VOLUNTARY RESILIENCE STANDARDS

AN ASSESSMENT OF THE EMERGING MARKET FOR RESILIENCE IN THE BUILT ENVIRONMENT

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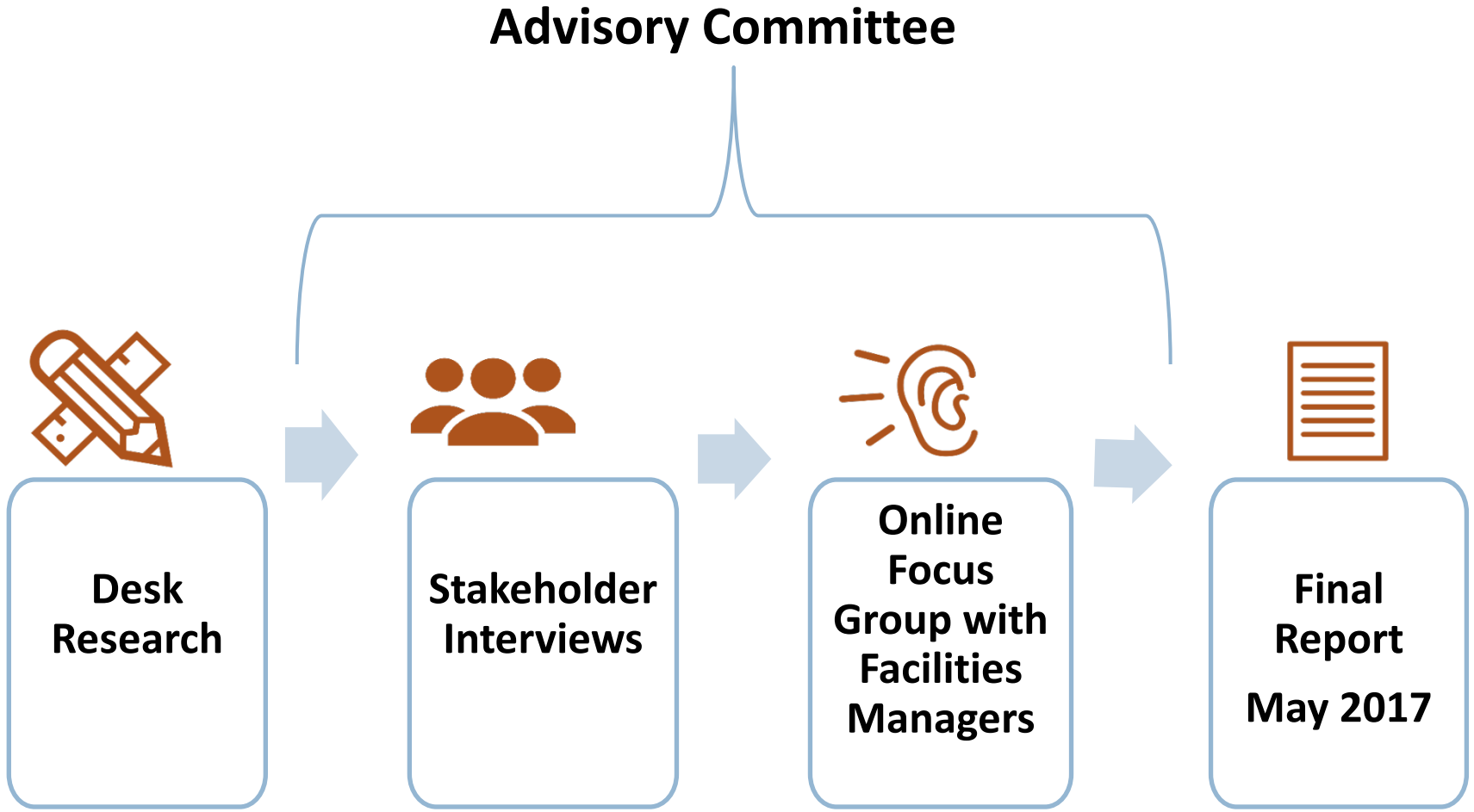
Agenda

- Methodology and process
- Framework for understanding the market
- Walk through resilience standards, frameworks, and guidelines
- Discuss overall market positioning and current landscape
- Key takeaways for moving the market forward

Process


Advisory Committee
Desk Research
Stakeholder Interviews
Online Focus Group with Facilities Managers
Final Report
May 2017

Reviewed Standards

Facility-Scale

- Building Resilience—Los Angeles Project (BRLA)
- Building Resilience Rating Tool (BRRT)
- Envision
- FORTIFIED
- LEED Pilot Credits (v. 1)
- PEER
- RELi Resiliency Action List
- Resilience Based Earthquake Design Initiative (REDi)
- Sustainable Sites Initiative (SITES)
- Enterprise Green Communities Certification

Community-Scale

- Alliance for National and Community Resilience (ANCR)
- Interagency Concept for Community Resilience (ICCR)
- Unified Facilities Criteria (UFC)
- NIST Community Resilience Assessment Methodology (CRAM)

Evaluation Framework

Target Audience

- **Facility Type**
  - Infrastructure
  - Commercial
  - Campus
- **Scale of focus**
  - Facility
  - Community
- **Building life cycle**
  - New
  - Retrofit
- **Outside System**

Impact and Scope

- **Hazards included**
  - Hazard specific
  - Hazards assessed
- **Performance Goals**
- **Incorporation of social vulnerability**

Standard Development Process

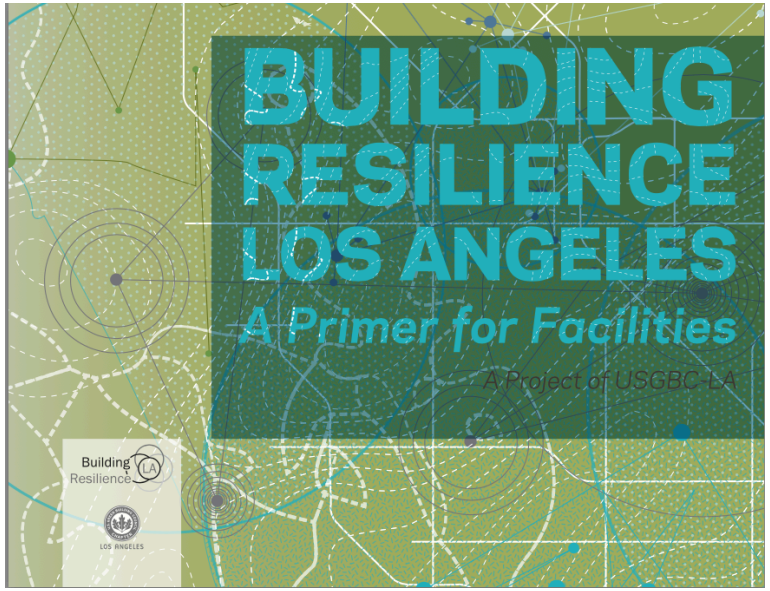
- **Driver**
- **Verification process**

Comparative Framework (Subset for illustration)

	Target Audience					Impact and Scope			Standard Development Process			
Standard	Facility Type	Scale		Life Cycle		Systems	Hazards Included	Performance Goals	Social Vulnerability	Driver		Verification	
		F	C	New	Retrofit					Industry	Community	Internal	External
BRLA	All	✓			✓	N	Holistic (planning framework)		●	✓	✓		
Envision	Infrastructure		✓	✓	✓	Y	Holistic		◑	✓		✓	✓
FORTIFIED	Commercial	✓		✓	✓	N	Wind, hurricanes, hail	Business continuity	○	✓			✓
LEED Pilot	Commercial	✓		✓		Y	Holistic	Passive survivability*	○	✓			✓
PEER	Commercial, campus	✓		✓	✓	N	Power outage	Improving power performance	○	✓			✓
REDi	All	✓		✓		Y	Earthquakes	Building re-occupancy and recovery	○	✓		✓	
RELi	All	✓	✓	✓		Y	Holistic		◑	✓	✓	✓	
SITES	Commercial	✓		✓		N	Sea-level rise, flooding, temperature		○	✓			✓

Building Resilience Los Angeles (BRLA)

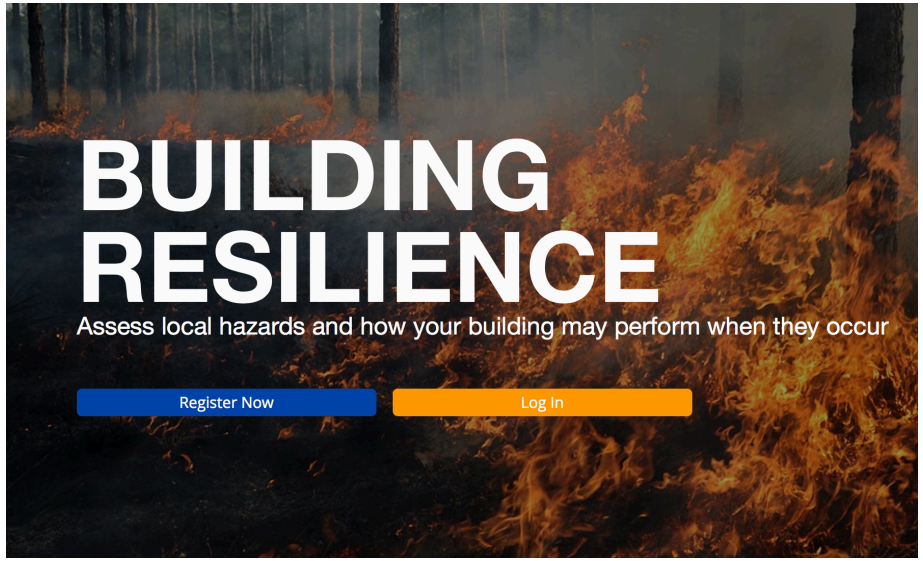
- Created by the U.S. Green Building Council Los Angeles Chapter
- BRLA seeks to strengthen community resilience by **positioning facilities preparedness in the context of resilience for the broader community**. BRLA staff have started to deliver trainings, but benchmarking standards are still in development.



Target Audience				Impact and Scope			Standard Development Process	
Facility Type	**Scale**	**Life Cycle**	**Outside Systems**	**Hazards**	**Performance Goals**	**Social Vulnerability**	**Driver**	**Verification**
All	Facility	Retrofit	No	Holistic (planning framework)	-	●	Industry & Community	-

Building Resilience Rating Tool (BRRT)

- The BRRT was created by the Insurance Council of Australia
- **Simplified insurance risk rating tool** for residential properties
- **Uses geography, slope, construction materials to calculate risk** related to wildfire and flooding.



Target Audience				Impact and Scope			Standard Development Process	
Facility Type	**Scale**	**Life Cycle**	**Outside Systems**	**Hazards**	**Performance Goals**	**Social Vulnerability**	**Driver**	**Verification**
Residential	Facility	Retrofit	No	Fire, Wind, Hail, Flood	Minimize Damage	○	Industry	-

Envision

- Developed by the Institute for Sustainable Infrastructure and the Zofnass Program for Sustainable Infrastructure at Harvard
- Envision is **designed to measure the sustainability of public works project**s, with resilience as a key consideration. Envision is available in the market.
- Currently piloted in Los Angeles for public works projects.

Target Audience				Impact and Scope			Standard Development Process	
Facility Type	**Scale**	**Life Cycle**	**Outside Systems**	**Hazards**	**Performance Goals**	**Social Vulnerability**	**Driver**	**Verification**
Infrastructure	Community	Retrofit/New	Yes	Holistic	-	◑	Industry	Internal & External

FORTIFIED

- The FORTIFIED standards are designed to build **resilience to hurricanes, high winds, and hail, and can be applied to business, commercial, and residential properties**.
- The standards were developed by the Insurance Institute for Business and Home Safety. FORTIFIED is available in the market.

Target Audience				Impact and Scope			Standard Development Process	
Facility Type	**Scale**	**Life Cycle**	**Outside Systems**	**Hazards**	**Performance Goals**	**Social Vulnerability**	**Driver**	**Verification**
Commercial & Residential	Facility	Retrofit & New	No	Wind, Hurricane, Hail	Business continuity (commercial)	○	Industry & Community	External

LEED Pilot Credits on Resilient Design

- Developed by the U.S. Green Building Council
- 3 specific credits that provided additional points for buildings undergoing LEED certification process.
- Focuses on resilience at the facility level
- **USGBC is currently updating** the LEED Pilot Credits.

Target Audience				Impact and Scope			Standard Development Process	
Facility Type	**Scale**	**Life Cycle**	**Outside Systems**	**Hazards**	**Performance Goals**	**Social Vulnerability**	**Driver**	**Verification**
Commercial	Facility	New	Yes	Holistic	Passive Survivability	○	Industry	External

Performance Excellence in Electricity Renewal (PEER)

- Administered by Green Business Certification (GBCI).
- Third-party certification program to measure and improve power system performance for campuses, municipalities, and electricity supply projects.
- Developed by EPRI and Motorola

Target Audience				Impact and Scope			Standard Development Process	
Facility Type	**Scale**	**Life Cycle**	**Outside Systems**	**Hazards**	**Performance Goals**	**Social Vulnerability**	**Driver**	**Verification**
Commercial, Campus	Facility	New & Retrofit	No	Power Outage	Improve power performance	○	Industry	External

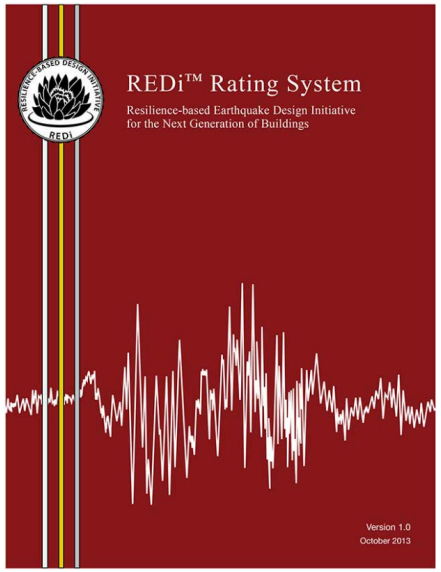
RELi Resiliency Action List

- Administered by Perkins + Will
- A list of **more than 60 actions focused on facility planning, design, operations and maintenance**.
- Pilot credits **reference existing standards** on the market.

Target Audience				Impact and Scope			Standard Development Process	
Facility Type	**Scale**	**Life Cycle**	**Outside Systems**	**Hazards**	**Performance Goals**	**Social Vulnerability**	**Driver**	**Verification**
All	Facility, Community	New	Yes	Holistic	-	◑	Industry & Community	External

Resilience-Based Earthquake Design Initiative (REDi)

- Created by Arup
- Technical design standards for buildings susceptible to seismic hazards and tsunamis
- Provides ratings to buildings at the Silver, Gold, and Platinum levels with expected ratings based on downtime after an event occurs.



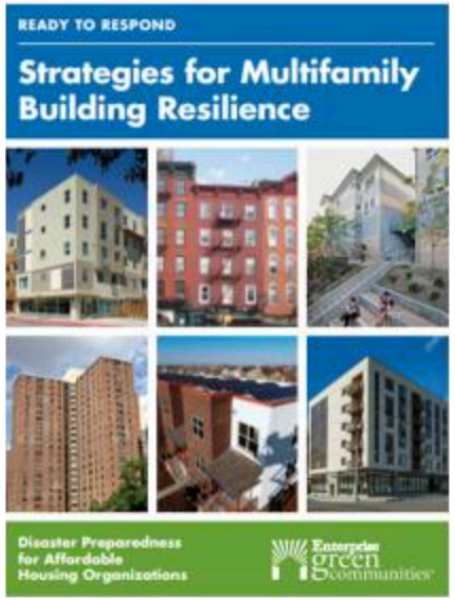
Target Audience				Impact and Scope			Standard Development Process	
Facility Type	**Scale**	**Life Cycle**	**Outside Systems**	**Hazards**	**Performance Goals**	**Social Vulnerability**	**Driver**	**Verification**
All	Facility	New	Yes	Seismic	Building re-occupancy and recovery	○	Industry	Internal

Sustainable Sites Initiative (SITES)

- Administered by the GBCI
- Developed by the American Society of Landscape Architects Fund, the Lady Bird Johnson Wildflower Center, and the U.S. Botanic Garden.
- Comprehensive rating system for developing sustainable landscapes and includes considerations for resilience.

Target Audience				Impact and Scope			Standard Development Process	
Facility Type	**Scale**	**Life Cycle**	**Outside Systems**	**Hazards**	**Performance Goals**	**Social Vulnerability**	**Driver**	**Verification**
Commercial	Facility	New	No	Sea level rise, flood, temperature	-	○	Industry	External

Enterprise Green Communities



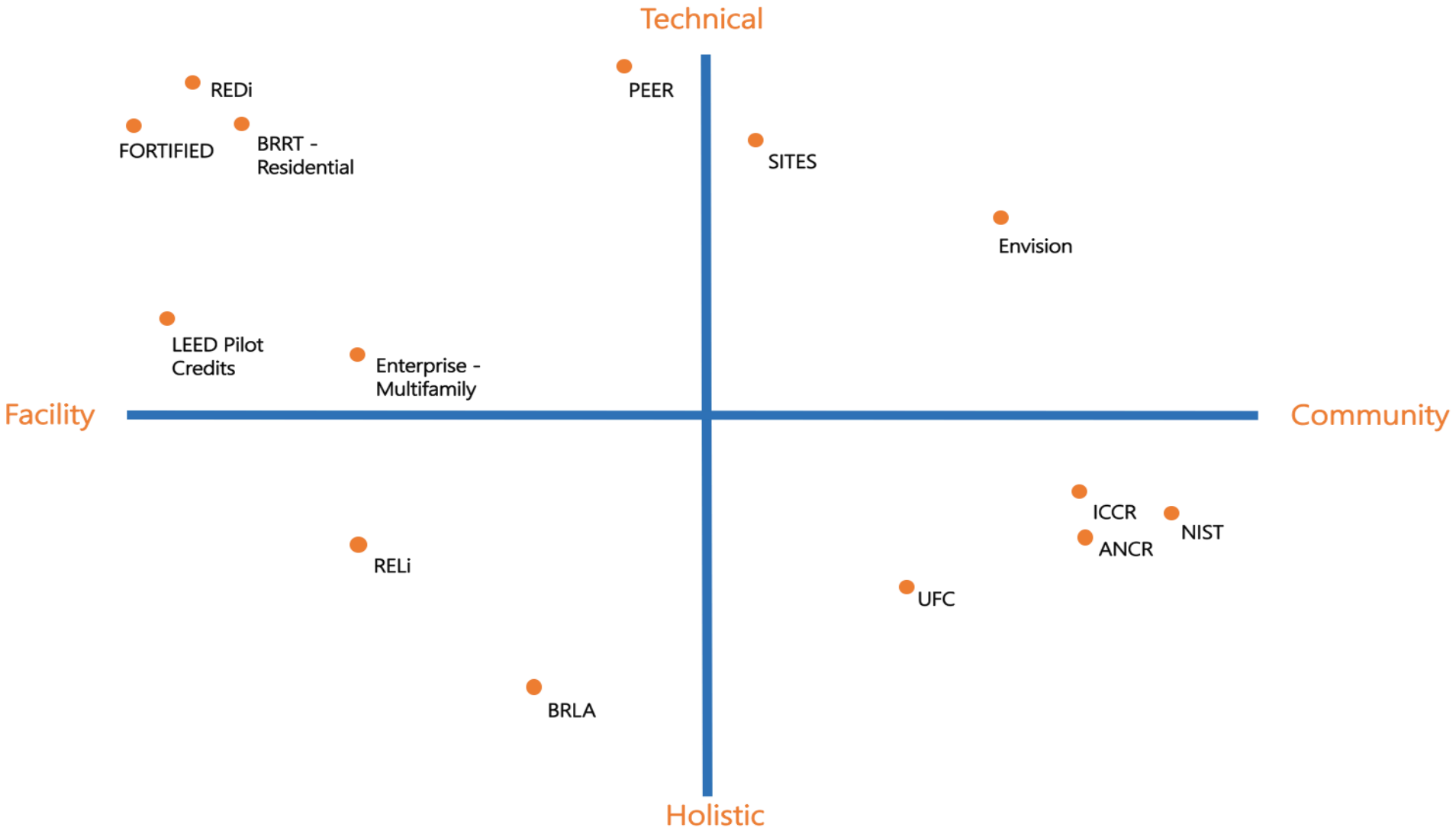
- Created and administered by Enterprise Community Partners
- Certification program designed for new construction and existing buildings with affordable housing units
- Created an accompanying Ready to Respond Toolkit focusing on resilience during disasters and retrofit guidance.

Target Audience				Impact and Scope			Standard Development Process	
Facility Type	**Scale**	**Life Cycle**	**Outside Systems**	**Hazards**	**Performance Goals**	**Social Vulnerability**	**Driver**	**Verification**
Residential, multifamily	Facility	New & Retrofit	Yes	Holistic	-	●	Industry	Internal & External

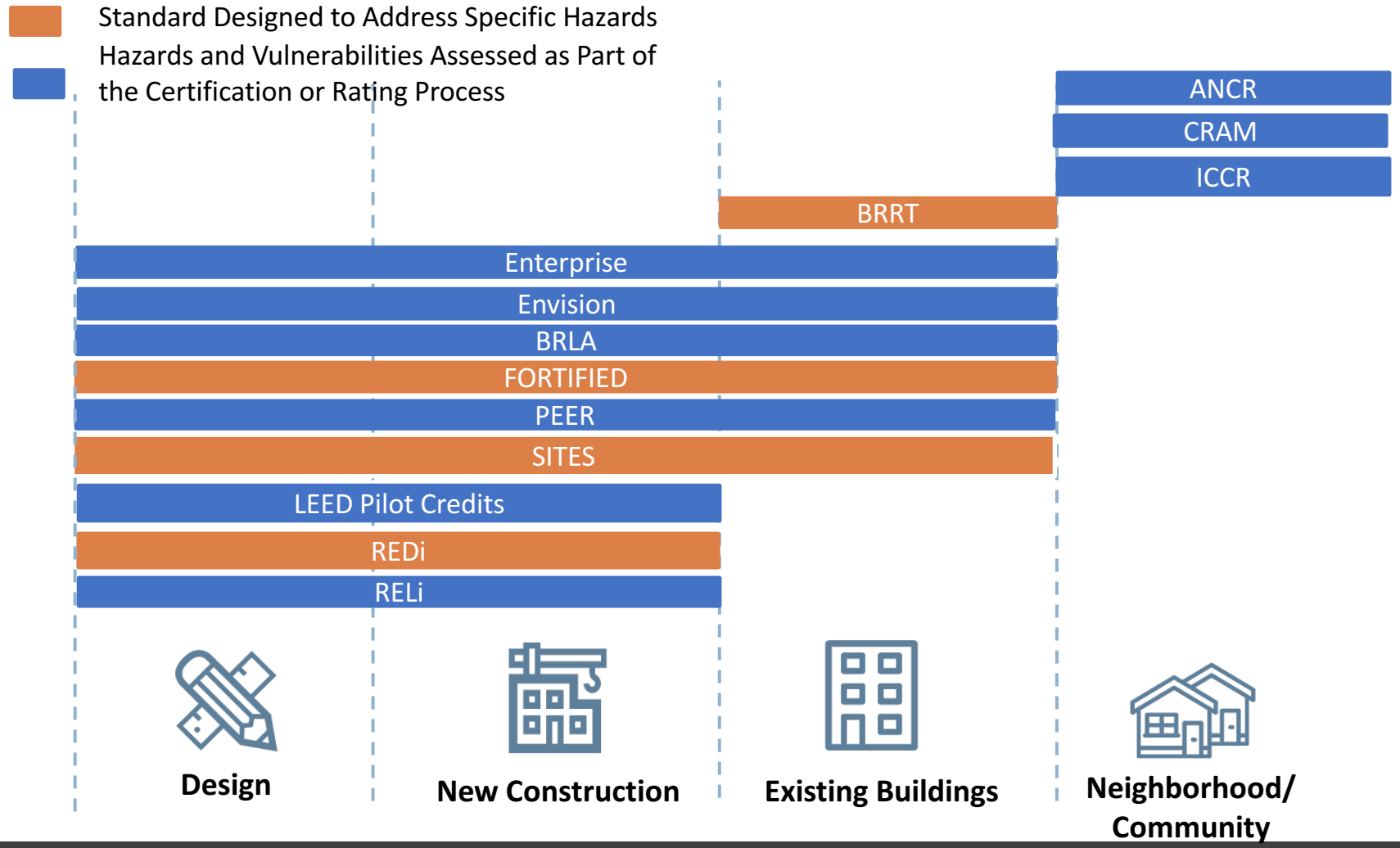
Community-Scale Standards for Resilience

- **Alliance for National and Community Resilience (ANCR):** A nonprofit formed by the International Code Council with partners in the nonprofit and private sectors. Currently designing a community resilience benchmarking system. →**in development**
- **Interagency Concept for Community Resilience (ICCR):** Draft resilience indicators identifying national-level measures that contribute to community resilience developed by NOAA and FEMA. →**in development**
- **Unified Facilities Criteria (UFC):** Developed by the U.S. Department of Defense. The criteria incorporate sustainability principles and considerations for resilience to natural, climate-induced, and human-induced hazards. The criteria are currently used by U.S. military installations. →**in use**
- **NIST Community Resilience Assessment Methodology (CRAM):** Developed by the National Institute of Standards and Technology, CRAM is designed to assess infrastructure preparedness to understand overall community resilience. →**in development**

Market Positioning



Project Life Cycle



Takeaways

Market is still emerging

- Many standards are in the pilot stages or working with first set of customers

Value proposition not yet clear for facilities

- Limited monetary incentives from insurance breaks
- Limited regulatory incentives from state or local governments

Proactive facilities managers and property owners unsure where to start

- Lack of familiarity with standards
- Outreach on topic not occurring from trusted voices (e.g. BOMA or NAIOP)

Next Steps

Strategy	Lender & Investor	Foundation	States	Local Jurisdictions	Facility Owner / Manager	Standard Developer	Insurance Sector
Streamline and unify resilience standards		●			●	●	●
Explore code and insurance regulation		●	●	●		●	●
Adopt local policy options				●			
Deliver technical assistance to facility managers and property owners	●	●	●	●	●	●	●
Demonstrate the ROI of resilience standards	●	●			●	●	●
Education and outreach		●		●		●	

Contact

Report Website

- http://www.mc-group.com/voluntary-resilience-standards-an-assessment-of-the-emerging-market-for-resilience-in-the-built-environment/

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