

EXECUTIVE SUMMARY

Future-use Architecture promotes human flourishing by designing buildings now to prepare for, adapt to, and enable future change.

Future-use Architecture is a design imperative to construct sustainable environments that promote long-term material, energy, economic, and cultural performance. Future-use architecture embodies a tectonic and performative intelligence that proactively organizes building systems in anticipation of unknown future spatial, structural, and energy needs. It is closely related to other concepts that consider architecture in the long term, including adaptive reuse, regenerative buildings, sustainability and resilience. Future use design thinking synthesizes these strategies by underpinning them with the temporal dimension and long-term consequences of our design practices.

Our Latrobe Prize research adapted grounded theory methods, drawing on three main data-gathering activities.

- We conducted a significant review of the existing literature to understand how other practitioners and theorists have addressed the issues of building for the long term.
- We identified architectural precedents from across the country and around the world that suggested long-term performative value, and thoroughly documented, and graphically analyzed a subsample of them.
- We interviewed over fifty architects, engineers, clients and building users, revealing a broad spectrum of ideas about design for long-term occupation. The transcribed interviews were coded and analyzed, and integrated with the graphic analysis to develop an emergent theory of persistent architecture.

We disseminated our findings and ideas through three primary avenues.

- We produced an exhibition of precedent buildings and interview excerpts titled *PERSISTENT: Evolving Architecture in a Changing World*. The exhibit opened at the Architecture + Design Museum in Los Angeles, CA, and subsequently traveled to Kansas State University, Manhattan, KS.
- We have presented our work at professional and academic conferences garnering much interest and feedback. These include presentations at two AIA conventions, keynotes for the New England AIA awards and the Building Technology Educators Society, among others.
- We wrote peer-reviewed journal articles and conference papers derived from our Latrobe Prize research, with five published or under review for publication to date. These writings lead also undergird a book on this topic that is currently under review.

Perhaps the most gratifying aspect of our Latrobe Prize work has been the earnest and positive feedback from audiences and reviewers, suggesting the topic of long-lasting architecture resonates within the profession and beyond it. Additionally, our research has opened many future opportunities to continue our studies, and to advance these important ideas. As noted above, we amassed a considerable corpus of words, ideas and buildings that address long-lasting architecture, and this body of evidence will support future research. Based on favorable initial reception from the editor, we look forward to a forthcoming book. We won an international competition to curate a new exhibition at the BSASpace opening 21 February 2020. As the title of this next exhibition suggests, *DURABLE: Sustainable Material Ecologies, Assemblies and Cultures*, focuses on the life-cycle implications of material and design decisions of our discipline.

A further measure of our success findings is the additional funding (beyond the matching funds described in our initial proposal) that we secured based on the strength of the research. We secured \$20,000 from the Architecture + Design Museum in conjunction with the Council on Open Building to produce the PERSISTENT exhibition. We were awarded a grant of \$50,000 from the BSA Foundation to curate and stage the DURABLE exhibition at BSA Space in Boston, as well as additional sponsorship and in-kind donations of approximately \$25,000 to date. We continue to apply for additional dissemination grants for the exhibition, book, and other projects as we continue to explore the topic of future-use architecture made possible by the Latrobe Prize.



Figure 1: Axonometric of three historical uses of Orsanmichele, illustrating its evolution over time.

RESEARCH METHOD

No single method characterizes architectural research, instead, scholars and practitioners adopt and adapt approaches from a broad array of disciplines based on the needs of the questions at hand. Architectural research struggles to effectively integrate qualitative and quantitative data, to systematically address uncertainty, and to demonstrate validity. Of course, design itself creates new, highly-situated knowledge through the medium of specific projects, but the resulting knowledge is inherently difficult to generalize.

To rigorously research Future-Use Architecture, the team adapted grounded theory method, which is common in social sciences. This approach seeks not to test a specific hypothesis (as with the scientific method) but to develop an organizing theory. Through interviews and precedent analysis, both practices and projects became the subject and object of research. This section of the report offers a brief overview of these methods, but a complete treatment was published as “Methods of Knowing: Grounded theory in the study of future-use architecture” available at the [AARC conference repository](#).

Literature Review

Throughout this project, prior to the Latrobe selection and after the grant period, the Future-Use Architecture team conducted a significant literature review to understand how previous practitioners, scholars, and theorists have addressed the issues of long-term building. We have collected over two hundred references, including books, articles, videos, websites, and other media. Seminal works include John Habraken’s 1961 *Supports: An Alternative to Mass Housing* to Stewart Brand’s 1994 *How Buildings Learn: What Happens After They’re Built*, Simon Austin and Robert Schmidt’s 2016 *Adaptable Architecture: Theory and Practice*, and Daniel Abramson’s 2016 *Obsolescence: An Architectural History*. The complete bibliography constitutes a key component of our own writing and will aid future researchers investigating persistent architecture.

Case Study Analysis

Over the course of the project, the Future-Use Architecture team identified over one hundred possibly-relevant architectural precedents from around the world which suggested long-term performative value. We screened projects for relevance and availability information, including the possibility for visits and interviews. We then developed a consistent style and prepared architectural drawings of approximately forty of these projects. These common representations served as the basis for a series of diagrammatic graphic analyses, for example of structural pattern, space allocation, and fenestration. To move beyond the specificity of individual projects, these common diagrams were combined, compared to each other, and analyzed through a series of graphic matrices to identify common patterns and principles that support long-lasting architecture.

Structured Interviews

The Future-Use Architecture team conducted over forty structured interviews with over 50 different architects, engineers, clients, and the building users drawn from our list of case studies. The list of interviewees includes architects whose work manifests design attributes

from the list above, and people from institutions dedicated to long-lived buildings, such as university facilities planners, government agencies, and leaders of religious communities. We structured the interviews around a consistent set of questions, while allowing each conversation to flow in its own wonderful direction. The questions are:

WHERE has your work considered change over time? Can you suggest specific projects should we talk about?

WHY are the buildings you've worked on—whether new, renovated, or buildings in general—worth keeping?

HOW does the design process change when considering long-term future change?

WHAT design strategies and project attributes enable long-term future change, and which preclude or challenge it?

WHO prompts considerations of future change, who benefits, and who pays?

WOULD you be willing to share documentation with us to support our research, and could we contact you with any follow up questions?

Our interviews yielded over 2,550 minutes of recorded conversations, revealing a broad spectrum of ideas about design consideration for persistent buildings. We transcribed each interview to text, and coded them by tagging common themes and terms throughout.

The corpus of *words* and *ideas*, combined with the graphic analysis of buildings described above, provides a rich set of empirical evidence for the present work and an invaluable resource for future investigations. For this project, the principles that emerged from this systematic process of annotation, analysis, and comparison were collected and codified into a theory of persistent architecture. We evaluated and refined this theory by testing its ability to describe and predict the attributes of our case-study buildings. Finally, because they are grounded in the words and buildings; our writing and exhibits can use them to illustrate and explicate the ideas they engendered.

RESEARCH DISSEMINATION

EXHIBITIONS

The Future-Use Architecture project resulted in two, distinct exhibitions, one of which has traveled to two locations to date, and the other will open in February of 2020.

PERSISTENT: EVOLVING ARCHITECTURE IN A CHANGING WORLD

- The show was initially curated and staged for the Architecture + Design Museum in the Art's District of Los Angeles, CA, from December 3-2018 to February 17, 2019.
- PERSISTENT served as the venue for the *Conference on Open Building*, sponsored by the Council on Open Building, the A+D Museum, and HED Architects, Los Angeles, and opened in conjunction with that conference.
- Steve Cimino wrote a positive review of the show, which appeared on the AIA homepage and generated considerable interest nationally for the exhibit travel to

other destinations. <https://www.aia.org/articles/6105841-for-future-use-architecture-the-time-is-now>

- PERSITENT then traveled to Kansas State University, College of Architecture, Planning and Design in Manhattan, KS. It opened on 8 April, with a public presentation of the Latrobe Prize work, and ran through the end of the semester.
- PERSISTENT will open at University of Massachusetts, Amherst in March, 2020.
- We continue to receive significant expressions of interest in the show traveling to other venues across the country and are working to secure additional funding and refine the artifacts to support showing in diverse venues without complete redesign.

DURABLE: SUSTAINABLE MATERIAL ECOLOGIES, ASSEMBLIES & CULTURES

- The Future-Use Architecture team was selected after an international competition to curate a new exhibition at the BSA Space, February-May 2020.
- As the title of this next exhibition suggests, it focuses on the life cycle implications of material and design decisions, making the argument for long-lasting buildings as the basis of architectural sustainability.
- The exhibition has strong educational ties, with a class of engineering students completing Life Cycle Assessment of precedent projects; an architectural communications course is developing exhibition design elements, and the comprehensive design studio will use the show in spring 2020 semester.
- The exhibit has garnered significant interest, and additional support.
- It is the goal of the BSA and the Future-Use Architecture team to have DURABLE travel after its Boston showing.

PRESENTATIONS

The Future-Use Architecture team has presented various aspects of our Latrobe Prize research in diverse venues, including the AIA Convention, academic conferences, Universities, and local professional events. The complete list of presentations is as follows:

- Common Ground, Northeastern University Boston, MA. Panel discussion with graduate students about research in architecture.
- 2018 AIA Convention, New York, NY: The team convened and moderated a panel with diverse perspectives around the topic of long-term change in building. Panelists included Michael Leblanc, AIA, a Principal at Utile; Ron McCoy, FAIA, the University Architect at Princeton University; and Elizabeth Minnis, AIA, the Deputy Commissioner for the Division of Capital Asset Management for the Commonwealth of Massachusetts.
- 2018 AIA Collaborative Research Summit, Minneapolis, MN: The team was invited to contribute the summit regarding priorities and approaches for research in professional practice. This included a presentation of the Latrobe work as well as participating in the *Method and Models of Practice* working group.
- 2018 AIA New England Design Awards Ceremony, BSA Space, Boston, MA: This invited Keynote focused on the main ideas that were emerging from the research,

- illustrated by salient quotes from the interviews, accompanied by exemplary and provocative projects, meant to inspire the audience to think about how to design architecture for persistence in conditions of constant change and uncertainty.
- 2018 Conference on Open Building, Architecture + Design Museum, Los Angeles, CA: Conference presentation on the similarities and differences between the tenets of the Council on Open Building as derived from the work of John Habraken and his followers and ideas of Future-Use Architecture as generated during the Latrobe Prize research and the many years of its pedagogy at the Northeastern University School of Architecture.
 - 2019 Kansas State University, College of Architecture, Planning and Design in Manhattan, KS: an invited lecture to an audience of students, faculty and professionals, jointly hosted by the College and the local AIA chapter, where we described the method of research through three examples of what constitutes Persistence in Architecture, and where we described the design of the exhibit.
 - 2019 AIA Convention, Las Vegas, NV: a 90-minute continuing education session with approximately 200 registered attendees, which explained the theoretical framework that emerged from the interviews and showed a precedent project for each of the thirteen themes.
 - 2019 Architecture Research Centers Consortium Conference, Toronto. Conference presentation to an international audience of architectural researchers which documented the research methods used in the Latrobe Project.
 - 2019 Building Technology Educator's Society (BTES) Conference Amherst, MA: Keynote Speakers: a 60-minute keynote speech for a national audience of scholars in building technology, which presented the value of our approach to the Grounded Theory Research method, and the theoretical framework for Future-Use Architecture with examples.
 - 2019 International Conference on Structures and Architecture, Lisbon, Portugal: Conference presentation to an audience of scholars and practitioners at the intersection of architecture and structural engineering, during a session on "Tectonic of architectural solutions", explaining the findings on one of the themes called "Grounding Buildings in Place," which will explain how the interaction of structural systems and the cultural, ecological and infrastructural conditions of a place enable adaptation to future change.
 - 2019 Reynolds Symposium: Education by Design. This upcoming presentation will describe cross-disciplinary curricula developed as part of the Latrobe Future Use Architecture research and curation process.

WRITING:

Scholarly writing necessarily lags scholarly research, however, during the grant period, the Future-Use Architecture team has published three peer-reviewed articles based on the work, with an additional two currently under review, and further writing in process. The written work to date also serves as the foundation of a scholarly book described below.

PEER REVIEWED ARTICLES

Laboy, Michelle; Fannon, David. "Creativity, Calculation, & Curation: Research as a Framework for Cross-Disciplinary Collaboration." In *Proceedings of the 2019 Reynolds Symposium*. Portland: University of Oregon. October 2019 (under review)

Laboy, Michelle. "Temporal Reciprocities of Building and Site: Structural Patterns for Resilient Future-Use Structures." In *Structures and Architecture: Proceedings of the Fourth International Conference on Structures and Architecture*. Leiden, The Netherlands: CRC Press/Balkema. July 2019 (under review)

Fannon, David; Laboy, Michelle. "Methods of Knowing: Grounded theory in the study of future-use architecture". In *Future Praxis: Applied Research as a Bridge Between Theory and Practice. Proceedings of the 2019 ARCC International Conference*. Toronto: Ryerson University. June 2019.

Wiederspahn, Peter. "Open Building and Future Use Architecture: A Comparative Analysis," In *Proceedings of the Open Building for Resilient Cities Conference*. Los Angeles: Architecture + Design Museum. December 2018

Fannon, David; Laboy, Michelle; Wiederspahn, Peter. "Dimensions of Use: From Determinism to a New Humanism." *Enquiry: The ARCC Journal of Architectural Research*, 15:1. November 2018.

BOOK MANUSCRIPT

We see the book as an opportunity to provide a comprehensive account of the project. The publisher Routledge expressed strong interest in our topic, and the team submitted a book proposal in August 2019. The subject editor found the proposal compelling, and sent it for external peer review, which is ongoing. The structure of the book offers a useful overview of the research findings and our emerging theory of persistence in architecture.

- 1 Introduction
 - 1.1 Motive
 - 1.2 Context
 - 1.3 Method
- 2 Architecture and Material Change
 - 2.1 Durability
 - 2.2 Simplicity
 - 2.3 Integrity
 - 2.4 Grounding in Place
- 3 Architecture and Human Use
 - 3.1 Humble
 - 3.2 Humane
 - 3.3 Beloved
 - 3.4 Challenging Programmatic Determinism
- 4 Architecture and the Future
 - 4.1 Anticipation

- 4.2 Timelessness
- 4.3 Complexity
- 4.4 Bridging Past and Future
- 5 Towards Persistent Design

TEACHING OUTCOMES

The Future-Use Architecture team has had significant interaction with students through the course of our research activities. In addition to the activities listed below, during the grant period, members of the team were invited as expert guest critics at Kansas State University, Boston Architectural College, Wentworth Institute of Technology, Harvard Graduate School of Design.

Student Research Experiences

Over two years, we created opportunities for a total of 13 graduate and undergraduate students to participate in our research activities. This includes 8 architecture graduate student research assistants, 4 architecture undergraduate student research assistants, and 1 engineering student researcher. These funded positions provided students with international-caliber research experience, new subject knowledge, and financial support.

ARCH 5120 Comprehensive Studio & ARCH 5220 Integrated Building Systems

Future-Use Architecture remains the organizing topic for the 5th year curriculum at Northeastern's School of Architecture through the concurrently taught and integrated Comprehensive Design Studio and Integrated Building Systems. The spring 2019 courses pilot tested new course materials developed through the Future-Use research. Future iterations of this integrated pedagogy are being re-assessed considering the research findings and will be redesigned for spring 2020 to take advantage of the in-depth case studies developed during the project. The curricular ideas were presented at the Building Technology Educators Society academic conference and are available for other institutions to implement.

CIVE 5275. Life Cycle Assessment of Materials, Products, and Infrastructure

In the spring 2019 semester a course in the College of Engineering—taught by our colleague, Professor Matthew Eckelman—used our research as the basis for the students' final projects focusing on life cycle assessment of five architectural precedents; one primarily constructed of wood, one of steel, one of masonry, one of concrete, and one a hybrid of construction systems. In addition to the ten students directly working on these projects, the entire class had the opportunity to learn about the environmental consequences of short- and long-lived buildings.

2019 Association of Collegiate Schools of Architecture (ACSA) Annual Conference

The Future-use proposed the topic of time in architecture, adopting the title *Being versus Becoming*, to interrogate architecture in a constant state of change. We were invited to chair two sessions on this topic at the conference, and our solicitation yielded approximately 20 submissions for peer review, from which we selected eight papers and projects, representing a range of scholarly work about time in architecture, and reflective scholarship

about it. The subjects ranged from the social aspects of community engagement, pedagogy, and the role of facilities staff, to technical aspects preservation, material specifications, and fabrication. At the conference, we moderated two rich discussions among scholars and teachers about ways the design process considers the passing of time.

ARCH 3450 Advanced Architectural Communication

In the Summer 2019, eight architecture students are using our upcoming exhibition DURABLE as a vehicle to develop methods for representing complex architectural data and exploring exhibition design within architecture. Taught by our colleague Chris Grimley of OverUnder, the course takes advantage of Boston's rich environment of exhibition, curation, and architectural discourse, as well as the unique opportunity to work in the BSA Space, and imagine curating cutting-edge research supported by the Latrobe Prize.

Integration

The Latrobe Project served to integrate the courses above, weaving a thread of long-lasting buildings across multiple courses, levels, and indeed colleges at Northeastern. One of the conference papers listed in the previous section reports the findings of these pedagogical experiments, which will also be presented to an audience of design educators in the Reynolds Symposium in October 2019. We hope this project will inspire other institutions to adopt future adaptability as an essential aspect of teaching architectural design, history, and building systems; and that our products will support that inquiry.

RESEARCH FINANCE

The financial support from the Latrobe Prize afforded the Future-Use Architecture team the time, ability to travel, and material resources to make this research project possible. The Team has also had great success multiplying this money with outside sources. Over two years attracting the following additional funding for our research and dissemination:

- A grant of \$20,000 from the Architecture + Design Museum in conjunction with the Council on Open Building to produce the PERSITENT exhibition in that space.
- A grant from the Flint Hills chapter of the AIA to support the PERSISTENT exhibit opening at Kansas State.
- A grant of \$50,000 from the BSA Foundation to curate and stage the DURABLE exhibition.
- In-kind donations of materials and services totaling approximately \$25,000 to date have been provided by manufacturers and fabricators for the DURABLE exhibit
- As noted in the proposal, we secured \$14,400 of fellowship funding for graduate student assistants, and a further \$12,000 in faculty travel support from the Northeastern University College of Arts, Media and Design.
- Our respective firms committed significant in-kind resources to the project beyond that detailed in the proposal.

We submitted competitive but unfortunately unsuccessful applications for additional grants totaling nearly \$100,000 by using the Latrobe as matching funds. We are actively pursuing additional support to continue the research and dissemination of the work.