members who were questioning not in a contrarian way or an argumentative way, but were wondering: why am I doing this, why am I drawing this paving pattern, why am I drawing this bench detail? I don’t ... I’ve drawn it four times, why are you asking me to draw it again? And because we were like, that’s not the type of culture we want. We don’t want to just dictate to people what to do. We hire people for their creative minds not for their technical ability on a particular tool. So we created this vehicle for conversation and it’s been great. You know there’s ... you hear about different opinions and why people ... why we do things, why we don’t things. And understand, you know some ... I always like to ask questions to some folks like: “if you had to redesign and take a historical project _____, if you had to redesign Bryant Park or redesign Johnson and Johnson today, would you make the same decisions? Is there anything that would influence you differently?” And in some cases no and in some cases yes because some of those influences were cultural or a result of a particular political organization, government agency that was in office. When I was in Copenhagen a year ... last year, I had the opportunity to sit with Jan Gehl and I asked him, I said “if you were to write *Between Two Cities* [sic] [*Life Between Buildings: Using Public Space*] today would you change anything? That cocky bastard (*laughs*); he was like “no, wouldn’t change a thing” but ...

Skip: But it’s also an age thing (*laughs*).

Chris: But it wasn’t. But ...! But that’s true. But it’s because ... and he followed it up very, very coy like he’s prone to do, he’s had the opportunity to see those theories tested and built, right? So the evidence of those theories –

which is why he wrote it, why he started practicing in the first place – that he was someone who was theorizing a lot and then began to question: well how do you know this is going to work? It sounds great, prove it. Much like you were saying earlier. At some point, you will be held accountable for the decisions that you're making. How do you then substantiate those decisions or those theories? In his case, he's like "I guess I better start practicing." And not that he was responsible for it but he played a big part in Copenhagen being a bicycle city that it is, so he always said it was a good idea.

Skip: Apparently it is (*both laugh*).

Chris: Yeah, right. Worked out. But place, culture – all of those things coming into play. And I think that's what ... I think that's what we do too is, you know we have theories of how we should approach things; all the partners have different things. We have students coming in from different universities; we have young practitioners in our office of varying levels. And I think at some point you have to sort of meld them together. The partners' job is sort of being the, the focus, the lens, right? I got to pull this together you know? This is what we're paying attention to, this is important in this particular project, this isn't. And sometimes it's a little hard to hear, right? Everybody wants to have (*laughs*) their voice and everybody has an opportunity, but it doesn't mean that it's the partners' job to make the decision.

Elise: I'd like to hear more about these particular implementations like the design think tank kind of thing and the directors that were established. What about the office design culture do you think has, or has not changed because of the evidence-based design concept?

Chris: I think it's ... I think as it's evolved, it's actually required a little bit more rigor. Thinking ... and again you had mentioned evolution and I just ... that's how I always think about it – from beginning to end. I think in the beginning it was much smaller; Very clear two people setting the design vision, this theory that we're going to research, this is what we're pursuing. Found a few people that kind of aligned with that. And so the discourse was probably rich but focused on what those areas of research the founders were pursuing. I might be out of line; I don't know, I'm speculating. I think that as we have grown, more voices, more ideas, and the partnership has always valued that input. But now recognizing that we need to provide some structures for these because it just gets loud and chatty if everybody's just talking, right? How do we relay? And also the conversation style, the design style has changed to. It used to be if I'm one of the founding partners, my team is around this table, we're drawing together. So the evidence, the rationale, the evidence, all of the research that I'm thinking about is being talked about right here. So a clear line of communication. As we've grown, those meetings around the table don't happen quite as frequently. Sometimes it's ... it's a little more challenging to relay all of the ... what you're trying to do on the project, why you're doing something on the project. So that was ... that was sort of where this, the Theoretical Basis group came from. How do we ... how do we re-institute that level of discourse that used to happen around the table when we were a smaller group into the organization we are today. Because culturally we value them. So we had to get approval from the CFO for spending a couple dollars a month on some wines and snacks. You know ... I mean they ... setting the framework with folks who are going to help structure these conversations. Partner involvement as to, you know getting ... how are they going to participate, how are they going to be invited to participate? Setting up a mechanism for this thing to be successful was actually pretty involved. But the idea was growing the culture. I think it's been successful so far.

Elise: How would you say the project team has or has not changed based on the evidence-based design concept?

Skip: Well you know, I think it ... kind of building on what Chris said from the last question was, I think that ... you know the process at least with our paying clients has always been ... there is some similarity because at the end of the day you have to deliver a high quality project in a certain amount of time and you need certain expertise depending on the type of project. So there are always some similarities whether you're a two person office or an eighty-five person office of needing that information and needing it at the right time. The tools make the insertion or the interaction with that information slightly different. Some are ... like Revit you know is a definite skill set that you can't just pick up and do, I mean you have to actually learn. So in some cases I think, depending on the project, to take advantage of these tools or to you know improve our design process, we may require people that have specialized expertise at certain points. It's just a ... it's an evolution forward, it's not a major change; it's just kind of a reality of the way do work now. I think that in terms of the additional support that we have is, I mean we're blessed with an office of this size. Like Karl as library resources, Knowledge Base manager is an asset that like I mean it's phenomenal, I can't tell you how that's transformed the way we do things. We, you know ... landscape architecture firms don't have a lot of profit margin, you know, to work with so smaller firms are not going to have that luxury of having a dedicated individual to do that. We don't even have the luxury of having a large research department. We kind of have to do this in conjunction with our projects and find a way to put it all in there so. But we are adding ... you know we have added people that will support the projects in ways we didn't have before. So it's not ... again not relying on everybody to do everything or bringing in people to actually reach out to these scholarly areas and technical areas and so forth which saves everybody having to be an expert in everything.

Chris: I think one of the things that I ...

Skip: But we still love doing everything (*both laugh*).

Chris: Yeah that's kind of ...

Skip: I love to do everything but you know you can't know everything.

Chris: While I said earlier, we don't have a checklist for every project, for every project; every project team is confident in going to Karl and saying here is the parameters of the project, we need precedent images, research in this particular area with these particular materials. There's a certain amount of information that is gathered. So how has the project team changed as a result of evidence based design? That work load has been directed to a particular person, rather than to stick with saying everybody know everything. Our digital imaging specialist and image asset manager, we can go to her and say, "Sahar [Coston-Hardy], (she's also an extremely talented photographer) ..." We can say to her, "Sahar I need precedent images of this is the type of thing I'm working on; get me this." So now instead of a landscape architect or landscape designer spending a large amount of time on harvesting, they can spend a focused amount of time deciding what needs to be harvested and request that of a person of a resource that's available to them which is either our librarian asset manager or digital asset manager. That has been quite a huge evolution in the project team.

Elise: Have you seen a change in projects or clients over the years based on this growth in evidence based design types of projects and types of clients?

Skip: Well I can say that, you know if nothing else, you know clients have evolved in expectations particularly around I think landscape performance. They're still not to the level that we think at in terms of what it's capable of but it's a long rise in terms of sustainability from where they were fifteen to twenty years ago so I think that they are ... and some of that has reached a level of communication that the clients are aware of it or seeking it out or hearing from others that these things are possible and therefore you need to do this because I want that ... type of thing. I think there is some expectation of the ability to tap into things that the clients (starts laughing) may not be aware of what they're asking for. And I'm trying to have a ... let me think of an example of that ... but I don't know if it's necessarily dramatically changed. It sometimes has directed the production of visualizations of the projects because in some cases, it's not the clients who are demanding it, it may be the agencies reviewing the clients who are demanding it. And you know there are things like SITES and LEED and so forth that are part of framework that people follow so therefore that has ... those types of things have come into projects. In many cases we were the ones pushing a sustainable approach. There seems to be less pushing of that now; they're much more willing to listen to it or at least understand that. And if you can under ... do it in a way that is quantifiable as it relates to their budget or their outcomes, then you will easily convince them. You know I can accomplish that for X or for no extra or whatever it might be. So I think that conversation has entered in where it wasn't there before. But I don't know do you have any ...?

Chris: I don't know that they, that I could say that I've noticed a drastic change. I may also not be the most qualified to respond to that question. I would say that some of the evidence – paraphrasing what you said – is being requested by the client. Alright so how have projects changed? I don't know that twenty years ago a client was saying that a project had to meet a certain set of requirements. Today we are seeing projects that need to meet a certain set of requirements that are measurable that can be proven and qualitative ... is that the word? Quantitative? Quantified.

Elise: Do you still have clients who are reluctant to pay for some of the research and gathering of evidence?

Chris: (*almost instantly responds*): Yes, absolutely. There's some ... I wouldn't say all clients; I mean there are definitely projects that welcome that. But I think that especially with the changing economic times, all designers I think across disciplines are being asked to stretch a lot further on the same if not less contracted income. I think that, that's why you're seeing some ... I think that's why you're seeing the development of a specific research department that has its own budget in a lot of disciplines or a lot of different practices. You know OMA's got a research arm. A lot of the collaborates that we work with have the research arms that are partially funded through alternate revenue streams right? So they'll provide some type of education opportunity or something to help generate revenue just so it can sort of pay for itself, so that then the research for projects can be fed through that and the cost is then offloaded somewhere else.

Skip: Yeah I mean we've looked at, or have looked into it and are looking into the ideas that are a non-profit version of us that allows us to receive grants that we couldn't get as a firm. The benefit that could then be transferred down to projects ... I mean research on our end is very much about working within the flow of projects. You know twenty-five years ago, twenty years ago some people used to line item CAD operator or

CAD on a bill.

Chris: Sure.

Skip: Like CAD guy was eight hours and that you know ... And now-a-days it would be ... people would like fire you, like what is this? Like you know, it's part of the process?

Chris: The definition of the cost of doing the job ...

Skip: Yeah.

Chris: ...is becoming much more encompassing.

Skip: So research is somewhat of a ... you know we have designed our system to be able to work in the project work flow in some capacity that fits into the budgets of the project. But the expansion of what we would like to do, you know in certain areas, there are some clients that have been expressible in us to do that. For example in Canal Park we're doing post-occupancy evaluation to meet the SITES criteria; that was something that they set up with the client from the get go.

Chris: But in the same respect, I mean we also reached into our pocket.

Skip: Yup, oh absolutely.

Chris: Because we value that research and that ... and the evidence that that ultimately will provide us. We have reached into our own internal pockets to help offload some of that cost.

Skip: Yeah and because it is beneficial to multiple projects. I mean we won't do that on something that's not ... that's not a benefit to other projects. I mean that would not be a wise investment of our time and money but looking at these common threads of challenges, yes definitely. But I will say that, you know clients ... Before, clients might see an image in a magazine and go "I want that design." Now they may go to a website in another city and say "oh wow, they have a Complete Streets manual. I want that on this project." So in some ways the evidence that, you know is out there in terms of best practices, it is up to you to interpret how that might be applied in a particular project. So you know they're not sitting there asking you to write guidelines or somebody to do that like in the case of Canal Park where we helped them craft water reuse guidelines for the city. You know, it is more along the lines, if you are taking evidence and research and other projects and applying it to fit the local conditions so they end up getting the thing they want, they would have no idea how to get there you know. It's like hairstyles; like I want that you know Johnny Depp's hair style, I have no idea how to cut it to get it that way but I want that. And so like the Complete Streets manual goes through the design process of us and it's interpreted and it's presented and completed in a way that's appropriate to the project against the goals. If we get extra research though out of it, then away we go. So there is some of that I think demand has occurred because there's the sharing of information. I mean like clients in cities look at each other's websites all the time like: does he have design standards, do they have this, do they have that? So we'll get a lot of that and be like, "oh we have these five examples, what do you think of those?" And they're like ehh ... (*laughs*).

Chris: Well and I think one of the ways ... you know on a much larger scale ... Richard Saul Wurman, the guy who founded the Ted Talks, we sit on an advisory board with him and a few other folks. He has just released, in conjunction with a collaborated from ESRI (who is a GIS developer), a website that harvests a lot of his data from different cities and amalgamates it, aggregates it, so that cities can compare themselves to each other. And individuals can then compare, find out information that was previously only available to select few to a larger audience. So that sharing of information ... And the reason I mention it is because they reach out then to practitioners like us and say “what else should we be adding to this? So not only, you know when you think about evolutions of practice and project types and things that we get involved with, this is something that twenty years ago we would never have ... It'd be very hard to have access to this level of information. Now you're looking at it through the lens of: I want to have access to this information so that everyone can make better decisions about something. That starts to, for me it starts to speak to: how can I as a landscape architect, in my little part of the world start to add some value along with other really good landscape architects that may not necessarily be in this office, right? I mean just because we compete against some of our peers ...

Skip: Right.

Chris: ... doesn't mean we don't respect them. They do really go work. So how can, along with other disciplines and other people start to bring that collective knowledge together to solve real problems? So it's not about: we're going to fight over this project; we're going to both contribute to the solution from our collective experience and knowledge. Those are the types of things that I find really interesting. And I think those types of opportunities, I think they ... I think that's maybe where a lot of studios were born out of: very sort of utopian, sharing democratic things together, but then evolved into singular institutions competing against each other. I actually think that you're going to start to see a swing back the other way. I think there's going to be an opportunity for, yes we all have to make money and we all get paid for the services we deliver but I think there's going to be more of those collaborative opportunities based on how you approach a problem and the evidence that you can generate to support that design. And I think it's going to be something like: “OLIN, you know those guys are really good at this. Oh Sasaki they're really good at this. OMA ... whomever, you know Michael Van Valkenburgh, Jim Corner.” All these people that we respect tremendously that we compete against, directly compete against. I think there will be opportunities where it's like, “you know what, they're really good at like X, we should ... there's a problem with space that we could all get together and do something and address and this is what will come out of it.” And that's where, you know you start to think about: okay, well how could we do that? That's where the non-profit research arm comes in: how do you create the think tank?

Skip: And there's a ... there's a national level entity that could do that: it's the National Academy of Environmental Design; it started not too long ago. And I don't know how they're doing but they have ... I mean the idea is really to kind of bring together all this information: academic, practitioner, and so forth. It's really potentially a phenomenal vehicle. But you know we don't have that tradition like the sciences do of sharing information and building on information quite as strongly as they do. And that's kind of the idea, this national academy is supposed to do and foster this dialog and so forth. So I think that's going to be one to watch. It could just end up being a government, you know kind of cool thing that happens. But you know the National Academy of Sciences is a major force in science and so you have the National Academy of Environmental Design could do that for designers. I don't know how long that would take but I think it's really kind of a cool thing that ...

Chris: That's a little bit of a pipe dream; I don't know if it's even possible. I just think it'd be awesome. There are just so many smart people, right? Like gosh ...

Skip: Yeah.

Chris: You know at some point is there something that we could just like get all ... What's the big problem that all of us would be really good at solving? Let's just do that! Right? *(laughs)*

Skip: Well you know on a level like the Mayors' Institute for City Design, have you ever heard of that?

Elise: No

Skip: It's a program that the National Endowment for the Arts funds. And they basically bring designers and engineers of multiple disciplines and other politicians together on a panel and then they bring like eight to ten mayors from cities all over the country to come and present a design problem or a planning problem. And the group basically noodles on it for two days and then they solve it or they provide a response. And you're prevented from, I think a year from soliciting services; so they don't have to worry about you like basically going there as a marketing thing. So like I went to a small scale city one once as a panelist and you know the Mayor of Napa, the Mayor of Bellevue, Washington; the mayor of you know like five or six other cities. They would come with a planning problem like: here's ... and they explained it and so forth. And then the group would like sit there and noodle around for a few hours and come up with an idea. And that was fun! I mean because it's like, you know, here I have competitors in the room with me you know ...

Chris: Yeah I think that's the difference though ... it's not giving away ... you know certain things are a process, right?

Skip: Yeah.

Chris: So we started this conversation, what's ... how has does evidence based design influence your practice? What roles are played in the process? Well you know, some of that's

Skip: Apparently it plays a lot *(laughs)*

Chris: ...theory. Yeah some of that's theory, right? Some of that's, you know, well I do it this way or you do it that way. We have evidence – no pun intended ... Oh yeah, we have a structure that reflects the value that we place on that, whatever flavor any of the partners choose to institute. And that's not proprietary ...

Skip: Right.

Chris: That's the kind of thing that, you know, I would be interested to talk to other people about. I would imagine that everybody, I would hope that everybody has a different answer. But then there's other stuff that is proprietary. You know, the ways in which you ... but those fall into the ... for me they fall into the category of the ways in which you choose to exploit that evidence, whether it's through influencing a design process

or proving a design theory. I think we're very good at using evidence to influence a design theory, a design decision, right? Harvesting information as, you know as we were trained to do in traditional ways and now we've evolved the methods in which we do that. I think, you know as we said earlier, the area of interest now is also using some of those advanced technologies and tools to prove and gather evidence from those design decisions. What did they result in? So there's the input, how they influence design decisions and then there's the output, how did it result, did it do what we thought we were instructing it to? I think the first ... the front end of that we're pretty good at and we're also, you know we're always evolving the ways in which we influence. The latter of those two, the outcome is I think the newer horizon, the newer frontier that we're exploring that's very much the proprietary end. The front end I think ... and this is again and I'll stop talking in a second. The front end is where I find that, for the input of the information is really the most interesting because the tools are available to everyone, right? Ten years ago, fifteen years ago Gehry curved a building; it was like "oh my god, it's amazing!" And ... which it is. But nobody else could do it, not necessarily because they didn't have an idea for something that was similar; they had ... there was no way that people could build it, right? They didn't have the means or the expertise to take that idea through to fruition because the tools weren't available. That's where Gehry Technologies came out of, right? They built their own tools – God bless him. Well now in today's design world, everybody has access to those tools; everybody has them. It's not about some guy sitting in the corner and scripting away, I mean a singular pointer of skill sets. Everybody has those tools and now it's really like: well what do you want to look at? What do you want to influence this? And it's not the ... the value that it adds to the design is not necessarily your mastery of this particular tool; it's how you choose to let it influence or be influenced. What the influence you introduce to it. I've been talking way too long, sorry (*laughs*).

Elise: Talking about that output and the proprietary nature of that, when you find out that a certain implementation has failed in some way, just by doing experimentation and advancing yourselves, how do you balance that knowledge and be able to share that with the field, your lessons learned and advance the field while obviously taking care of that proprietary issue of it.

Chris: Sure. One aspect ... I don't think I will be ... correct me if I ... feel free to say stop talking if I step outside the bounds of our current agreements we have in place. Sometimes it doesn't. In our initial research we're like: okay, what are the things that we want to evaluate about this after the fact? And some of those proprietary things are very much in the developmental stage in ... not only in their technical development but also in sort of their ... lets ... which questions we're asking to prove, which things we're trying to prove out. So we recently put one of our projects sort of through this test filter, through a series of things. And it ... the things that we developed to help measure or quantify these, this evidence they were successful in doing that but it didn't tell us anything we didn't already know. It was like okay ... what it told us was that when we drew those lines of how we thought people were going to move, we were right, right? (*laughs*) And there was no earth shattering revelation. But in that case what came out of it was a process by which to collect that data and quantify that was much faster than previous methods. So previous methods were things that we may have employed on Bryant Park where, with Holly Whyte, we went out and counted people. Ultimately evidence based design there, like we're going out and we're measuring things that exist: post and prior efforts right, pre and post. Harvesting the same information but different methodologies for doing the same thing. Twenty-five years ago it was a very analog process. Today, a very digital process. But still getting similar results. The challenge there is that, okay now we can do that, so what? Now what? Right? How does it ... To me what the next step is then figuring out, is taking that information, applying it to the next project and using it in such a way that, okay we know how this

is going to happen, what happened, how does that influence my design decision if I place something in ... an object here? How do I then influence movement in a different way for whatever purpose? Can I read that back? Is that within the bounds of proprietary ...

Skip: Yeah that's ...

Chris: I don't know if that answers ... does that answer the question, does it get at the question? Feel free to ask for clarity. We've been terribly ambiguous (*laughs*) so you are allowed ... we're getting ... you know I think at least my time is running pretty short. I'm sure yours is as well, so feel free if you need to like narrow us down a little bit here, go for it.

Elise: So what I want to know is how you share your lessons learned with the field to advance the field?

Chris: Oh I see, I see.

Skip: Right, well there's you know ... I think there are ... we want the profession to get obviously better or as good as it can be and in some cases that's, you know just because of the love of the art and craft and the role we feel we play in the shaping the built environment which we think is a better perspective than many others bring and not meaning me, but meaning a landscape architecture. You know, so we want to give the information we can give to others to help the profession because it's better for everybody in the long run, it could even mean bigger market share. So like twenty years down the road you're like ... you have a big benefit for everybody. But you know the idea is that in order to be competitive and you know a content expert that your client wants, it's helpful to share these things. And really probably the best way is either through posts on our website, white papers, a lecture at a conference, articles. And we do that enough that, you know we're used to pulling out information from projects that, you know, we may not even know who the client is, we may not know what the project is, you know all the way up to a specific example and a client if it's okay with them and it's useful to ... So there are many ways to distribute information that don't in any way impact the kind of confidentiality or the security of our client relationships. Or what we may be holding on to, that with others we've developed that are specific solutions. We tend to be more about answering common problems we know that are out there and answering them in a way that is helpful to the profession but not compromising, you know kind of that uniqueness of each project – if that makes sense.

Chris: I think one of the other areas in which we share those findings and sort of add value to the field is speaking to groups that are not just landscape architects. So when we're lecturing and we're going to a conference, it's ... we've found that there's additional value in speaking beyond the choir. Like I don't want to just go speak to landscape architects, they already know the value of the end. So when I go to speak to landscape architects that's where I'm sort of sharing, you know, the types of things that we're working on, it's ... But when you can continue to develop new relationships with other designers in the discipline, in other disciplines rather, like Steve Benz goes and talks to architecture groups for architecture firms. He has a series of lectures that he can give that offers AIA credits, right? So they have an interest. So now that becomes a vehicle for us to get our message in front of architects to not only teach them some of these tenants that we have always held dear: green infrastructure, ecology, why it's important to play with the design. But also that if you need help with it, we're really good at it. And so it's sort of flying the flag of landscape architecture and the value that it adds

as a discipline to those that may not fully understand what landscape architects do holistically. And the most successful ... you know that conversation has been successful when the person on the other side of the table says back to you, “I didn’t know you guys did that. Or I didn’t know you guys knew that.”

Skip: Right, right. “I didn’t know landscape architects even dealt with that.”

Chris: Yeah. “I didn’t know you guys even thought about those things.” And in ... I mean in my world it’s when I’m talking to an architect about Revit or paneling tools or some overly complex, technical system that I happen to know a lot about because of my personal interests. And they’d be like “oh my god, I didn’t know you knew a lot about that.” I’m like “well yeah, I do;” which then becomes an opportunity for us to discuss something more meaningful that I can then come to Skip and [say] “you know, you should really talk to my partner Skip who is great about brownfield remediation; you should see this project that we did up in Napa.” Now all the sudden the conversation went from ... because I was talking to another discipline who may not have fully understood the value that we can bring as landscape architects, my particular area of expertise allowed the conversation to bring a project to Skip who’s now doing something as a landscape architect: one of the large brownfield projects in Northern California. I mean it’s huge (laughs). I’m not saying that’s how it happened.

Skip: Right well and you know it’s ...

Chris: Well I can say it; it’s not true (laughs).

Skip: Because we deal with a ... I mean our subject matter is so complex and a part of a process, it’s actually not that hard to be ... you know like we don’t have to like redact huge chunks of an article. I mean it’s really, you know Chris writes a code for a software that’s really useful to us and we’re not going to give that to people because ... but that’s also a product ...

Chris: Right.

Skip: You know, when we design something it’s all out there for people to see. They may not know that it’s four or six inches of depth of concrete so you can drive on it; this is not like, you know, great state secrets or anything. Because you would never be able to duplicate that anywhere else because it’s completely unique to a project. But the lessons you’ve learned and the things you’ve addressed are very beneficial to the profession because the more people saying the same thing to clients and regulators and so forth, the better it is for everybody. So I don’t find it personally that hard to protect the secrets of the client. I mean we’re very respectful of our clients; like we will not talk about anything for our client unless they’re okay with it. Sometimes is great PR for them, no problem we’re happy to talk it up. But a lot of times the things we can convey to other landscape architects don’t need ... they don’t need to know about the clients, it doesn’t matter. You know, it’s irrelevant. And so I don’t think it’s ... I don’t find it that hard to present evidence based design because a lot of times we want to present it, I mean because it is better. And it’s, you know ... we’re not making a thing, you know we’re designing a system and you know, I couldn’t go to somebody else’s park and I’m not going to lift that design up and put it somewhere. I couldn’t do it because I have no idea all of the steps. And you could never explain that in an article or a presentation ...

Chris: Also the desire to ...

Skip: Yeah exactly. And then we don't like to do that anyway (both laugh). You know we're not ... that's not the way we're wired. So it's not like a ... you know, we're doing genetic, you know design here where we're you know literally patenting ... the minute I go up, I make one minute worth of progress I should have patented it. You know, we don't do that. So ... and I think there's a kind of: we are all in this together because we care deeply about, you know people and the environment. And so do our firms we compete with.

Chris: Some of it, I'd love to see crossover. You know I mean, how do we share that evidence with the world? It would be nice to, if I was to forecast five, eight years ... where you start sharing some of those processes of your evaluation and then there starts to somehow be an application in another, seemingly unrelated discipline, right? So one example might be an engineering company that does ... they do the engineering for blast radiuses for buildings, right? So they're pretty knowledgeable about shock waves and how they affect the buildings and blah blah blah and all this stuff. This is a very simple example, it doesn't have a very good ... it's more of a financial gain. Well they somehow became connected with this shipping industry and like they would say ... apparently the way to test the whole integrity of the battleship was to sail it out and like literally detonate tons of explosives in the ocean and so it was horrible for the ecology, took the ship offline, it was super expensive. And so the, the engineering company whom we partnered with who was actually worked on with for the London Embassy ... They were like you know, "we know all about blast radiuses and we could probably think about this problem that you have, United States government." So park your boat here, I'm going to make this little bell that we're going to fill with compressed air, it's going to simulate a shock wave and it's going to do the same exact thing with compressed air from about four feet away from the hull while it's parked. I'm not a naval person I apologize; it's probably not supposed to be called parked (*laughs*).

Skip: (*laughs*) Rested.

Chris: ... while it's parked at the dock. And they can string this thing along the side of it and it can be done in two days and it saves like ten million dollars and you don't have to detonate all the stuff you normally do. So here you're like, okay here's a discipline that did one thing ...

Skip: It's not as fun, as detonating all this stuff (*laughs*), but it's better for everyone.

Chris: Right. But it's better right? So there's this crossover you know. There's another friend of mine who ... Skylar Tibbits, who graduated Philadelphia University in the architecture program. He was the youngest, now the youngest Ted fellow ever. He's like a fellow at MIT; he's amazing at coding and scripting but he's also an amazing designer. He started thinking about certain ways that certain shapes assemble. So we really got into self-assembly which led him into some precedent studies of biology and cellular growth. Which then led to a medical person. Someone in the medical field that was investigating a particular cellular disease that happened when two types of cells assembled themselves and the current medical research is that these two cells must ... one cell must be destroyed for this to not happen, to prevent this cellular disease from happening. Well they sort of came to the conclusion, they're like, "well what if you just put something in-between that never let them assemble." Right? So instead of destroying something ... it's very invasive, radiative therapy. What if you just made sure that they never assembled? They start ... they haven't finished it yet but they're now

getting very close to a solution where these two cells will never assemble and they've done that because Skylar understands, can ... and can compute all of the ... all of the permutations of how these things might assemble – how to interrupt them. The person from the medical field has his resources that he can bring to prove these theories. And so there's this area of investigative research that is happening based on two seemingly unrelated disciplines bringing their skill sets together. That's amazing, right? And ... but I think to do those things, you know, the level of evidence that you need to be able to output a project, the level of evidence that you take into consideration when you input a project is all predicated upon your understanding of that evidence, your skill set right? So when you think about ... you think about somebody like Laird Hamilton, this professional surfer who pioneered this thing of tow-in surfing, right? So tow-in surfing, the problems faced there is that there's these giant waves that I can never surf; I can't get to them but I'm a really good surfer. Okay well what if he just towed me into it with, behind a jet ski? So now he has access to this stuff that was previously inaccessible and now he's over the door for the whole world. But it's predicated on a certain skill set right? So I think in our world, when we talk about these wonderful opportunities, it's really our responsibility to not only take the evidence into consideration but to have a deeper understanding of it, to really study and understand its relevance and how it's influencing our design, why it should be influencing our design? But to even get to that level, to that, to access that stuff, you have to be pretty good. And I think that's where we have very, been very fortunate to have access to really smart people and it's why I loved Theoretical Basis group, hearing what they're saying; it's why I love the amount of partners that we have.

Skip: And we troll outside too. You know I think that the thing you mentioned struck me that we, we're tapping a lot more fields than we ever used to be to be able to tap because of the ability to either talk in the same language, convey information that is of similar units or qualities or whatever. And so we can actually engage the thought process of other disciplines in our work which we couldn't do before. So again going outside the profession, we're looking at evidence based work from other fields that you know, "you know what, I never thought of approaching it from that way. That's a really interesting way." Or "that'll never work, I'm never doing that." You know and so, you know not only is it, you know, experts and other materials but just even experts and you know community outreach, social, you know sociologist whatever it might be. There's a much wider range of potential collaboration and expertise to tap than we had before. Which is you know ... I find it has made some interesting ... You know the idea of the sculptor and the wood ... You know there's a really interesting architect, [James] Jamie Carpenter who's in New York, he's a fabulous designer who really just lighting and intricate light installations. And he did a facade for a building and he was determined to go this way and the contractor in fact, they had no idea what to do and he said, "you know what, metal ... metal like lots of metal and cutting and shaping of metal ... Who's know more about metal?" And they went to the guys who make trains, like locomotives. And they are like, "(scoffs) that? I can bend that in a heartbeat." They like banged out like all these things without batting an eyelid where as the typical building contractor had no clue what to do, was totally overwhelmed, was just like, "it's impossible." And these guys working for the what, whoever makes these diesel locomotives and you know the train equipment, I mean that giant scale stuff like, god that machine can bend that instantly you know.

Chris: And I think one of the beauties of, of where we are today is that we have the ... like Skip is saying, we have the opportunity to leverage the knowledge in seemingly unrelated disciplines in new ways.

Skip: Yeah.

Chris: That's pretty cool.

Skip: Well and you and disciplines ... you give us data that we didn't have before, you know. So... I'm tracking my time ...

No, this ... I apologize. You guys have taken on ...

Skip: Well we've been chatting, we've been chatting ... (*laughs*)

Elise: You've moved the questions right along I didn't really have to ask any; you knew exactly what I was going to ask next. Any ... I'm mean my last question was where do you go from here to continue to evolve the evidence based design approach and you've talked about that a little bit in the firm and a lot outside, what you hope to see in the field and collaborating fields. Any last remarks?

Chris: I think ... I think right now we're sort of ... we're entering into sort of the apex of the, of the, the data influx, right? There's just so much stuff. I think ... again, I hate to keep referencing this digital thing in my phone or in my hand that happens to be a phone as well as a repository for thousands of other pieces of information. But it's changed a culture, right? So I think in the ... what I'll be ... and there's so much. It gets loud, you know. Sort of, what does that do to culture? What does that do to the design process? How does that change how we do things? If it doesn't I'll ... maybe it doesn't. But it's ... for me it's sort of, I hope that the next steps are ... it starts to quiet down a little bit, data wise. And it starts to get a little more focused and there's an understanding and there's no more debate about like, "ahh when I was younger we didn't have phones." I would be curious to see what the conversation would be ... you know, let's have a conversation about how design changed as certain things entered into culture whether it be fire, or the wheel, or the printing press, or the analog telephone, or the car you know. What ... how did these things that became instantly infused into culture change how people were experiencing the world around them and they ... how we were designing them? And what does that mean to designers? To me that's something that ... they're very interesting. And I don't know if we've had that. I think we're at a point in human evolution; we need to start ... we could start thinking about that because I think the last fifteen years have actually been pretty ... I think and maybe I'm biased because this is my era right? (*laughs*) But maybe I'm wrong; maybe it's no different. But how do you respond as a designer to these cultural changes and what's important?

Skip: Yeah I think ... I mean that's really interesting and like, I find that sometimes that just like, "oh my god, there's more data than I could ever possibly use." And a lot of it is kind of the same in some ways and it's ... I mean, so I think literally the data management aspect of it, if we could solve that in a way that was, I don't know, solvent; that would be an enormous step forward. I mean to me in terms of evidence based design I would personally like to see our next steps ... I mean I'm really excited with where we've gotten to here. You know, the idea of Knowledge Base is, it's not only a repository now, we're actually using ... actively using other projects to do the project as a tool because of its capabilities. But I would love to increase the flexibility of this use and by exploring others ways to do it like the non-profit or whatever so that we are more flexible in our ability to do this. So we're not always tied to a project or we're not always tied to something. It would be freeing us up a little bit more to really go to town and expand. I do think that another future thing for me is I would love to be able to attract academics to collaborate with us more often. You know in many ... there are many opportunities to

do that and I think that what we need to ... we're building our kind of Knowledge Base (to use the term again) that will become more and more interesting to academics and understand how it can be used with them. And so I think it ... when we come to a point where they are actively seeking us out to collaborate ... And they do that to some extent but I think it would be very interesting to develop some of those shared mutually beneficial projects in a way, again, that kind of allows us to live beyond just the project schedule. So that's my two cents in that topic but ...

End


Appendix C: Approved IRB

KANSAS STATE
UNIVERSITY

University Research and Compliance Office

TO: Jessica Canfield
LARCP
103A Seaton Hall

Proposal Number: 6764

FROM: Rick Scheidt, Chair 
Committee on Research Involving Human Subjects

DATE: 07/12/2013

RE: Proposal Entitled, "The State and Impact of Evidence-Based Design in Leading Landscape Architecture Firms-Interview"

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written - and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §46.101, paragraph b, category: 2, subsection: ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

Committee for Research Involving Human Subjects (IRB)

Application for Approval Form

Last revised on January 2011

ADMINISTRATIVE INFORMATION:

- Title of Project:** (if applicable, use the exact title listed in the grant/contract application)
 The State and Impact of Evidence-Based Design in Leading Landscape Architecture Firms -Interview

- Type of Application:**
 New/Renewal Revision (to a pending new application)
 Modification (to an existing # _____ approved application)

- Principal Investigator:** (must be a KSU faculty member)

Name:	Jessica Canfield	Degree/Title:	MLA, Assistant Professor
Department:	Landscape Architecture, Regional and Community Planning	Campus Phone:	785.532.7083
Campus Address:	103A Seaton Court	Fax #:	
E-mail	jesscan@ksu.edu		

- Contact Name/Email/Phone for Questions/Problems with Form:** Elise Fagan/elfagan@ksu.edu/303.877.5911

- Does this project involve any collaborators not part of the faculty/staff at KSU?** (projects with non-KSU collaborators may require additional coordination and approvals):
 No
 Yes

- Project Classification** (Is this project part of one of the following?):
 Thesis
 Dissertation
 Faculty Research
 Other: _____

Note: Class Projects should use the short form application for class projects.

- Please attach a copy of the Consent Form:**
 Copy attached
 Consent form not used

- Funding Source:** Internal External (identify source and attach a copy of the sponsor's grant application or contract as submitted to the funding agency)
 Copy attached Not applicable

- Based upon criteria found in 45 CFR 46 – and the overview of projects that may qualify for exemption explained at <http://www.hhs.gov/ohrp/policy/checklists/decisioncharts.html>, I believe that my project using human subjects should be determined by the IRB to be exempt from IRB review:**
 No
 Yes (If yes, please complete application **including** Section XII. C. 'Exempt Projects'; remember that only the IRB has the authority to determine that a project is exempt from IRB review)

If you have questions, please call the University Research Compliance Office (URCO) at 532-3224, or comply@ksu.edu

Human Subjects Research Protocol Application Form

The KSU IRB is required by law to ensure that all research involving human subjects is adequately reviewed for specific information and is approved prior to inception of any proposed activity. Consequently, it is important that you answer all questions accurately. If you need help or have questions about how to complete this application, please call the Research Compliance Office at 532-3224, or e-mail us at comply@ksu.edu.

Please provide the requested information in the shaded text boxes. The shaded text boxes are designed to accommodate responses within the body of the application. As you type your answers, the text boxes will expand as needed. After completion, print the form and send the original and one photocopy to the Institutional Review Board, Room 203, Fairchild Hall.

Principal Investigator:	Jessica Canfield
Project Title:	The State and Impact of Evidence-Based Design in Leading Landscape Architecture Firms - Interview
Date:	July 2, 2013

MODIFICATION

Is this a modification of an approved protocol? Yes No If yes, please comply with the following:

If you are requesting a modification or a change to an IRB approved protocol, please provide a concise description of all of the changes that you are proposing in the following block. Additionally, please highlight or bold the proposed changes in the body of the protocol where appropriate, so that it is clearly discernable to the IRB reviewers what and where the proposed changes are. This will greatly help the committee and facilitate the review.

NON-TECHNICAL SYNOPSIS (brief narrative description of proposal easily understood by nonscientists):

The first phase of the thesis research, which employs focused interviews as its primary method, seeks to gain an understanding four different leading landscape architecture firms' formal "evidence-based design" approaches. Leaders of research within the firms have been identified and asked to participate in in-house, video-recorded interviews. The interviews questions are designed to discuss the basics of the approach, how and why it was developed, how it is integrated into the design process, how it affects practice, and its relevance to the field.

I. BACKGROUND (concise narrative review of the literature and basis for the study):

Landscape architecture is embarking on a new design frontier, one where its practitioners are increasingly being asked by clients to design with credible and defensible evidence to inform design decision-making, ensure design performance, and justify investment (Deming and Swaffield 2011; McMinn 2013). Like many evidence-based disciplines before (i.e. medicine, law, and engineering), landscape architecture is poised to become a more scholarly profession – a profession of evidence-based landscape architecture (EBLA) (Brown and Corry 2011). Individual firms are committing valuable time and resources to developing their own EBLA approaches that effectively incorporate research into the design process. However, little is known about their evidence-based design approach, its origins, its integration into the creative design process, its impact on the firm's business model, and its benefit to the field of landscape architecture. The interview method and its questions are largely based on the work of Brandt, Chong and Martin (2010) who produced a similar study by interviewing experts in architectural evidence-based design.

II. PROJECT/STUDY DESCRIPTION (please provide a concise narrative description of the proposed activity in terms that will allow the IRB or other interested parties to clearly understand what it is that you propose to do that involves human subjects. This description must be in enough detail so that IRB members can make an informed decision about proposal).

Interviews are currently be scheduled and will be performed in the firm offices. They will be video-recorded for the purpose of transcription and possible reproduction of stills and excerpts in the final thesis document and deffense presentation. Fixed interview questions (see attached) will form the foundation of the interview. Potential questions to further the conversation are listed below the fixed questions, some of which are firm-specific. Interviewees will be asked to sign a form of consent and a

video release form at the onset of the interview.

III. **OBJECTIVE** (briefly state the objective of the research – what you hope to learn from the study):

Explore the approaches firms have developed to incorporate research into the design process. What methods, models, frameworks are currently used? What opportunities and challenges are presented? What changes can be implemented by other firms to evolve their own evidence-based design approaches. I want my audience to recognize that EBLA can be profitable and efficient while increasing effective communication with clients and across disciplines; that doing research and publishing findings adds to the body of knowledge of the field and is valuable to the advancement of the profession.

IV. **DESIGN AND PROCEDURES** (succinctly outline formal plan for study):

- A. Location of study: **Design Workshop office, Denver; Design Workshop office, Aspen; Mithun office, Seattle; Sasaki office, Boston; OLIN office, Philadelphia.**
- B. Variables to be studied: **EBLA approaches, components of the approaches**
- C. Data collection methods: (surveys, instruments, etc – **Video-recorded interview**
PLEASE ATTACH)
- D. List any factors that might lead to a subject dropping out or withdrawing from a study. These might include, but are not limited to emotional or physical stress, pain, inconvenience, etc.: **inconvenience, proprietary information, absent**
- E. List all biological samples taken: (if any) **none**
- F. Debriefing procedures for participants: **results and findings published in thesis and disseminated to participating firms**

V. **RESEARCH SUBJECTS:**

- A. Source: **4 landscape architecture firms under study: Design Workshop, Mithun, Sasaki, OLIN**
- B. Number: **4-8 (1-2 per firm)**
- C. Characteristics: (list any unique qualifiers desirable for research subject participation) **Principals of the firms and/or leaders of research efforts**
- D. Recruitment procedures: (Explain how do you plan to recruit your subjects? Attach any fliers, posters, etc. used in recruitment. If you plan to use any inducements, ie. cash, gifts, prizes, etc., please list them here.) **Establish a firm contact person for each firm; write "gateway letters" soliciting participation; identify interview subjects through firm contacts (if not already known)**

VI. **RISK – PROTECTION – BENEFITS:** The answers for the three questions below are central to human subjects research. You must demonstrate a reasonable balance between anticipated risks to research participants, protection strategies, and anticipated benefits to participants or others.

- A. **Risks for Subjects:** (Identify any reasonably foreseeable physical, psychological, or social risks for participants. State that there are “no known risks” if appropriate.)
Sharing firm's proprietary information without consent
- B. **Minimizing Risk:** (Describe specific measures used to minimize or protect subjects from anticipated risks.)

Assure the participant that it is possible to refuse answering a question if they are uncomfortable divulging the information.

- C. **Benefits:** (Describe any reasonably expected benefits for research participants, a class of participants, or to society as a whole.)

Introspective knowledge and learning about the processes and impacts of the topic discussed. Recognition for academic collaboration. Recognition for participation alongside other leading landscape architecture firms. Complimentary copy of thesis book with findings and conclusions

In your opinion, does the research involve **more than minimal risk** to subjects? (“Minimal risk” means that “the risks of harm anticipated in the proposed research are not greater, considering probability and magnitude, than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.”)

- Yes No

VII. CONFIDENTIALITY: Confidentiality is the formal treatment of information that an individual has disclosed to you in a relationship of trust and with the expectation that it will not be divulged to others without permission in ways that are inconsistent with the understanding of the original disclosure. Consequently, it is your responsibility to protect information that you gather from human research subjects in a way that is consistent with your agreement with the volunteer and with their expectations. If possible, it is best if research subjects’ identity and linkage to information or data remains unknown.

Explain how you are going to protect confidentiality of research subjects and/or data or records. Include plans for maintaining records after completion.

Interviewees enter the interview process knowing the interview will be video recorded. They sign an informed consent form as well as a video footage release form understanding that the video footage, in partial motion clips or in stills, may be used in the final thesis document and/or the final thesis defense presentation. Raw video and audio footage will otherwise be kept in personal storage. All information divulged should be done so knowing that the transcripts will be published and the video footage will be used for academic purposes.

VIII. INFORMED CONSENT: Informed consent is a critical component of human subjects research – it is your responsibility to make sure that any potential subject knows exactly what the project that you are planning is about, and what his/her potential role is. (There may be projects where some forms of “deception” of the subject is necessary for the execution of the study, but it must be carefully justified to and approved by the IRB). A schematic for determining when a waiver or alteration of informed consent may be considered by the IRB is found at

<http://www.hhs.gov/ohrp/policy/consentckls.html>

Even if your proposed activity does qualify for a waiver of informed consent, you must still provide potential participants with basic information that informs them of their rights as subjects, i.e. explanation that the project is research and the purpose of the research, length of study, study procedures, debriefing issues to include anticipated benefits, study and administrative contact information, confidentiality strategy, and the fact that participation is entirely voluntary and can be terminated at any time without penalty, etc. Even if your potential subjects are completely anonymous, you are obliged to provide them (and the IRB) with basic information about your project. See informed consent example on the URCO website. It is a federal requirement to maintain informed consent forms for 3 years after the study completion.

Yes No Answer the following questions about the informed consent procedures.

- A. Are you using a written informed consent form? If “yes,” include a copy with this application. If “no” see b.
- B. In accordance with guidance in 45 CFR 46, I am requesting a waiver or alteration of informed consent elements (See Section VII above). If “yes,” provide a basis and/or justification for your request.
- C. Are you using the online Consent Form Template provided by the URCO? If “no,” does your Informed Consent document has all the minimum required elements of informed

consent found in the Consent Form Template? (Please explain)

All minimum required elements included in informed consent form. Reformatted for visual appeal. Portions of the template regarding medical procedures and minor consent are omitted because they are not relevant to the study.

- D. Are your research subjects anonymous? If they are anonymous, you will not have access to any information that will allow you to determine the identity of the research subjects in your study, or to link research data to a specific individual in any way. Anonymity is a powerful protection for potential research subjects. (An anonymous subject is one whose identity is unknown even to the researcher, or the data or information collected cannot be linked in any way to a specific person).

The respondents are knowingly partaking in the interview process and understand that their identities must be linked to the responses in order to establish credibility and expertise.

- E. Are subjects debriefed about the purposes, consequences, and benefits of the research? Debriefing refers to a mechanism for informing the research subjects of the results or conclusions, after the data is collected and analyzed, and the study is over. (If “no” explain why.) Attach copy of debriefing statement to be utilized.

Respondents will be provided a copy of the published findings where the purpose and benefits are explained.

***It is a requirement that you maintain all signed copies of informed consent documents for at least 3 years following the completion of your study. These documents must be available for examination and review by federal compliance officials.**

IX. PROJECT INFORMATION: (If you answer yes to any of the questions below, you should explain them in one of the paragraphs above)

- | Yes | No | Does the project involve any of the following? |
|-------------------------------------|-------------------------------------|--|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | a. Deception of subjects |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | b. Shock or other forms of punishment |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | c. Sexually explicit materials or questions about sexual orientation, sexual experience or sexual abuse |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | d. Handling of money or other valuable commodities |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | e. Extraction or use of blood, other bodily fluids, or tissues |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | f. Questions about any kind of illegal or illicit activity |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | g. Purposeful creation of anxiety |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | h. Any procedure that might be viewed as invasion of privacy |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | i. Physical exercise or stress |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | j. Administration of substances (food, drugs, etc.) to subjects |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | k. Any procedure that might place subjects at risk |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | l. Any form of potential abuse; i.e., psychological, physical, sexual |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | m. Is there potential for the data from this project to be published in a journal, presented at a conference, etc? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | n. Use of surveys or questionnaires for data collection |

IF YES, PLEASE ATTACH!!

X. SUBJECT INFORMATION: (If you answer yes to any of the questions below, you should explain them in one of the paragraphs above)

- | Yes | No | Does the research involve subjects from any of the following categories? |
|-------------------------------------|-------------------------------------|--|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | a. Under 18 years of age (these subjects require parental or guardian consent) |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | b. Over 65 years of age |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | c. Physically or mentally disabled |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | d. Economically or educationally disadvantaged |

- e. Unable to provide their own legal informed consent
 f. Pregnant females as target population
 g. Victims
 h. Subjects in institutions (e.g., prisons, nursing homes, halfway houses)
 i. Are research subjects in this activity students recruited from university classes or volunteer pools? If so, do you have a reasonable alternative(s) to participation as a research subject in your project, i.e., another activity such as writing or reading that would serve to protect students from unfair pressure or coercion to participate in this project? If you answered this question “Yes,” explain any alternatives options for class credit for potential human subject volunteers in your study. (It is also important to remember that: Students must be free to choose **not** to participate in research that they have signed up for **at any time** without penalty. Communication of their decision can be conveyed in any manner, to include **simply not showing up** for the research.)
FROM QUESTION X.b. ABOVE: Although it is unlikely, there is a possibility that one of the interviewees may be a firm principal over the age of 65.
- j. Are research subjects **audio** taped? If yes, how do you plan to protect the recorded information and mitigate any additional risks?
Video and audio footage will be kept in personal storage. The respondents understand that the interviews are recorded. All information divulged should be done so knowing that the transcripts will be published.
- k. Are research subjects’ images being recorded (video taped, photographed)? If yes, how do you plan to protect the recorded information and mitigate any additional risks?
Video and audio footage will be kept in personal storage. The respondents understand that the interviews are recorded. All information divulged should be done so knowing that the transcripts will be published.

XI. **CONFLICT OF INTEREST:** Concerns have been growing that financial interests in research may threaten the safety and rights of human research subjects. Financial interests are not in them selves prohibited and may well be appropriate and legitimate. Not all financial interests cause Conflict of Interest (COI) or harm to human subjects. However, to the extent that financial interests may affect the welfare of human subjects in research, IRB’s, institutions, and investigators must consider what actions regarding financial interests may be necessary to protect human subjects. Please answer the following questions:

- | Yes | No | |
|--------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | a. Do you or the institution have any proprietary interest in a potential product of this research, including patents, trademarks, copyrights, or licensing agreements? |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | b. Do you have an equity interest in the research sponsor (publicly held or a non-publicly held company)? |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | c. Do you receive significant payments of other sorts, eg., grants, equipment, retainers for consultation and/or honoraria from the sponsor of this research? |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | d. Do you receive payment per participant or incentive payments? |
| <input type="checkbox"/> | <input type="checkbox"/> | e. If you answered yes on any of the above questions, please provide adequate explanatory information so the IRB can assess any potential COI indicated above. |

XII. PROJECT COLLABORATORS:

A. KSU Collaborators – list anyone affiliated with KSU who is collecting or analyzing data: (list all collaborators

Last revised on January 2011

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on the project, including co-principal investigators, undergraduate and graduate students)

Name:	Department:	Campus Phone:	Campus Email:
Elise Fagan	Landscape Architecture, Regional and Community Planning	330-877-5911	elfagan@ksu.edu

B. Non-KSU Collaborators: (List all collaborators on your human subjects research project not affiliated with KSU in the spaces below. KSU has negotiated an Assurance with the Office for Human Research Protections (OHRP), the federal office responsible for oversight of research involving human subjects. When research involving human subjects includes collaborators who are not employees or agents of KSU the activities of those unaffiliated individuals may be covered under the KSU Assurance only in accordance with a formal, written agreement of commitment to relevant human subject protection policies and IRB oversight. The Unaffiliated Investigators Agreement can be found and downloaded at <http://www.k-state.edu/research/comply/irb/forms/Unaffiliated%20Investigator%20Agreement.doc>

C. The URCO must have a copy of the Unaffiliated Investigator Agreement on file for each non-KSU collaborator who is not covered by their own IRB and assurance with OHRP. Consequently, it is critical that you identify non-KSU collaborators, and initiate any coordination and/or approval process early, to minimize delays caused by administrative requirements.)

Name:	Organization:	Phone:	Institutional Email:

Does your non-KSU collaborator’s organization have an Assurance with OHRP? (for Federalwide Assurance and Multiple Project Assurance (MPA) listings of other institutions, please reference the OHRP website under Assurance Information at: <http://ohrp.cit.nih.gov/search>).

No
 Yes If yes, Collaborator’s FWA or MPA # _____

Is your non-KSU collaborator’s IRB reviewing this proposal?

No
 Yes If yes, IRB approval # _____

C. Exempt Projects: 45 CFR 46 identifies six categories of research involving human subjects that may be exempt from IRB review. The categories for exemption are listed here: <http://www.hhs.gov/ohrp/policy/checklists/decisioncharts.html>. If you believe that your project qualifies for exemption, please indicate which exemption category applies (1-6). Please remember that only the IRB can make the final determination whether a project is exempt from IRB review, or not.

Exemption Category: 2

XIII. CLINICAL TRIAL Yes No
 (If so, please give product.)

Export Controls Training:

-The Provost has mandated that all KSU faculty/staff with a full-time appointment participate in the Export Control Program.

-If you are not in our database as having completed the Export Control training, this proposal will not be approved until your participation is verified.

-To complete the Export Control training, follow the instructions below:

Click on:

<http://www.k-state.edu/research/comply/ecp/index.htm>

1. After signing into K-State Online, you will be taken to the Export Control Homepage
2. Read the directions and click on the video link to begin the program
3. Make sure you enter your name / email when prompted so that participation is verified

If you click on the link and are not taken to K-State Online, this means that you have already completed the Export Control training and have been removed from the roster. If this is the case, no further action is required.

-Can't recall if you have completed this training? Contact the URCO at 785-532-3224 or comply@ksu.edu and we will be happy to look it up for you.

Post Approval Monitoring: The URCO has a Post-Approval Monitoring (PAM) program to help assure that activities are performed in accordance with provisions or procedures approved by the IRB. Accordingly, the URCO staff will arrange a PAM visit as appropriate; to assess compliance with approved activities.

If you have questions, please call the University Research Compliance Office (URCO) at 532-3224, or comply@ksu.edu

INVESTIGATOR ASSURANCE FOR RESEARCH INVOLVING HUMAN SUBJECTS

(Print this page separately because it requires a signature by the PI.)

P.I. Name: Jessica Canfield

Title of Project: The State and Impact of Evidence-Based Design in Leading Landscape Architecture Firms - Interview

XIV. **ASSURANCES:** As the Principal Investigator on this protocol, I provide assurances for the following:

- A. **Research Involving Human Subjects:** This project will be performed in the manner described in this proposal, and in accordance with the Federalwide Assurance FWA00000865 approved for Kansas State University available at <http://ohrp.osophs.dhhs.gov/polasur.htm#FWA>, applicable laws, regulations, and guidelines. Any proposed deviation or modification from the procedures detailed herein must be submitted to the IRB, and be approved by the Committee for Research Involving Human Subjects (IRB) prior to implementation.
- B. **Training:** I assure that all personnel working with human subjects described in this protocol are technically competent for the role described for them, and have completed the required IRB training modules found on the URCO website at: <http://www.k-state.edu/research/comply/irb/training/index.htm>. I understand that no proposals will receive final IRB approval until the URCO has documentation of completion of training by all appropriate personnel.
- C. **Extramural Funding:** If funded by an extramural source, I assure that this application accurately reflects all procedures involving human subjects as described in the grant/contract proposal to the funding agency. I also assure that I will notify the IRB/URCO, the KSU PreAward Services, and the funding/contract entity if there are modifications or changes made to the protocol after the initial submission to the funding agency.
- D. **Study Duration:** I understand that it is the responsibility of the Committee for Research Involving Human Subjects (IRB) to perform continuing reviews of human subjects research as necessary. I also understand that as continuing reviews are conducted, it is my responsibility to provide timely and accurate review or update information when requested, to include notification of the IRB/URCO when my study is changed or completed.
- E. **Conflict of Interest:** I assure that I have accurately described (in this application) any potential Conflict of Interest that my collaborators, the University, or I may have in association with this proposed research activity.
- F. **Adverse Event Reporting:** I assure that I will promptly report to the IRB / URCO any unanticipated problems involving risks to subjects or others that involve the protocol as approved. Unanticipated or Adverse Event Form is located on the URCO website at: <http://www.k-state.edu/research/comply/irb/forms/index.htm>. In the case of a serious event, the Unanticipated or Adverse Events Form may follow a phone call or email contact with the URCO.
- G. **Accuracy:** I assure that the information herein provided to the Committee for Human Subjects Research is to the best of my knowledge complete and accurate.

Jessica L. Canfield

Digitally signed by Jessica L. Canfield
DN: cn=Jessica L. Canfield, o, ou,
email=jesscan@ksu.edu, c=US
Date: 2013.07.02 16:38:32 -05'00'

(Principal Investigator Signature)

(date)

Potential Interview Questions*

1. Can you please describe the firm's evidence-based design approach?
 - 1.1. Is there a formal strategy?
 - 1.2. How is evidence produced? How is it used?
2. When did evidence-based design first emerge at the firm?
 - 2.1. When did scholarly research become important to the process?
 - 2.2. What sparked this development?
3. When did the need for a formal strategy emerge? Why?
 - 3.1. When was it first realized that a more organized strategy was needed (to make efficient use of literature, research, data, findings, performance metrics, etc.)
4. Can you please describe how the approach has primarily evolved since then?
 - 4.1. What changes have been made to the approach to make it more efficient? More formalized? More marketable?
5. How do you get your designers to share in this mission?
 - 5.1. How are the design teams motivated to use this approach?
 - 5.2. How do the designers know that this approach will benefit them?
6. How do you ensure or encourage that the approach is being used effectively?
 - 6.1. Are there design reviews based around the approach? Are there check-in points? Does someone monitor the approaches use and successes?
7. How does the use of evidence to inform design decision-making affect or not affect your creative design process?
 - 7.1. How do you balance intuition and creativity with evidence-based decisions?
8. Can you please describe how the approach has or has not affected office design culture?
 - 8.1. Spaces? Collaboration? Communication? Atmosphere?
9. Can you please describe how project team organization has or has not been affected due to the approach?
 - 9.1. Different leadership structure? Different tasks?
 - 9.2. Transdisciplinary collaborators?
10. Can you please describe how the development of the approach has or has not changed firm structure?
 - 10.1. New positions? New departments?
11. Can you please describe what impacts you have or have not seen on the types of projects or clients that may have resulted from the approach's development?
 - 11.1. Does the approach favor certain types of projects?
 - 11.2. Do you see a trend in the types of clients you work with since the adoption of the EBD approach?

12. Research takes time and money, can you please discuss how you make research in practice profitable?
 - 12.1. How do you justify the time/monetary commitment to clients?
 - 12.2. Are you finding that clients are on board with this?
 - 12.3. How do you remain marketable and profitable while maintaining your mission?
13. How do you share your research findings internally?
 - 13.1. Is there a department, system, or database where your designers can find studies, data, literature, lessons learned, etc?
14. Do you share your research findings with the field?
 - 14.1. Through what means do you share your findings?
 - 14.2. Do you share raw data and/or lessons learned?
15. In our highly competitive and litigious society, sharing how an experimental design strategy failed could damage your reputation and get you into a lot of legal trouble. How do you balance advancing the field's practices and knowledge with the potential risks?
16. Where do you go from here to continue to improve the approach within the firm or improve evidence-based design in the field?
 - 16.1. What do you see as the future of evidence-based design in landscape architecture?
 - 16.2. What do you or other firms need from the field to make evidence-based design more viable or effective?

* Not all questions will necessarily be asked. Some may be used to rephrase a question for better understanding or as follow-up and/or probing questions.

INFORMED CONSENT

Project Title: The State and Impact of Evidence-Based Design in Leading Landscape Architecture Firms

Purpose: This study is being done as part of a graduate thesis exploring the formal approaches that firms have developed to incorporate evidence-based design into the design process and professional practice. Findings will be documented in the final thesis book and presented during the thesis defense.

Method: One-on-one structured interviews conducted at office location. Interviews are recorded using video devices to assist with the accuracy of your responses.

Length of Study: One (1) Hour

Potential Risks: Possible consequences for sharing proprietary information.

Benefits Anticipated: Introspective knowledge and learning about the processes and impacts of the topic discussed. Recognition for academic collaboration. Recognition for participation alongside other leading landscape architecture firms. Complimentary copy of thesis book with findings and conclusions.

TERMS OF PARTICIPATION: I understand this project is research, and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits, or academic standing to which I may otherwise be entitled.

I understand that the interview is recorded using video devices. I consent to the video and audio recording of the interview in its entirety, and I may withdraw my consent at any time and may request that portions or entire video footage not be published.

I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.

Participant's Signature: _____ Date: _____

Print Name: _____

Thesis Student (Co-Investigator):

Elise Fagan
Candidate for MLA
The College of Architecture, Planning & Design
Department of Landscape Architecture | Regional
& Community Planning
Kansas State University
T 303.877.5911
E elfagan@ksu.edu

Thesis Advisor (Principal Investigator):

Jessica Canfield
Assistant Professor
The College of Architecture, Planning & Design
Department of Landscape Architecture | Regional
& Community Planning
Kansas State University
T 785.532.7083
E jesscan@ksu.edu

IRB Chair:

Rick Scheidt

Video Release Form

Video Release Form for the graduate thesis research entitled *The State and Impact of Evidence-Based Design in Leading Landscape Architecture Professional Practice* by Elise Fagan, supervised by Jessica Canfield.

USAGE: Interviews are video recorded for later transcription and publication in the graduate thesis book. Video footage may be used as a visual aid during the final thesis defense presentation and still imagery may be used in the final graduate thesis book.

I, the undersigned participant, hereby grant Elise Fagan and Jessica Canfield specific permission to publish, copyright, distribute and/or display images (motion and still) of my likeness created as part of the interview process. I hereby grant permission to Elise Fagan and Jessica Canfield to edit, crop, or retouch such video footage, and waive any right to inspect the final production.

I understand and agree to the conditions outlined in this video release form. By signing below, I acknowledge that 1) I have read this agreement carefully; 2) any questions I have about the use of my image have been answered satisfactorily; and 3) I have been given a copy of this form, including any changes or restrictions initialed by me and by Elise Fagan.

Participant's signature: _____ Date: _____

Print Name: _____

Participant contact information (optional): _____

Filmmaker's Contact Info:

Elise Fagan
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Thesis Advisor's Contact Info:

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