FUTURE TRENDS REPORT

NCARB

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Note: The images in this report were created with the assistance of generative AI.

EXECUTIVE SUMMARY

About This Report

What will the future bring for architecture and regulation? From resource scarcity and the impact of the built environment on mental well-being, to the future of space architecture and Artificial Intelligence (AI), emerging trends and rapidly evolving technology provide both threats and opportunities to the architecture profession and the regulatory landscape.

The Futures Collaborative, a committee of dedicated National Council of Architectural Registration Boards (NCARB) volunteers, has identified five future-focused aspects of practice that will influence health, safety, and welfare in the built environment: AI, resource stewardship, space architecture, wellness, and the role of the architect. Read the full report to understand each theme's impact on architecture, as well as considerations and recommendations for architectural regulators.

About the Futures Collaborative

Established in 2017, the Futures Collaborative focuses on exploring future technological, societal, and architectural practice trends that could transform how NCARB and its members facilitate the licensing and credentialing of architects.

Members of the collaborative range from leading architects and experts in emerging technologies to architectural licensing board members who work collectively to identify and monitor

Future-Focused Themes

The Future of AI:
Is AI actively transforming the role of the architect?

The rise of generative design software, machine-learning-enhanced simulation platforms, and natural language processing assistants has introduced both unprecedented opportunities and new forms of uncertainty. As Artificial Intelligence (AI) systems increasingly inform design outcomes, architects are placed in the position of validating, endorsing, or relying upon the outputs of these tools. In response, regulators should take proactive action on the integration of AI in architectural practice.

The Future of Resource Stewardship:
How can architects adapt to increasing resource scarcity and volatility while advancing the long-term health and safety of the built environment?

The architecture and construction industry is rapidly approaching a materials crisis due to three key factors: scarcity, volatility, and environmental impact. With these factors raising costs and threatening to disrupt the industry, architects must explore lower-energy, renewable materials that are more locally accessible. Through educational resources, assessment tools, and policy adjustments, regulators have the opportunity to encourage a shift toward greater stewardship of the planet's limited resources—as well as public health.

The Future of Space Architecture:
What role can architects play in this unregulated domain, and how can space architecture inform HSW on Earth?

Space architecture is a growing industry with the potential to inform and disrupt current architectural practice. Its lack of potential changes in the regulatory environment and architectural practice.

Over the past several years, the Futures Collaborative conducted in-depth research into the trends and technologies shaping the evolution of practice, engaging with industry innovators and subject matter experts to gather a holistic understanding of the current and future practice of architecture. This report summarizes the key findings from their research—for a more thorough exploration of the trends highlighted in this report, be sure to check out the Future Collaborative's recommended Further Reading.

regulatory boundaries allows for rapid experimentation but may also lead to public safety risks that that could ultimately affect architectural practices on Earth if they remain unchecked. As humanity continues working toward inhabiting extraterrestrial environments, there should be significant research and testing to ensure public health, safety, and welfare outside of the current U.S. jurisdiction-bound system.

The Future of Wellness:
Do architects have a responsibility to influence mental well-being through the built environment?

Architects have a responsibility to protect the health, safety, and welfare (HSW) of the public. The inclusion of mental well-being within the definition of welfare has the potential to both add value to the role of the architect and to shape the regulatory environment. New technical advancements in neuroscience data collection and biometric analysis allow architects to study the effects of the built environment on public well-being. As these metrics advance, regulators increasingly have the ability to define well-being standards and incorporate measurable guidelines into building code.

The Future of the Architect:
How are changing systems and technologies transforming the role of the architect?

Changing systems within design and construction are reshaping the role of the architect. The current licensure system and its education, experience, and examination requirements may not be capable of sufficiently assessing practitioners' competency in the face of an evolving profession. By proactively adapting to this evolution of practice, introducing a more agile licensure system, and exploring and encouraging post-licensure specializations, architects and regulators can redefine how society perceives and engages with the profession, ultimately enhancing the value of the architect.

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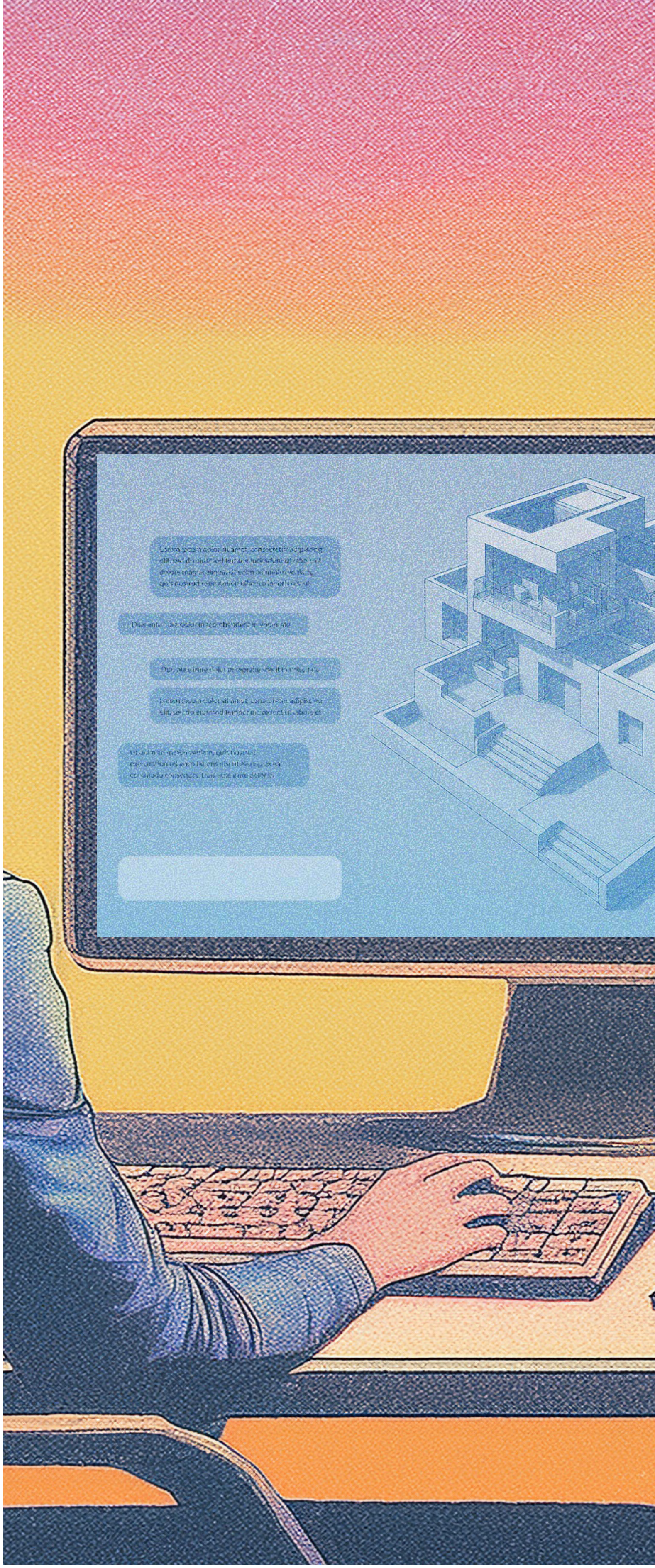
FUTURE-FOCUS THEME REPORTS

The Future of AI

Is AI actively transforming the role of the architect?

Carlos Augusto Garcia and Dena Prastos



Summary

Artificial intelligence (AI) is reshaping the architecture profession in real time, from how architects design and model to how they interpret building codes and engage with clients and communities. AI has already been integrated into platforms for space planning, zoning analysis, material optimization, and code compliance.

The rise of generative design software, machine-learning-enhanced simulation platforms, and natural language processing assistants has introduced both unprecedented opportunities and new forms of uncertainty—including critical questions about professional accountability, authorship, equity, and public trust. AI is transforming the role of the architect: As AI systems increasingly

inform or generate design outcomes, architects are placed in the position of validating, endorsing, or relying upon the outputs produced by these tools.

Further complicating this transformation is the fact that many architects do not fully understand or control the internal logic of the AI tools they use. AI's opacity directly challenges the architect's ethical and legal obligation to safeguard health, safety, and welfare. Without deliberate intervention, the profession may find itself governed by norms, tools, and ethical assumptions defined outside its own standards of care.

Key Insights

Key Insight #1

AI is redefining professional competency, but education and regulation have not kept pace.

The rapid adoption of AI-assisted design is reshaping the expectations of what it means to be competent, yet current licensure frameworks do not address this shift. While AI skill development might be best addressed at the academic level, architecture schools vary widely in how they teach AI, and AI literacy is not specifically listed as a competency required for licensure. If left unaddressed, this lag might erode preparedness across the profession.

Key Insight #2

The pace of technological change is outstripping the rhythm of regulation.

Many of the tools now entering practice were not anticipated when NCARB's *Competency Standard* was developed. Without a more nimble approach, regulation may remain reactive to public safety concerns—arriving only after harm is done or trust is compromised. However, premature regulation could create flawed assumptions or disadvantage smaller firms that are still adapting to these tools.

Key Insight #3

Architects remain fully accountable, even as AI tools increase opacity.

Regardless of disclaimers issued by software developers or the autonomy of machine-generated outputs, the architect of record is still bound by the standard of care. Architects' legal and ethical responsibilities are complicated by tools whose logic may be inaccessible, making it difficult to verify or interrogate results. Architects may be endorsing design decisions they do not fully control, which could fundamentally risk public health, safety, and welfare.

Key Insight #4

Bias in AI design workflows is an unregulated, present-day concern.

Current tools risk reinforcing patterns of inequity embedded in historical data sets, such as those related to land use, zoning, and housing algorithms. Architecture lacks a standard mechanism for bias auditing, unlike other sectors such as finance or healthcare. Practitioners are left without formal guidance on how to evaluate or mitigate harm, raising the possibility of regulatory blind spots around equity and justice.

To help address bias concerns, regulators and practitioners could develop tools, standards, and proactive ethical training that would allow practitioners to evaluate whether their AI tools may perpetuate systemic inequities.

Key Insight #5

Transparency is a prerequisite for trust—yet explainability is often absent.

The profession cannot meaningfully evaluate the use of AI if the underlying systems are not interpretable. Black box tools erode public trust, cloud professional accountability, and may produce results that *appear* authoritative but lack transparency. AI tools must support scrutiny, but it is unclear who bears the burden for conducting that scrutiny: the architect, the software vendor, or a third-party certifier.

While full explainability might be difficult to achieve given the complexity of deep learning systems, transparency protocols such as documentation requirements, disclosure of AI tool usage in design narratives, or "human-in-the-loop" verification procedures may provide more transparency into architectural oversight.

What Regulators Need to Do Now

The integration of artificial intelligence into architectural workflows challenges foundational assumptions embedded in the regulatory frameworks that govern licensure, competency, and professional accountability. Regulators must take proactive action on the integration of artificial intelligence in architectural practice. For example:

1. Maintain awareness of AI tools and usage

Individuals who play a role in professional regulation must take steps to stay informed and aware of emerging trends and technologies related to AI usage, including skills required to use these tools, potential risks, and frameworks for responsible use.

2. Share best practices regarding ethical use, bias mitigation, and transparency

As architects and regulators become more familiar with the internal logic and potential biases of AI tools, they must share insights and best practices into how to best maintain responsibility over automated outputs, how to evaluate and address bias in AI-generated designs, and how to disclose the use of AI in the design process.

Future Discussion Points

- What constitutes a reasonable standard of care for architects using AI tools?
- How does AI impact architects in the present, as well as in the future?
- How can architects ethically and responsibly vet and disclose the use of AI during the project documentation and permitting process?
- What level of competence in using, interpreting, and ethically applying AI should be expected for architectural licensure?

3. Consider what level of AI literacy should be required

AI literacy is not currently a licensure requirement—but as the individuals responsible for setting licensure requirements in their jurisdictions, architectural regulators must consider whether AI literacy (including ethical judgment, understanding of liability, and system control) should be an assessable competency for licensure.

4. Advocate for transparency in AI

Architectural regulators must advocate for transparency and explainability standards in tools marketed to architects. Through outreach to legislators and other stakeholders, regulators can promote the development of "white box" systems that enable process auditing and maintain professional accountability.

The Future of Resource Stewardship

How can architects adapt to increasing resource scarcity and volatility while advancing the long-term health and safety of the built environment?

Wyly Brown and Scott E. Cornelius

Summary

The architecture industry in the United States is rapidly approaching a materials crisis due to three key factors: scarcity, volatility, and environmental impact. Many conventional building materials rely heavily on non-renewable resources like sand and petroleum, while others are routinely impacted by unstable supply chains and geopolitical conflict. And, as research increasingly demonstrates the negative environmental and health impact

of fossil fuels and microplastics, building materials that are currently considered alternative, experimental, or innovative might soon become mainstream choices.

With factors like material shortages and tariffs raising costs and threatening to disrupt the industry, architects must explore lower-energy, renewable materials that are more locally accessible. Future architects will also have a higher standard of care in understanding the impact of the material choices they specify within their designs. Through educational resources, assessment tools, and policy adjustments, regulators have the opportunity to encourage a shift toward greater stewardship of the planet's limited resources—as well as public health.

Key Insights

Key Insight #1

Many key building materials are facing scarcity and supply chain volatility that could transform the architecture industry.

Many current conventional building materials and energy resources are non-renewable and facing increasing scarcity, compounded by complex global supply chains.

- **Petroleum-based materials** (PVC, asphalt, membranes) are the most time-limited (~50 years).
- **Materials from renewable sources** (wood, engineered wood) vary in sustainability based on the type of wood. Hardwoods are a very time-limited resource; however, softwoods could be available for centuries if management methods are modified to be more sustainable.
- **Recyclable materials** (steel, aluminum, copper) could last much longer with closed-loop systems; however, current sourcing methods of these materials present many ethical and social concerns.
- **Materials like stone and clay** are widely available but limited by environmental and mining concerns. If locally sourced, stone can be a sustainable choice due to its low carbon footprint, and clay is a great alternative building material if low-fired and regionally sourced.

The following table provides an estimate of future material availability based on current availability and rates of consumption.*

Material	**Estimated Years Left**	**Notes**
Tropical Hardwood (Mahogany, Teak, Rosewood, etc.)	20–50 years	Highly endangered due to illegal logging, poor regulation, and deforestation. Many species are already critically depleted.
Copper	40–70 years	Scarce, though recycling is common.
Asphalt Shingles (Petroleum)	50 years	Tied to crude oil availability.
Roof Membranes (EPDM, TPO)	50 years	Derived from fossil fuels.
Concrete (Cement, Sand, Limestone)	50–100 years	Sand shortages already impacting global supply.
Insulation (Fiberglass, Foam)	50–100 years	Petroleum-based foam may be constrained.
PVC (Plastics, Petrochemicals)	50–100 years	Heavily oil-dependent, but recyclable in theory.
Adhesives & Sealants	50–100 years	Often petroleum-based or synthetic resins.
Paint & Coatings	50–100 years	Relies on petrochemicals and heavy metals.
Aluminum (Bauxite)	80–100 years	Recycling significantly extends usable lifespan.
Brick (Clay, Shale)	100+ years	Materials are abundant, but energy-intensive.
Glass (Silica Sand)	100+ years	High-quality silica sand is becoming scarce.
Ceramic Tile (Clay, Feldspar)	100+ years	Materials are widely available.
Drywall (Gypsum)	100–150 years	Gypsum is plentiful in the U.S. and Canada.
Steel (Iron Ore)	100–200 years	Highly recyclable, especially in construction.
Wood (Lumber, Timber)	100–200 years	Depends on deforestation vs. replanting.
Plywood	100–200 years	Timber source-dependent; can be sustainable.
OSB (Oriented Strand Board)	100–200 years	Uses smaller, fast-growing trees.
Engineered Wood (LVL, Glulam)	100–200 years	Based on timber; sustainability matters.
Rebar (Steel)	100–200 years	Same as steel; heavily reused in scrap markets.
Softwood (Pine, Fir, Spruce, etc.)	100–200+ years	Widely managed through replanting and sustainable forestry. Lifespan depends on continued responsible forest management and fire/pest control.
Stone (Natural, Engineered)	1,000+ years	Effectively inexhaustible, though quarrying has limits.

**References for this table are provided at the end of this section.*

Key Insight #2

Many conventional building material choices have a negative impact on health, safety, and welfare in the long-term.

Through scientific research and studies, architects will need to be more aware than ever of the negative impact that the embodied energy of new construction has on carbon emissions—and thus climate change—as well as of the impact that microplastics, volatile organic compounds (VOC), and particulates from synthetic materials have on human health. Maintaining the current status quo of resource selection will have lasting negative impacts both on Earth's environment and those who live within it.

Key Insight #3

Architects must explore alternative building materials and building practices.

It is critical that architects experiment with, identify, and refine constructing with alternative materials and building practices such as using natural fibers and increasing material recycling. By understanding the capabilities and impact of new building materials, architects can help inform new practice standards before the industry reaches a crisis.

Key Insight #4

To be at the forefront of innovative building materials, architects require tools and resources to help them better understand the current material landscape.

While information and resources are available to assist architects in making informed material choices, architects lack holistic material education, systems for implementing material re-use at large, and a quantitative measurement system for assessing the most appropriate material choice in a given situation.

What Regulators Need to Do Now

Both interest in and need for pursuing alternative building materials is on the rise—and it is up to architectural regulators to keep pace with this change and not hamper progress. By investing in the code and legislative support needed to challenge current conventional building practices, architectural regulators can further their mission to protect the health, safety, and welfare of the public, now and in the future. To ensure good stewardship of the Earth's limited resources, regulators must:

1. Understand the impact that policies and regulation have on material usage.

The regulatory community should conduct holistic research into current U.S. standards regarding appropriate building materials, recycling practices, and material sourcing. By better understanding the current policy and regulatory landscape, architectural regulators can guide informed discussion and adoption of standards that allow for evolution in practice or incentivize alternative or innovative approaches.

2. Expand educational resources that demonstrate the HSW impact of material choices.

By ensuring that architects have access to and incentive to complete quality continuing education materials related to understanding the health and welfare impact of material choices, global supply chain, resource scarcity, and innovative material approaches, architectural regulators can ensure that practitioners are prepared to navigate the evolving resource landscape.

Future Discussion Points

- What materials are most impacted by scarcity and climate change, and how much flexibility does the building industry currently have to adjust to that scarcity?
- What factors are limiting architects' ability to pursue alternative or innovative material usage?
- Are there ways regulators can encourage or promote awareness of where materials come from and their financial, environmental, and human impact?
- How can regulators support more agility within codes and standards to allow for new materials or direct decisions toward more ethical/sustainable materials?

Additionally, regulators may consider expanding licensure requirements related to material usage and assessment to ensure that future practitioners have developed the necessary competencies to practice safely and sustainably.

3. Consider a system to help architects evaluate the impact of building materials within projects and the industry at large.

As technology advances and more data regarding buildings' long-term impact becomes readily available, regulators have the opportunity to help architects make objective, informed decisions regarding material usage by creating or advocating for a quantitative measuring system to measure both the immediate and long-term implications of resource decisions—for example, creating a product grading system based on a material's potential health, environmental, and social impacts. The European Union is already experimenting with Digital Product Passports that provide transparency on products' origins and value chains. Once implemented, this system could inform future regulatory or building code standards.

Future Material Availability References

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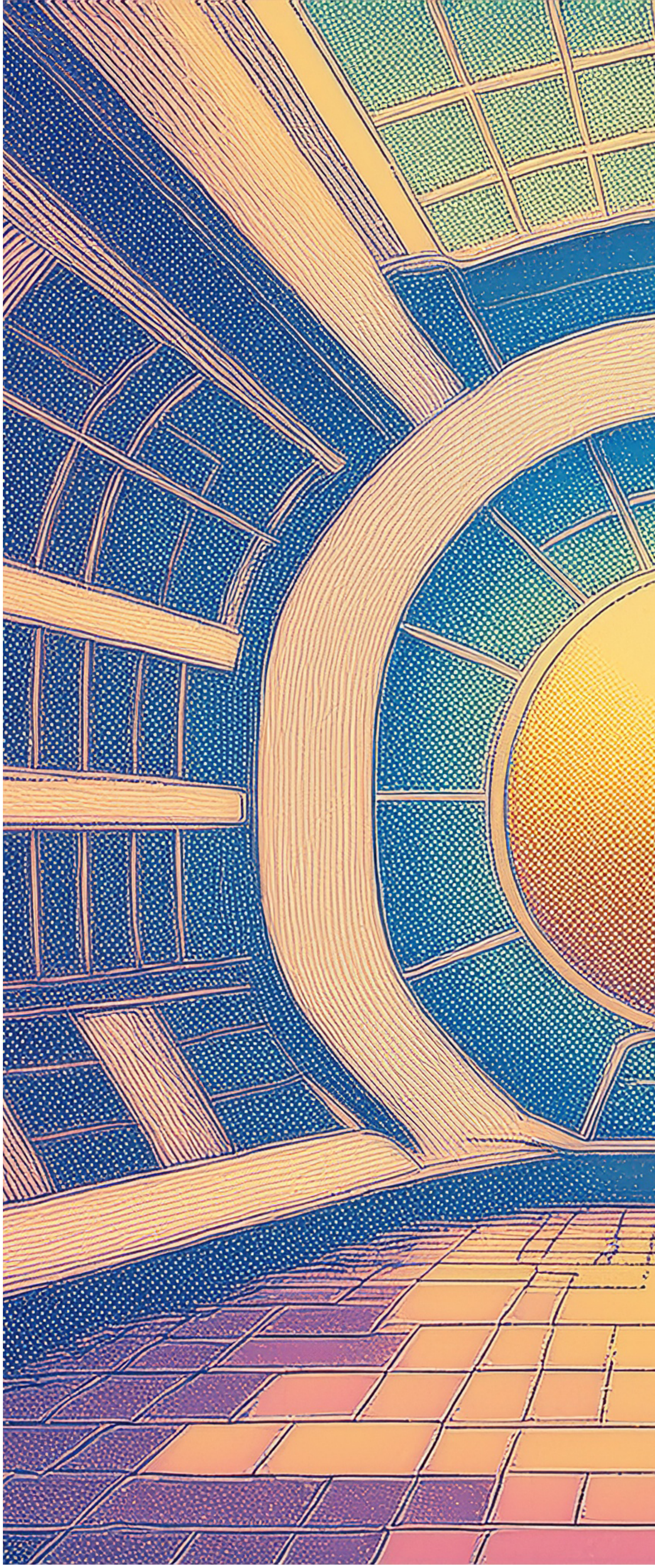
The Future of Space Architecture

What role can architects play in this unregulated domain, and how can space architecture inform HSW on Earth?

Alastair Stokes and Jon Wilbeck



Summary

Outer space is no longer just a site for exploration—it is a proving ground for technological developments and the source of an emerging economy in raw materials extraction, tourism, and off-world living. The pace of development is rapid, and there are significant opportunities for development in the fields of human well-being and materials science. Together, these advancements have the potential for revolutionizing not just habitats in outer space but also architecture on Earth.

With fast-paced research and development comes increased opportunities for failure. The immense challenges of sustaining humans in space pose significant compromises to health, safety, and welfare, with few systems in place to enforce boundaries and limited regulations in place to safeguard those who work on and live in off-earth habitats.

Because licensing boards are limited to regulating practice within the borders of their jurisdiction, there is currently little cause or scope for architectural regulators to have any direct role in the regulation of space architecture.

Key Insights

Key Insight #1

Research on space architecture may help advance health, safety, and welfare goals on Earth, especially in relation to extreme environments.

Though it is not yet clear what the outcomes might be, the study of human well-being in space—including understanding and mitigating the impact of astronauts' physical environment on their long-term psychology and physiology—will likely shape professional understanding of what is possible, or even recommended, on Earth. Additionally, research on the technological aspects of survival in space will likely affect how architects design for other extreme environments, a feedback loop that is becoming more relevant due to the increasing prevalence of climate-related disasters and extreme weather events.

Key Insight #2

Currently, the regulatory framework for the human inhabitation of space (i.e., "space architecture") is wholly independent from architectural regulation.

While the practice of architecture is regulated at the jurisdictional level in the United States, with each jurisdiction establishing building codes, requirements to practice, and enforcement policies, the practice of space architecture is not regulated by any one authority. Space exploration and space inhabitation are treated as a singular field, governed by both military and civil organizations, as well as various historical treaties between countries.

Because licensing boards are limited to regulating practice within the borders of their jurisdiction, there is currently little cause or scope for architectural regulators to have any direct role in the regulation of space architecture.

Key Insight #3

Architects are already involved in space architecture, but the need for a license is unclear.

Organizations and companies such as NASA, Boeing, and SpaceX already employ architects to help develop and design space habitats—these individuals often refer to themselves as "space architects." While many space architects hold a license to practice, "space architect" is not a protected title at the jurisdictional level. As a result, individuals referring to themselves as space architects are not required to have demonstrated the level of competent practice needed to protect the health, safety, and welfare of the public in a terrestrial setting. This could lead to varying levels of qualifications within the field, resulting in potential consumer confusion and safety concerns.

Key Insight #4

Architects interested in the field of space architecture may need to pursue additional education in engineering.

While many architects are already involved in the field of space architecture, the current integration of space architecture with aerospace engineering necessitates additional training in engineering beyond what an individual might learn in a traditional architectural education. The prerequisites for joining the main U.S. professional organization associated with space architecture (the American Institute of Aeronautics and Astronautics, or AIAA) highlight this need for engineering training: AIAA membership requires a degree in engineering but does not require a degree in architecture.

What Regulators Need to Do Now

Space architecture is a growing industry with the potential to inform and disrupt current architectural practice. Its lack of regulatory boundaries allows for rapid experimentation but may also lead to public safety risks that could ultimately affect architectural practices on Earth if they remain unchecked. To stay at the forefront of developments in space architecture and protect the public both on and outside of our planet, regulators must:

1. Create feedback loops between traditional architecture and space architecture

Architectural regulators have the opportunity to share best practices regarding public health, safety, and welfare with professionals leading the development of space architecture. Conversely, they also have the opportunity to learn from the research and experiments driving the evolution of space architecture, particularly related to factors influencing well-being. By developing a feedback loop between these industries, regulators can facilitate the sharing of knowledge and best practices between professionals involved in designing both terrestrial and extraterrestrial habitats.

2. Advocate for the role of architects in space architectural regulation

Given the scope and complexity of the current organizational landscape involved in space architecture, architectural regulators are unlikely to have any jurisdiction over space architecture in the future—but they may be able to contribute as subject matter experts who can help shape the development of guidance and best practices for space regulation. Additionally, architectural regulators may wish to emphasize the importance of including both

Future Discussion Points

- What role should regulation play in safeguarding the HSW of the public in space habitats?
- What role should architects play in designing space habitats?
- How could advancements in space architecture lead to advancements in architecture on Earth?

architects *and* engineers in the development of extraterrestrial habitats, ensuring that architects are not excluded from this industry in the future.

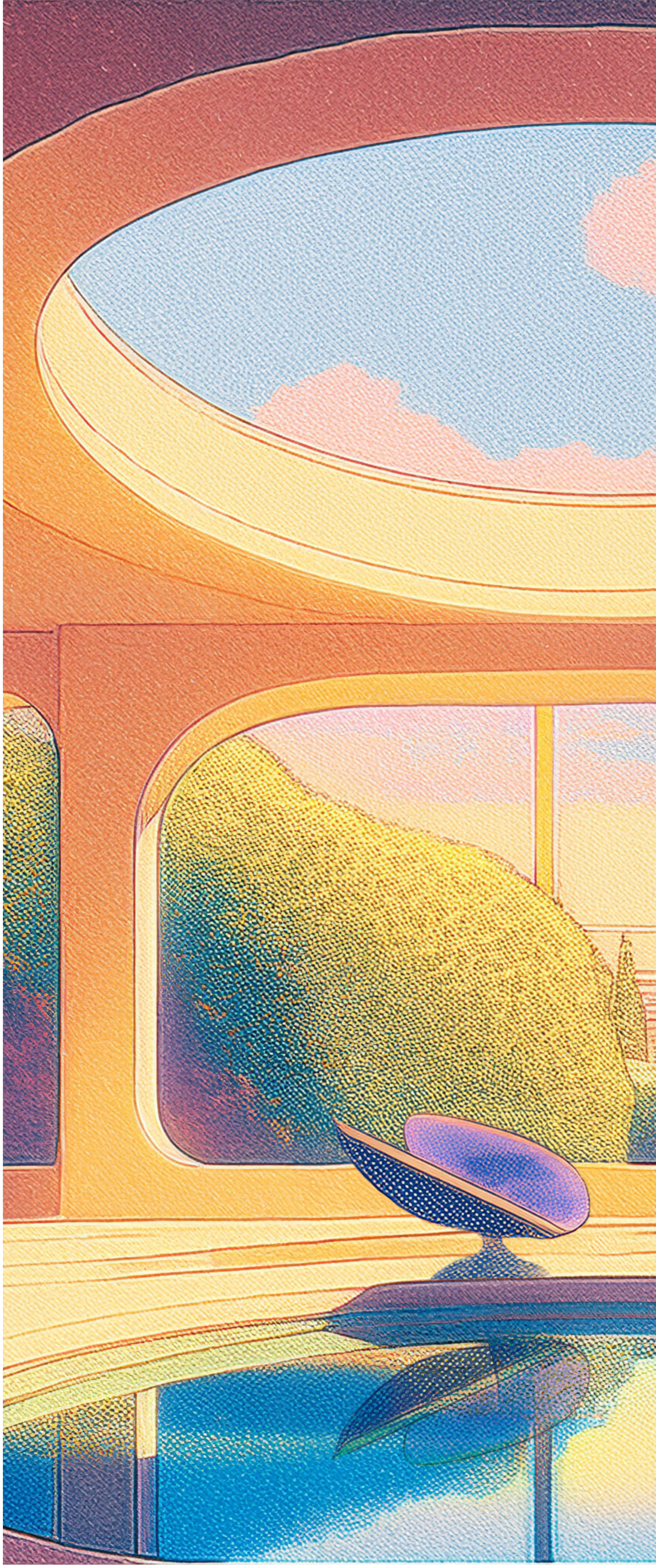
3. Ensure architectural education provides opportunities for students interested in space architecture

Ensuring that future architects are qualified to work in the field of space architecture may require developing opportunities to focus on space engineering within architectural education and training. Architectural regulators and those involved in establishing architectural curricula should consider the possibility of creating “tracks” for students interested in space architecture, as well as opportunities to allow experience related to space architecture to count toward licensure requirements.

The Future of Wellness

Do architects have a responsibility to influence mental well-being through the built environment?

Marjorie Brown and Jenarmi Contreras Luna



Summary

Architects have a responsibility to protect the health, safety, and welfare (HSW) of the public. The inclusion of mental well-being within the definition of welfare has the potential to both add value to the role of the architect and shape the regulatory environment within the field of architecture.

In response to a growing mental health crisis, the U.S. Surgeon General redefined physical ***welfare*** to include ***mental well-being*** in 2023. Other organizations—including the World Health Organization (WHO), the International Well Being Institute IWBI), and Fitwel—have also expanded their definitions to include

mental well-being as a determinant of public health. In 2024, one in every five adults reported having a mental health condition.

While design alone may not be able to resolve this mental health crisis, new technical advancements in neuroscience data collection and biometric analysis allow architects to study the effects of the built environment on public well-being. This data can lead architects to make more informed design decisions and produce buildings that promote positive well-being outcomes.

By incorporating protection of mental well-being into the definition of welfare, the industry has the potential to add new value and meaning to the role of the architect. As metrics regarding well-being advance, regulators increasingly have the ability to define well-being standards and incorporate measurable guidelines into building code.

Key Insights

Key Insight #1

There is a direct correlation between health, well-being, and the built environment.

Studies show that certain factors in the built environment—such as limited access to daylight, quality light, and unnatural patterns—can trigger neurophysiological stress. Chronic exposure to these stressors can affect neuroplasticity, memory, emotional regulation, and mental health, as well as issues related to immune function and inflammation. By designing spaces centered on healing, architects can provide sensory support to optimize well-being and the related cognitive responses.

Key Insight #2

While architects play a significant role in promoting public well-being, architectural regulation has historically focused on physical welfare.

NCARB's mission, and that of many licensing boards, centers around protecting the public health, safety, and welfare. To ensure fairness and validity, architectural licensure programs typically focus on measurable, objective areas of knowledge, skill, ability, and behavior related to HSW.

NCARB is beginning to incorporate aspects of well-being into its definition of welfare. NCARB's *2022 Analysis of Practice* identified the following attributes as related to welfare: accessibility and universal design, indoor air quality, code compliance, sense of safety and security, and access to sunlight.

However, more could be done to align the competencies required for licensure with the level of well-being defined by **the National Institute of Health**: "an active process of becoming aware of, and making choices toward, a healthy and fulfilling life."

Key Insight #3

Increased interest in the field of neuroarchitecture is posing fundamental questions regarding an architect's ethical responsibility to design environments that support psychological well-being.

Neuroscience & Neuroarchitecture is an interdisciplinary field that explores how the built environment affects human brain function, behavior, cognition, and psychological well-being. Evidence-based design assessment techniques use factors like heart rate variability and brain activity to measure how successfully a design promotes well-being

Key Insight #4

The health industry offers a variety of metrics that can be used to evaluate and regulate well-being-focused design in the built environment.

These metrics include biometric testing of allostatic overload, biophobic testing, comfort performance testing, and more. Through the use of wearable fitness trackers; air, sound, and water quality management systems; community engagement opportunities; and other clinical mental and physical well-being assessments, architects can better evaluate the impact of their design and begin to establish standards for future regulation.

Several organizations are already beginning to explore measurable future building standards, including the IWBI WELL building standard (focused on the built environment's impact on human health) and Fitwel (focused on a building's enhancements to support the well-being of its occupants and foster healthier communities).

> "Incorporating specialized clinical advisory committees into the building regulatory processes is a way to inform codes, guidelines, and design practices.
>
> – Cleo Valentine, *Rethinking Architecture and Ethics in the Age of Neuroscience*

Key Insight #5

Many of the metrics used to assess the built environment's impact on well-being are still considered subjective.

It can be difficult to measure well-being in the built environment because it is widely considered a uniquely individual aspect of human life—and therefore, to some extent, subjective. Neuroscientists are attempting to instill greater objectivity through biometric tests (such as those noted above) that produce reliable metric ranges. Despite this sense of subjectivity, the built environment's large-scale impact on human well-being raises the potential for neuropsychological studies to be considered when regulating architectural practice; similarly, cognitive data could be integrated as part of project design goals.

What Regulators Need to Do Now

New technology is making it possible to measure positive and negative well-being performance outcomes within various built environments. These studies will inform architects' design decisions and may expand into architectural curriculum, licensure competencies, and regulatory guidelines. Regulators must stay at the forefront of industry trends related to well-being by:

1. Reviewing jurisdictional definitions of well-being

Typically, "health, safety, and welfare" are defined at the jurisdictional level, with a scope that extends across all licensed/regulated professions. Architectural regulators may wish to advocate for a transition from "welfare" to "well-being," but must become familiar with their jurisdictional legislative landscape in order to proceed.

2. Explore research related to the impact of the built environment on public well-being

Individuals who play a role in professional regulation must work to ensure they understand the latest trends, technologies, and assessments defining the impact of architecture on public well-being. By doing so, they can be better prepared to make informed decisions regarding the regulation of the profession in the future.

3. Consider incorporating well-being-focused skills into licensure competencies

Skills related to well-being-focused design are not explicitly required for licensure—but as the individuals responsible for setting licensure requirements in their jurisdictions, architectural regulators must consider whether the ability to design, implement, and evaluate for positive mental wellness is assessable for licensure.**4. Advocate for well-being in building codes**

As with other health and safety standards in the built environment, the future of well-being standards will be incorporated into local building codes. By partnering with building code officials to advocate for the establishment of those standards, architectural regulators can ensure that practitioners have a voice in determining industry-wide requirements.

Future Discussion Points

- What key well-being attributes should architects focus on?
- What are other organizations/professions doing to update their definition of welfare/well-being? To measure well-being in practice?
- How can well-being metrics lead to greater equity in the built environment?

The Future of the Architect

How are changing systems and technologies transforming the role of the architect?

Maria Antony Katticaran and Walton Teague

Summary

The architectural profession stands at a pivotal crossroads. As factors like technological disruption, climate crises, and evolving project delivery models reshape every dimension of practice, architects face the opportunity to demonstrate their unique value in protecting the public's health, safety, and welfare—or risk becoming obsolete.

Changing systems within design and construction are reshaping the role of the architect. The current licensure system and

its blend of education, experience, and examination requirements may not be capable of staying apace with an evolving profession.

By proactively adapting to this evolution of practice, developing a more agile licensure system, and exploring and encouraging post-licensure specializations, architects and regulators can redefine how society perceives and engages with the profession, ultimately enhancing the value of the architect.

Key Insights

Key Insight #1

New technology and delivery systems pose both threats and opportunities for the role of the architect.

A range of external forces and trends are impacting the practice of architecture, including automation, prefabrication, changing funding models, design-build delivery systems, sustainability, and collaboration with other industry partners. If architects are able to adapt and lead these changes, this will strengthen the architect's role and enhance their public value.

Key Insight #2

Technology cannot fully replace the skill of the architect in creating human-centered design.

Architects are uniquely equipped to balance form, function, and the human experience. In a future shaped by artificial intelligence and automation, it is the human lens provided by the architect that ensures design outcomes remain just, inclusive, and empathetic. The rise of advanced technology creates an opportunity for architects and regulators to demonstrate the value of human-centered design to society.

Key Insight #3

In order to maintain the value of the architect in a rapidly evolving profession, the licensure process must become more flexible while retaining the necessary rigor for effective competency assessment.

The speed, scale, and complexity of the evolution of practice may begin to outpace the agility of the current licensure framework, as new project delivery methods, materials, and technologies expand the need for some skills while diminishing others. Introducing a more flexible, adaptable process that can quickly accommodate changes in necessary knowledge, skills, and abilities is essential to ensure the continued protection of the public.

Key Insight #4

Post-licensure specializations may elevate architects' relevance and public recognition.

While specialization already exists within many areas of architecture practice (for example, sustainability, safety, accessibility, and digital fabrication), there is no regulated process for formal recognition or credentialing at the regulatory level. Formalizing specializations in the future may preserve relevance and protect public interests in complex domains, providing opportunities to further demonstrate architects' skill and necessity.

What Regulators Need to Do Now

As the profession evolves at an increasingly rapid pace, regulators must stay apace with this transformation. Ensuring that regulation appropriately responds to trends in practice and responds to changing health, safety, and welfare expectations will require proactive, rather than reactive, consideration. To carry out their HSW mission in the face of a changing profession, regulators should:

1. Continue to study how changing systems and technology are shaping the role of the architect.

Regulators cannot respond to new systems and technology if they do not remain informed and engaged in the industry's evolution. By maintaining awareness of and experience with emerging trends in the profession, regulators can ensure they are prepared to respond quickly and effectively to the evolving needs of the public. NCARB has a direct role in leading the preparation for this evolution.

2. Evolve the licensure process to recognize emerging skills and competencies that have a positive influence on the health, safety, and welfare of the public.

As new technologies develop and shape the practice of architecture, the licensure process will need to monitor the types of education and range of competencies required to maintain the health, safety, and welfare of the public. Regulators must be willing to evolve not only the competencies required for licensure, but also the methods used to demonstrate and assess them in order to keep pace with the rate of change.

3. Explore potential frameworks for post-licensure specializations.

To better understand if and how post-licensure specializations should be introduced at the regulatory level, regulators should conduct deeper research into the current usage of specializations within the architecture profession—including their value to practitioners, and health, safety, and welfare impact. Results of this exploration can help inform the development and administration of potential future specialization competency standards.

Future Discussion Points

- What role will architects play 30 to 50 years from now? What would the licensing system that supports this future state look like?
- What areas of practice related to HSW are evolving the most quickly? How can licensure competencies keep pace with this evolution?
- What role, if any, should NCARB play in exploring post-licensure specializations?

FURTHER READING

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