College of Design, Construction and Planning

UF DCP Research Agenda-Setting White Paper

Towards the Provision of Safe, Decent, and Affordable Housing in the State of Florida

Executive Summary:

The state of Florida is facing mounting affordable housing challenges, with more than half of the state's renters and a quarter of homeowners spending more than 30% of their income on housing. This issue is exacerbated by the state's rapid population growth and the recent impact of multiple hurricanes and tropical storms. Affordable housing is a foundation for wellbeing, and the consequences of the affordable housing shortage can include diminished safety, health, and access to opportunity for Florida's residents.

Since housing touches on many facets of social, environmental, and economic issues, there is no single solution to the issue of affordable housing. Housing is an intrinsically multidisciplinary topic that requires coordination across architecture, engineering, urban planning, public policy, geography, economics, public health, and sustainability sciences. This research group aims to bring together diverse expertise and approaches to provide safe, decent, and affordable housing for all.

The group is building on existing research, data, and collaborations, including the Florida Housing Research Group, the Shimberg Center for Housing Studies, and housing experts across DCP. The team has established connections with housing practitioners and nonprofits, providing partnerships for housing-related research and practical impact. This white paper has two primary objectives: 1) To highlight examples of innovative housing research ongoing in DCP; and 2) To outline opportunities for future housing-related research, practice, and education within DCP to expand on existing strengths.

WG Members:

	Name	Affiliation	Academia/ Industry/ Government
Lead	Maria Watson	University of Florida	Academia
Other members	Aladdin Alwisy	University of Florida	Academia
	Stephen Bender	University of Florida	Academia
	Cleary Larkin	University of Florida	Academia
	Patricia Kio	University of Florida	Academia
	Jason Von Meding	University of Florida	Academia
	Bill O'Dell	University of Florida	Academia
	Anne Ray	University of Florida	Academia
	Ryan Sharston	University of Florida	Academia
	Renee Tapp	University of Florida	Academia
	Emre Tepe	University of Florida	Academia

Description of the Problem, Key Research Areas / Priorities and Research Questions:

Current AI generative design tools in architecture and engineering often prioritize image synthesis or entire-model generation, offering limited opportunities for iterative refinement or semantic control over model components. These tools frequently overlook structural validity and user-specific qualitative feedback in early design stages.

Housing is becoming increasingly unaffordable and unobtainable in the state of Florida. Nearly 3.4 million (41%) households in Florida pay more than 30 percent of their income

for housing, the standard measure of housing affordability. This includes more than half of the state's renters– which is the highest share of any state in the U.S.–and a quarter of homeowners, according to the 2023 American Community Survey. Though the lack of affordable housing is a national issue, Florida has several factors that have exacerbated housing needs in the state. For one, Florida was one of the fastest-growing states in the country following the pandemic, with a 5.1% increase in population since the 2020 U.S. Census. Secondly, Florida has experienced ten hurricanes and tropical storms during the same time period, including Hurricane Ian, which was the third-costliest hurricane to impact the United States. Florida's need for affordable housing–as well as sustainable and resilient housing–invites our collective efforts.

The human consequences of the affordable housing shortage can include diminished safety, health, and access to opportunity. As residents pay more for housing, less is available for food, healthcare, and other basic necessities, contributing to the importance of housing as a social determinant of health. The quality of affordable housing can affect exposure to lead, pollutants, and other harms. The location of affordable housing can affect the availability of food, educational opportunities, access to green space, and other benefits. Affordable housing is a foundation for wellbeing, equity, and the quality of our communities. Since housing touches on many facets of social, environmental, and economic issues, there is no single solution to the issue of affordable housing. Housing is an intrinsically multidisciplinary topic that requires coordination across disciplines, including:

- Architecture, engineering and construction, including the use of building codes, and delivery systems for lower-cost, high-quality home design and production.
- Urban and regional planning, including zoning, transportation, local land use controls, and historic preservation that shape the availability and diversity of housing options.
- Public policy, including housing vouchers, public provision of housing, and regulatory approaches to help subsidize or control housing costs and prevent homelessness.
- Geography, including understanding differences in opportunity, climate exposure and disaster risk, and housing access across race, income, and other socio-demographic groups.

- Economics, including the role of affordable housing in supporting the workforce and local and state economic development
- Public health, including the role housing plays as a key social determinant of health and the negative effect of housing instability on physical and mental health.
- Sustainability, including the role of circular economies, innovative materials, and construction techniques to increase housing supply without adverse environmental and climate impacts.

This research group aims to bring together the diversity of expertise and range of approaches across DCP and the state of Florida needed to provide safe, decent, and affordable housing for all. DCP is uniquely poised to be an effective leader in this research area due to the existing expertise in these areas and the potential for new research collaborations moving forward.

This white paper initiative expands existing research, data, and an on-going collaborative effort, the Florida Housing Research Group, which is a cross-disciplinary network that brings together Florida housing researchers to learn about each other's work and encourage collaboration across institutions. The group has met bimonthly for the last several years to discuss emerging topics across the state and beyond. This has included *updates to housing legislation and regulations*; this year has seen presentations on the Live Local Act and laws regarding condominium associations and a discussion on research opportunities surrounding these policies. It has also included presentations on *emerging housing trends and research findings*, such as rent savings in low-income housing tax credit properties, climate gentrification in Miami, rental market changes after Hurricane Irma, and others.

From a data perspective, DCP houses the Shimberg Center for Housing Studies, which maintains the Florida Housing Data Clearinghouse. The Shimberg Center was established by the Florida Legislature in 1988 as a research hub to facilitate the provision of safe, decent, and affordable housing and related community development. The Center conducts research into housing policy and planning, with a special focus on housing affordability for Florida residents. Since 2000, the Center has produced the Florida Housing Data Clearinghouse[1] to provide housing supply and demand data for Florida's cities and counties and can be leveraged to support housing research.

Lastly, the team has broadly maintained and established connections with housing practitioners and nonprofits–such as advocacy organizations, housing and community development lenders, legal service organizations, and technical assistance providers, providing partnerships for housing-related research and a high potential for practical impact.

Building on these efforts, this white paper has two primary objectives:

1) To highlight examples of innovative housing research ongoing in DCP; and
2) To outline opportunities for future housing-related research, practice, and education within DCP to expand on existing strengths.

Solutions and Methodological Considerations

This section highlights examples of ongoing projects within the college with relevance or potential applications to housing. This list is not comprehensive, but is meant to be illustrative of the diversity of approaches and expertise in DCP faculty in addressing the issue of safe, decent, and affordable housing. As applicable, research needs and next steps are highlighted.

Health, Housing, and Justice – Discriminatory housing practices and segregation have had lasting impacts on infrastructure, health, and energy burden across neighborhoods. Elevating the voices and needs of these communities is critical in seeking local and justice-oriented solutions. Research led by Dr. Von Meding centers on the perspectives of racialized groups historically excluded from shaping policies around space, resources, and development in Jacksonville's historically Black neighborhoods. This effort, funded by Florida Sea Grant, included a focus on community health, in particular indoor air quality, energy burden and affordability, and housing quality on respiratory risk.

Wealth Building through Homeownership - Homeownership is an important way American families to accumulate wealth, as their homes are often their most significant asset. Though many states provide generous homestead protections by law to preserve this wealth, some homeowners are vulnerable to losing their homes through various legal procedures, including forced sales of property for tax delinquency; foreclosure for building code violations, and loss of inherited homes ("heirs' property"). Often, this home loss disproportionately affects the most vulnerable residents, including seniors, individuals with disabilities, LGBTQ2+ individuals and families, recent immigrants, veterans, and racial and ethnic minorities. Working with Local Initiative Support Corporation (LISC) in Jacksonville legal service organizations, and other partners, this

proposed project led by Dr. Emre Tepe explores the impact of these policies on wealth-building in LISC's core neighborhoods and identifies interventions. To conduct this research project, the team is required to obtain and collect extensive data in neighborhoods in Florida and analyze the acquired data extensively in collaboration with experts from law and the Center for Governmental Responsibility (CGR), statistics, and affordable housing. This research will initiate new projects to identify best practices to protect homeownership in Florida and build assessment tools to identify households at risk of losing their homes.

Affordable Housing, Preservation, and Tourism Economies – Tourism economies face challenges in affordable housing as a result of seasonal populations, high property and land values, and low-wage positions in tourism sectors. Nantucket, MA, is one community that has struggled with balancing affordable housing needs of the year-round community with the needs of the seasonal community and economy based in tourism. In recent years, however, there has been a rise in year-round residents providing critical services, such as healthcare, emergency response, and teaching, finding themselves unable to find affordable rentals, much less become homeowners. Dr. Cleary Larkin and team have been exploring Nantucket's numerous obstacles to "attainable" housing (up to 240% AMI) in the context of these priorities–historic preservation, ecological conservation, housing affordability, and tourism–which drive ideas about development on the island. This project, supported by Remain Nantucket, is ongoing and the findings and recommendations will also have high relevance to housing affordability challenges in many tourism-heavy Florida communities.

Using Industrialized Construction and Robotics to Reduce Housing Costs – Reducing construction costs can improve housing affordability by making affordable housing projects more financially viable and reducing construction time can facilitate an increase in housing supply as projects are able to be completed more quickly. Integrating new construction technologies in housing production has the potential to help both these efforts, while also making the construction process safer for workers. Dr. Aladdin Alwisy, through the Smart IDC Lab, has worked to integrate advanced construction techniques into the College. This has included a 3D construction printer—which can build housing—industrial robotic arms and other collaborative robots. Future collaboration can better understand how these technologies might change housing delivery systems, sustainability, and disaster recovery.

Advanced Modular Housing Design – Advanced Modular Housing Design (AMHD) is an innovative way to provide housing through the construction of factory-built, scalable housing units that are assembled on site. As a result, AMHD can create more resilient, affordable, and sustainable housing by reducing labor costs, weather delays, and material improvements. In a post-disaster context, this can be an effective way to house survivors. Immediately post-event, a Core unit can be rapidly deployed to provide emergency shelter for impacted residents. Over time, this can be expanded upon to transition from temporary to permanent shelter. Designs are also energy efficient, reducing energy burden on the occupant and environmental impact. This work, funded and highlighted by the U.S. Department of Housing and Urban Development2 encompasses the expertise of multiple faculty across the College, including Dr. Srinivasan, Mr. Jeff Carney, Mr. Stephen Bender, Dr. Ryan Sharston, and Mr. Bill O'Dell. This project is now in partnership with local and state Habitat for Humanity organizations for pilot implementation.

Understanding Renter Needs and Post-Disaster Outcomes – Research on the post-disaster needs and outcomes of renter populations is understudied, particularly for low-income renters or renters who were displaced. The Shimberg Center, University of Central Florida, the Horne consulting firm, and Florida Housing Coalition were selected by HUD to evaluate the effectiveness of the Community Development Block Grant – Disaster Recovery (CDBG-DR) program in addressing post-disaster recovery needs of renter households. Our research objectives are to (1) better understand CDBG-DR allocations for renters, (2) identify successful processes with corresponding outcomes for rental housing recovery aid programs, (3) engage with and link disaster recovery strategies and programs to actual and desired outcomes among renters from their lived experiences, and (4) translate this research into actionable programmatic recommendations with appropriate timelines, policy making and implementation changes. This project could be expanded into longitudinal research on the recovery outcomes of Florida renters after Hurricanes Michael, Irma, and Ian and is seeking continual funding.

The role of Circular Economies Sustainable Housing Design and Construction - Data from the National Alliance to End Homelessness shows that over 28,000 Floridians experienced homelessness in 2019. More strategies are required to increase housing affordability and reduce homelessness in Florida. A sustainable strategy explored by Dr. Patricia Kio is the role of circular economies (CE) towards providing affordable homes for Floridians. The CE approach seeks to eliminate waste while adding value to resources. Traditional virgin materials could be replaced with secondary materials, for example construction and demolition debris (CDD) and industrial byproducts in Florida could be a secondary source

of materials for developing sustainable residential housing. 20 years of CDD materials from the 67 counties in Florida could be the basis for alternative approaches of reusing CDD materials such as initial proof of concept case studies for infrastructure. Material explorations could also lead to innovative fabrication techniques and new business models. Findings can then be scaled to industrial symbiosis between the residential and industrial sectors. From an education standpoint, DCP students can be empowered to develop meaningful and innovative solutions for emerging problems such as housing affordability here in the state.

Institutional Real Estate Investment, Finance, and the Political Economy of Housing – The share of corporate and financial investment in housing has sharply increased since the financial crisis in 2008, leading to consequences in affordability, availability, and equity in housing. Dr. Renee Tapp is a leading expert in the political economy of housing and real estate and whose research focuses on ownership dynamics and consequences in rental housing markets. This is of increasing relevance in Florida as communities have taken an interest in the level of large investor or corporate ownership in their backyards, including a four-part WUSF-FM series on the issue in Tampa Bay featuring URP and Shimberg Center student Renz Torres.

Further opportunities

Beyond the current research efforts in the College, there is potential for future efforts to solidify the leadership of DCP in the area of safe, decent, and affordable housing. We conclude with ideas for future collaborative work in teaching, research, and practice.

Research

- Given the diversity of approaches and perspectives employed by DCP faculty, there is an opportunity to synthesize current innovations and best practices in housing policy, planning, design, and construction. There is a need to curate the current state of research to provide guidance on the comprehensive array of housing levers available.
- We can continue to stay abreast of housing legislation and position our work to be able to evaluate its effectiveness statewide. Future research can evaluate ongoing housing initiatives and policies across the state and initiate pilot projects and interventions that connect research to housing organizations on the ground.

Teaching

- There is also an opportunity to create greater integration among existing housing coursework in DCP to continue to empower the next generation of housing practitioners. There are multiple housing- and shelter-related courses and studios with housing components. Greater coordination among these courses can enable cross-disciplinary collaboration for students, expose them to diverse perspectives and approaches, and use applied projects to provide support for housing organizations in need of data collection and research.

Practice

- We can continue to host and explore data products, tools, and visualizations to identify and address unique housing inequities across Florida's diverse communities and place housing solutions in context. This will go hand-in-hand with ongoing research with the potential to generate new datasets for housing planning.
- We can continue to build and maintain partnerships with industry, nonprofit, and government organizations that construct, finance, and advocate for housing. This can include collecting the research needs of organizations across the state, identify funding opportunities that match these needs, and connect with expertise within the DCP.

WG's Strengths, Weaknesses, Opportunities, and Challenges:

Strengths	• Potential for high impact, especially in the state of Florida • Diverse expertise of faculty across the college • Data availability • Local partners across the state • Student interest	• Funding availability • High nonprofit and government engagement, but lower engagement with home builders	Weakness

Opportunities	• Experimenting with new technologies and housing designs • Policy evaluation • Collaborative teaching • Advocacy	• Changes to Federal housing policy and priorities • Potential time/service burden on faculty	Challenges