

# **SBRA Manufactured Housing Research Roadmap**

ORNL Manufactured Housing Workshop  
June 18, 2026

# Systems Building Research Alliance



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## *Innovation through Collaboration*

*Research underpins innovation and collaborative research between otherwise competing companies moves an entire industry forward.*

Systems Building Research Alliance (SBRA), the research arm of the factory-built housing industry, is a non-profit organization with the mission of developing new technologies that enhance the value, quality, and performance of the nation's manufactured homes.

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# SBRA Research Roadmap

- Elements of a Roadmap
- Methodology
- Results
- Contributors
- Research Underway

**Sam Rashkin  
designed and  
facilitated the  
roadmapping  
process**

# Key Elements of a Roadmap

- **Desired Outcome:** Core Purpose
- **Destination:** Critical Change / Date
- **Priorities:** Key Focal Points
- **Projects:** Key Investments
- **Path:** Optimized Investment Strategy
- **Stakeholders:** Reinforcing Activities

## Goal:

Chart an optimized path to a desired outcome.\*

\* Expect ongoing adjustments for continuous improvement

SBRA Manufactured Housing Research Roadmap:

# **Methodology**

## Step 1: Assemble Experts

### **Key Strategy:**

Leverage expert wisdom of diverse stakeholder experts to inform an optimized research investment strategy.

SBRA board and project committees guided direction and made decisions at each step.

**Listening**  
to stakeholders  
is critical to  
optimizing path and  
commitment.

# MH Roadmap Contributors

## Home manufacturers and suppliers

- Dan Adams, Stylecrest
- Bill Boor, Cavco
- Bob Blackburn, Clayton Homes
- Vladi Chernolutskiy, Skyline Champion
- Philip Copeland, Skyline/Champion, *Project Chair*
- Jayar Daily, American Homestar
- Darin Hendricks, Clayton Homes
- Chuck Morgan, HS Construction
- Leo Poggione, Craftsman Homes
- Ron Powell, Clayton Homes
- Manny Santana, Cavco
- Cameron Tomasbi, Cavco
- Michael Wade, Clayton Homes
- John Weldy, Clayton Homes

## Consultants and researchers

- Francis Conlin, High Performance Building Solutions
- Chris Nicely, ManufacturedHomes.com
- Brady Peeks, Northwest Energy Works
- Jordan Dentz, System Building Research Alliance
- Janet McIlvaine, Florida Solar Energy Center
- Joe Nebbia, Newport Partners

## Regulatory organizations and agencies

- Ashok Goswami, Institute for Building Technology & Safety
- Dave Tompos, International Code Council NTA
- Jason McJury, U.S. Dept. of Housing & Urban Development

## Trade organizations

- Amy Bliss, Wisconsin Manufactured Housing Industry Alliance
- Lesli Gooch, Manufactured Housing Institute

# Step 1: Assemble Experts

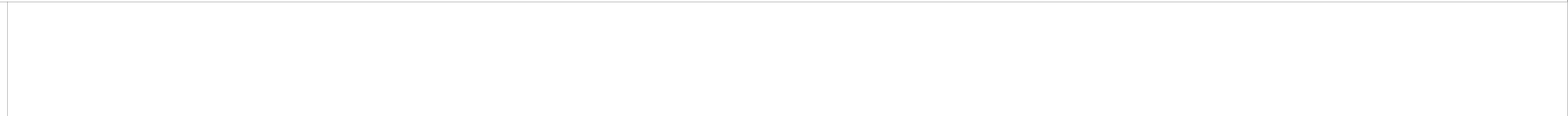
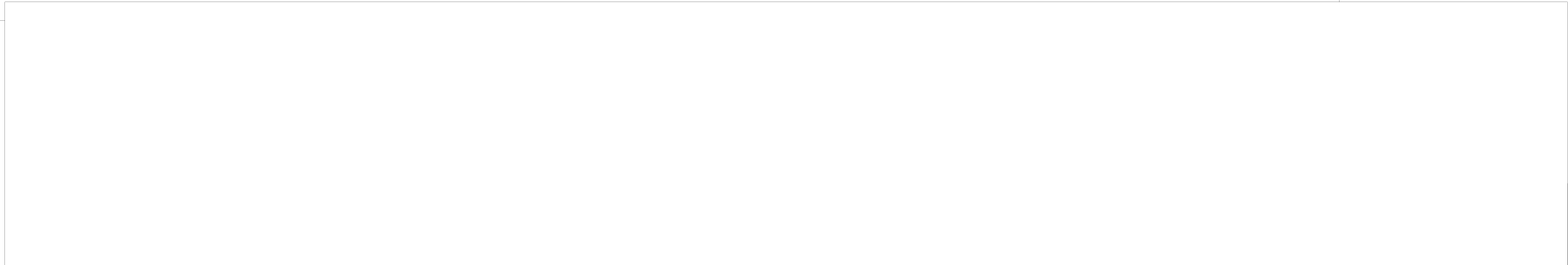
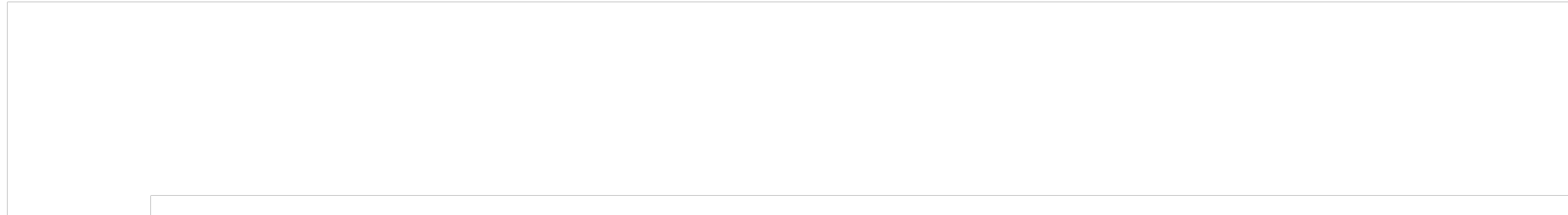
Expert Background	Number of Experts [Out of 24 Total]												
Manufacturer													
Consultant													
Regulatory													
Researcher													
Association													

**“Right People on the Bus”**  
critical for an effective roadmap.

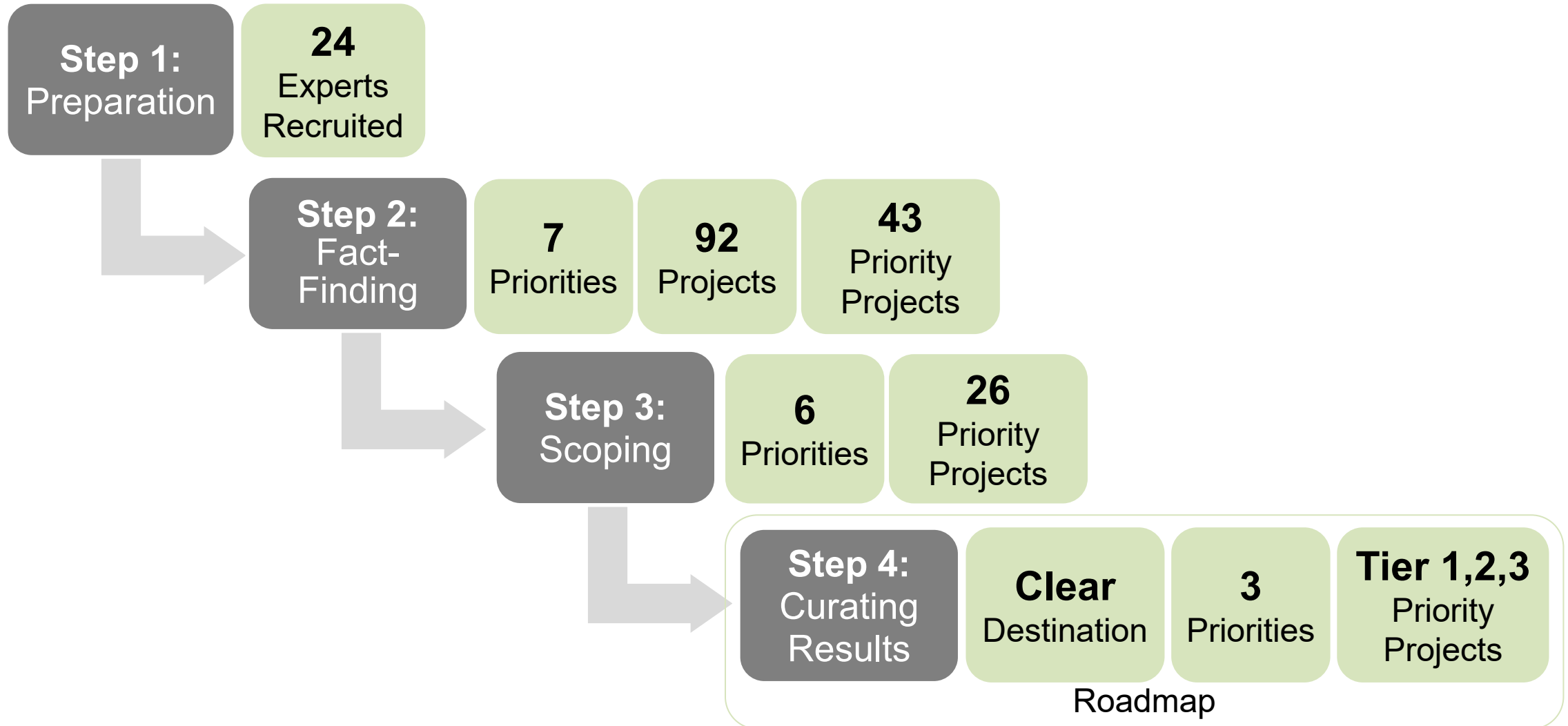
# Key Steps / Outcomes / Experts Engagement

## Step 1: Preparation

- Project Plan
- Assembled Group of Experts



# Key Steps / Results



SBRA Manufactured Housing Research Roadmap:

# Results

## Roadmap: Desired Outcome

### **Grow Market Share**

for manufactured housing by 2035.

**‘Why’**

**Manufactured  
Housing:**

Enhance attainability  
for American home  
buyers.

# Roadmap: Destination

## **Shift Local Communities**

from blocking manufactured housing to embracing it as a compelling opportunity for attainable housing by 2035.

## **Off-the-Shelf Solution**

for local communities to fix their housing attainability problem.

# Roadmap: Research Priorities

- 1. Ensure Parity with Site-Built Homes:**  
Critical for removing local community objections
- 2. Optimize Homebuyer Affordability:**  
Critical for addressing local community housing crisis
- 3. Mitigate Regulatory/Zoning Barriers:**  
Critical for leveraging progress with enhanced parity and affordability

**Focus:**  
Research  
investments aligned  
with priorities.

## Step 3: Scoping – Project Descriptions

### **26 Projects:**

- Problem Addressed or Opportunity
- Solution to Problem or Opportunity
- Time Frame
- Key Products and/or Deliverables
- Key Project Metrics for Impact
- Cost (low <\$200K; medium \$200K - \$500K; high >\$500K)

# Roadmap: Optimized Path Research Investments

- **Tier 1:**  
High-Impact, Low Risk Projects
- **Tier 2:**  
High-Impact, Medium Risk Projects
- **Tier 3:**  
Medium-Impact, Medium Risk Projects

**Outcome:**  
Housing attainability  
is enhanced for  
American home  
buyers.

Tier	Parity	Affordability	Regulatory
<p>1 High impact low risk</p>	<ul style="list-style-type: none"> <li>Air sealing</li> <li>Comparative analysis with site-built</li> <li>Whole house ventilation</li> <li>Updated installer training</li> <li>Higher insulated assemblies</li> </ul>	<ul style="list-style-type: none"> <li>Automated in-plant inspections</li> <li>Advanced manufacturing opportunities</li> </ul>	<ul style="list-style-type: none"> <li>Attainability training for local regulators</li> <li>HUD Code updates</li> <li>Thermal load calculation software</li> <li>Mitigating local barriers</li> </ul>
<p>2 High impact medium risk</p>	<ul style="list-style-type: none"> <li>Factory-installed HVAC</li> <li>Optimized floor assembly</li> </ul>		<ul style="list-style-type: none"> <li>Chassis removal</li> </ul>
<p>3 Medium impact medium risk</p>	<ul style="list-style-type: none"> <li>Optimized service solutions</li> <li>Set-up best practices</li> <li>Industry-wide installation system</li> <li>Optimized foundations</li> <li>Architectural design</li> </ul>	<ul style="list-style-type: none"> <li>Quality problems and solutions</li> </ul>	
<p>Low impact &amp;/or low risk</p>	<ul style="list-style-type: none"> <li>Slab-on-grade foundation</li> <li>HUD Code/IRC gap analysis</li> </ul>	<ul style="list-style-type: none"> <li>Optimizing design and production software</li> <li>Roof optimized for factory installed solar</li> </ul>	<ul style="list-style-type: none"> <li>Creative land-use approaches</li> <li>New MH market opportunities</li> </ul>

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SBRA Manufactured Housing Research Roadmap:

# **Research Underway**

# Project Scoping

## Five Projects Selected

1. Automated In-plant Inspections
2. High-R Assemblies
3. Attainability Training for Regulators
4. Optimized Floor System/Integrated Chassis
5. Optimized Foundation Solutions

Established Goals

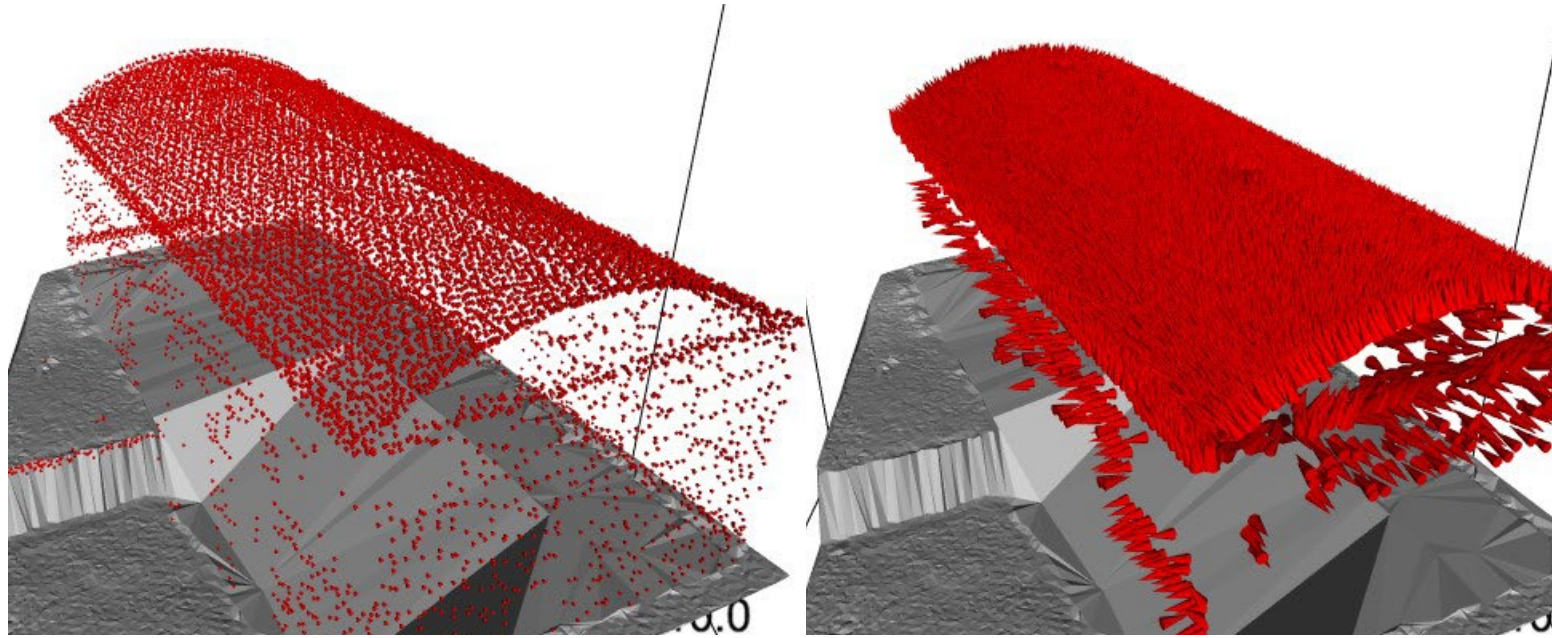
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graph TD; A[Established Goals] --> B[Developed SOW]; B --> C[Identified Potential Contractors]; C --> D[Established Budget and Timeline];
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Developed SOW

Identified Potential  
Contractors

Established Budget and  
Timeline

# Automated In-Plant Inspection



Identify strategies for AI-enabled automated production inspection and/or digital QA that improve quality, reduce rework and service costs, enhance efficiency, and improve customer satisfaction.

# Automated In-Plant Inspection Approach

- Engage up to five consultants to conduct investigations in plants
- Assess adoption requirements, costs, impacts
- Support, not replace, inspectors
- Emphasize collaboration, testing, and knowledge-sharing



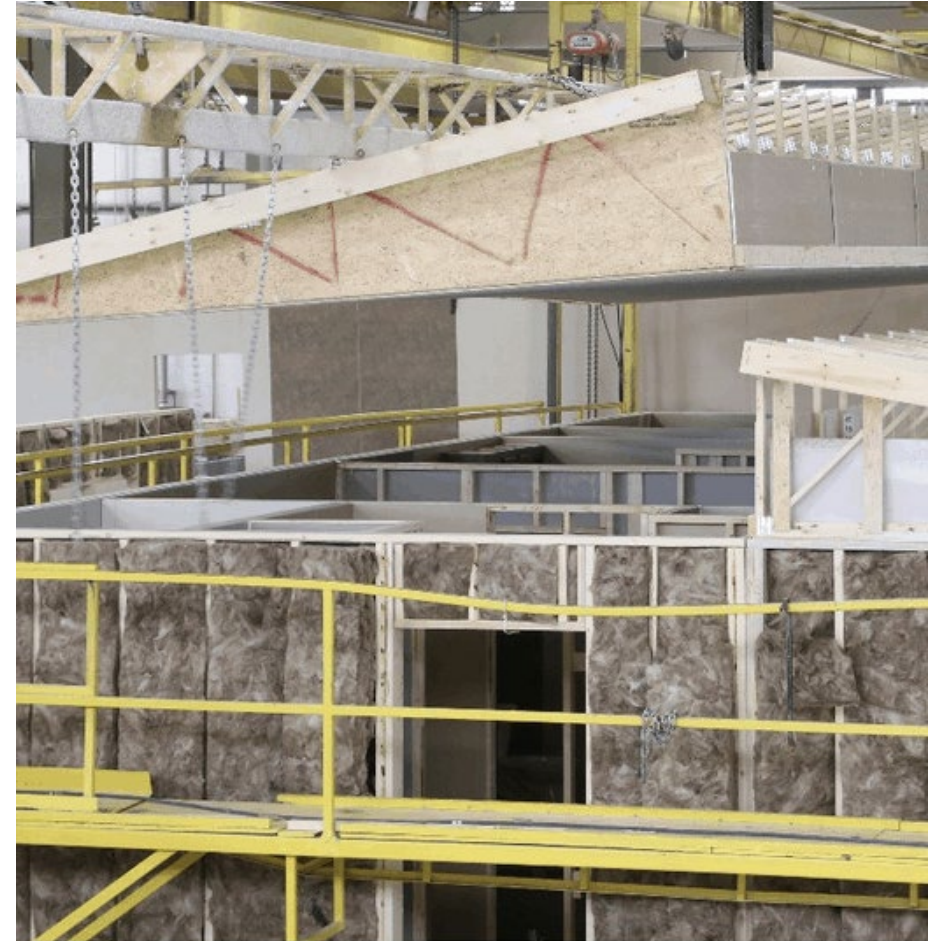
# Cost-Effective High-R Assemblies



Develop practical, durable, cost-effective solutions for high performance MH envelopes. Address past challenges in achieving cost-effectiveness and production compatibility by targeting specific thermal weak points.

# Cost-Effective High-R Assemblies Approach

- Four goal categories: walls, roofs, floors, and airtightness
- Several investigation strategies contribute towards each goal
- Each research question addressed in a focused effort
- Strategies that pass vetting proceed to prototyping and testing (future)



# Cost-Effective High-R Assemblies Targeted Goals

- 1. Walls:** Develop 2x4 walls with 2x6 R-values (R-21), enabling plants to use one wall in all climate zones
- 2. Roofs:** Improve eave insulation without increasing truss heel height or roof slope
- 3. Floors:** Improve bottom liner durability and airtightness, without causing moisture issues
- 4. Floors:** Improve floor system airtightness



# Cost-Effective High-R Assemblies Outcomes

- Initial assessment of the benefits and practicality of several targeted thermal strategies that could cost-effectively boost thermal performance
- Understanding of air leakage characteristics of typical MH floor system and impact of transportation



# Attainability Training for Local Regulators



Prepare a toolkit and training curriculum to help local governments remove barriers to manufactured housing, thereby expanding the market for existing products.

# Attainability Training for Local Regulators Approach

- Prepare toolkit with case studies, educational resources, and multimedia materials
- Develop an implementation plan for the training program
- The toolkit will emphasize the importance of local jurisdictions' role in MH installation quality enforcement
- Materials tailored to urban, suburban and rural locations



# Attainability Training for Local Regulators Outcome

- Off-the-Shelf educational toolkit for use in removing market barriers to MH in all regions of the US
- Comprehensive plan to roll the toolkit out to maximize its use and effectiveness



# Optimized Floor with Integrated Chassis



Develop a floor systems that increases structural and thermal efficiency and durability and successfully manages moisture while reducing overall system thickness.

# Optimized Floor with Integrated Chassis Approach

- Focus on a permanent chassis system compliant under current HUD Code
- Measure in-transit loads
- Establish a standard structural-analysis method and chassis design process
- Consider integrated floor-chassis structure to reduce height
- Engage outside experts to identify scalable solutions



# Optimized Floor with Integrated Chassis Outcomes

- Criteria for acceptable transit damage
- Standard road test protocol
- Standard chassis/floor structural analysis method
- Design solutions that meet pro-forma criteria
- Test results to demonstrate production, transportation and in-service loading performance



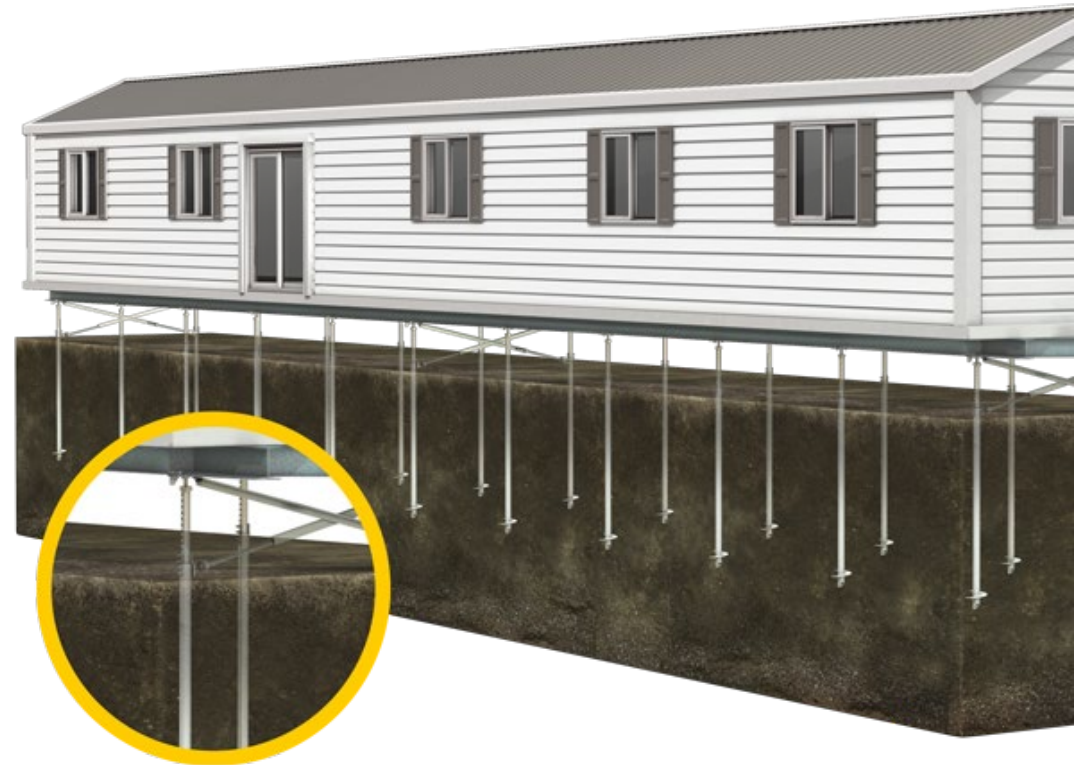
# Optimized Foundation Solutions



Pier and anchor foundations are perceived as inferior to permanent foundations. Some jurisdictions mandate IRC foundations, eliminating MH market advantage. This project will develop a low-cost IRC compliant MH foundation.

# Optimized Foundation Solutions Approach

- Do not compete with pier and pad systems on cost
- Take advantage of the IRC Alternative Design Provision (R104.11)
- Lower set height
- Take advantage of chassis structural properties
- Develop region-specific solutions
- Investigate wood foundations, steel frame foundations, recessed (pit) sets, pre-cast, panelized, helical piles, and hybrids of these options with proprietary structural systems



# Optimized Foundation Solutions Approach

- One or more design solutions that meet pro-forma criteria
- Test results demonstrating installation and in-service performance (future scope)



# Request for Proposals

- Open RFP for these projects.
- Details at:

<https://www.research-alliance.org/rfp>

## Request for Proposals

SBRA is undertaking a range of research activities to advance the manufactured housing industry by growing market share, improving home performance, and leveraging its inherent affordability advantage. As part of this effort, the SBRA Board of Directors selected five priority projects for detailed scoping. We are now requesting proposals from qualified consultants – including academics, technology providers, and industry experts to lead investigations.



### **Automated In-Plant Inspections**

Identify strategies for AI-enabled automated production inspection and digital QA that improve quality, reduce rework and service costs, enhance efficiency, and improve customer satisfaction.

**Posted Date:** May 29, 2026

**Closing Date:** June 26, 2026

[Download RFP](#)



### **MH Attainability Training for Local Regulators**

Prepare a toolkit and training curriculum for local governments to successfully remove barriers to manufactured housing, thereby expanding the market for existing products.

**Posted Date:** May 29, 2026

**Closing Date:** June 26, 2026

[Download RFP](#)

# California Energy Commission Project

## Title 24 compliant HUD-code homes



<https://www.research-alliance.org/ca-title-24>

### Design Target

- All-electric homes meeting Title 24 performance intent
- Operate within 100-amp service constraints
- Maintain low first cost and production viability
- Fire resilient

### Three Pathways Tested

- Envelope-first approach: Improve resilience and reduce energy
- Low-wattage design: Efficient appliances to reduce peak loads
- Load management: Smart panels to sequence and limit demand

### Core Technologies

- Advanced envelope measures
- Factory-installed solar and heat pumps
- Smart electrical panels

# Thank You

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