Pathway to Resilience in the Built Environment

Overcoming the Standards Bias

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ASTM Resilience Workshop
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Topics

1. Multi-$T problem
2. Root causes
3. Standards bias
4. Arguments for low standards
5. Consumer
6. 10-step ‘Pathway to Resilience’

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My Resilience Journey

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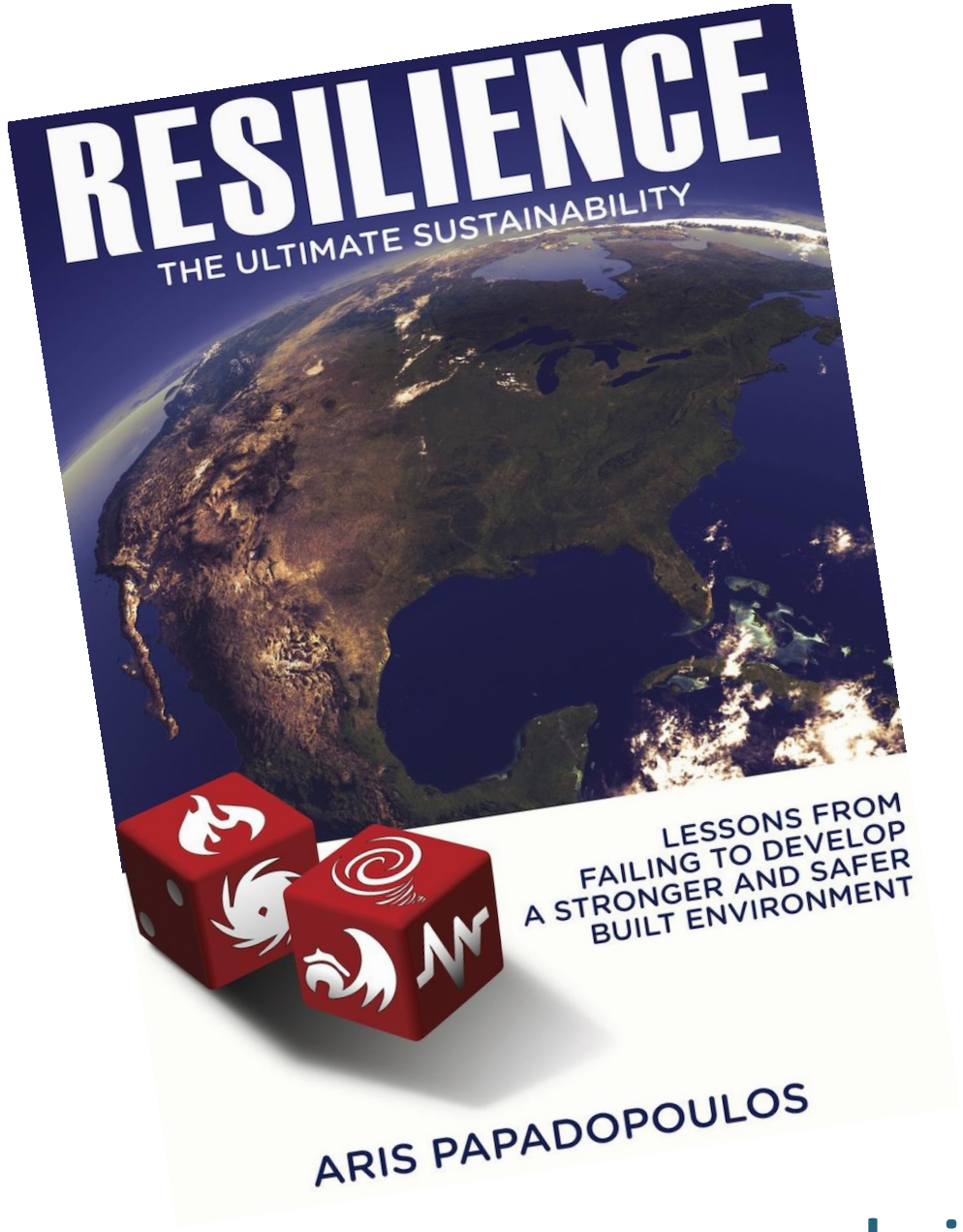

www.buildingresilient.com

ASTM Mission:

Positively impact public health & safety, consumer confidence and quality of life

Strategic Objective:

Be relevant and enhance technical quality of standards by providing best-in-class scalable development infrastructure

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Admit the problem

Too many homes/communities fail from hazards

Billion-dollar events to affect the U.S. from 1980 to 2018 (CPI-Adjusted)

DISASTER TYPE	NUMBER OF EVENTS	PERCENT FREQUENCY	CPI-ADJUSTED LOSSES *(BILLIONS OF DOLLARS)*	PERCENT OF TOTAL LOSSES
Drought	26	10.8%	$244.3 CI	14.6%
Flooding	29	12.0%	$123.5§ CI	7.4%§
Freeze	9	3.7%	$30.0 CI	1.8%
Severe Storm	103	42.7%	$226.9 CI	13.6%
Tropical Cyclone	42	17.4%	$919.7 CI	55.1%
Wildfire	16	6.6%	$78.8 CI	4.7%
Winter Storm	16	6.6%	$47.3 CI	2.8%
All Disasters	**241**	**100.0%**	**$1,670.5** CI	**100.0%**

Source: NOAA

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Four hazards account for 80+% of economic losses

- Wind
- Water
- Fire
- Geoseismic

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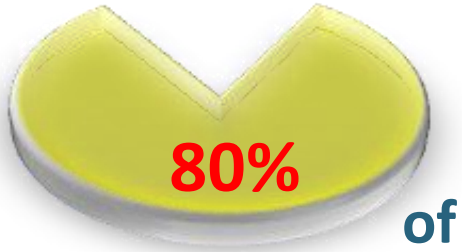
Last 20yrs fatalities ⬇40%
facility losses ⬆40%*

of losses are
Built Environment



of B/E losses
are Private

of Private losses
are Residential

* Global
Source: UNDRR

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70% of losses in Developed Economies

Developing Economies:
Lack of standards & enforcement

Developed Economies:
Low standards

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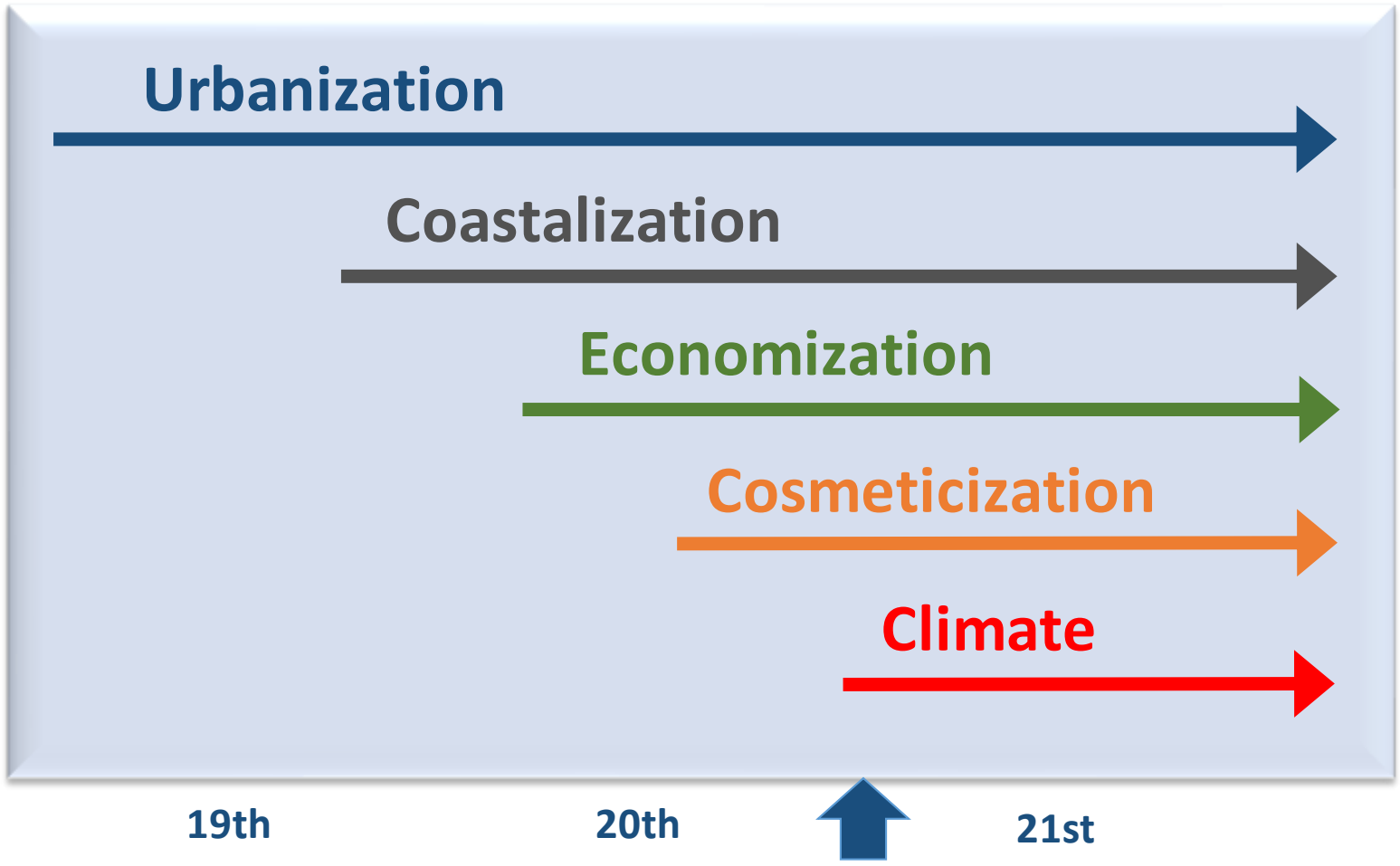
Drivers of Built Environment Risk



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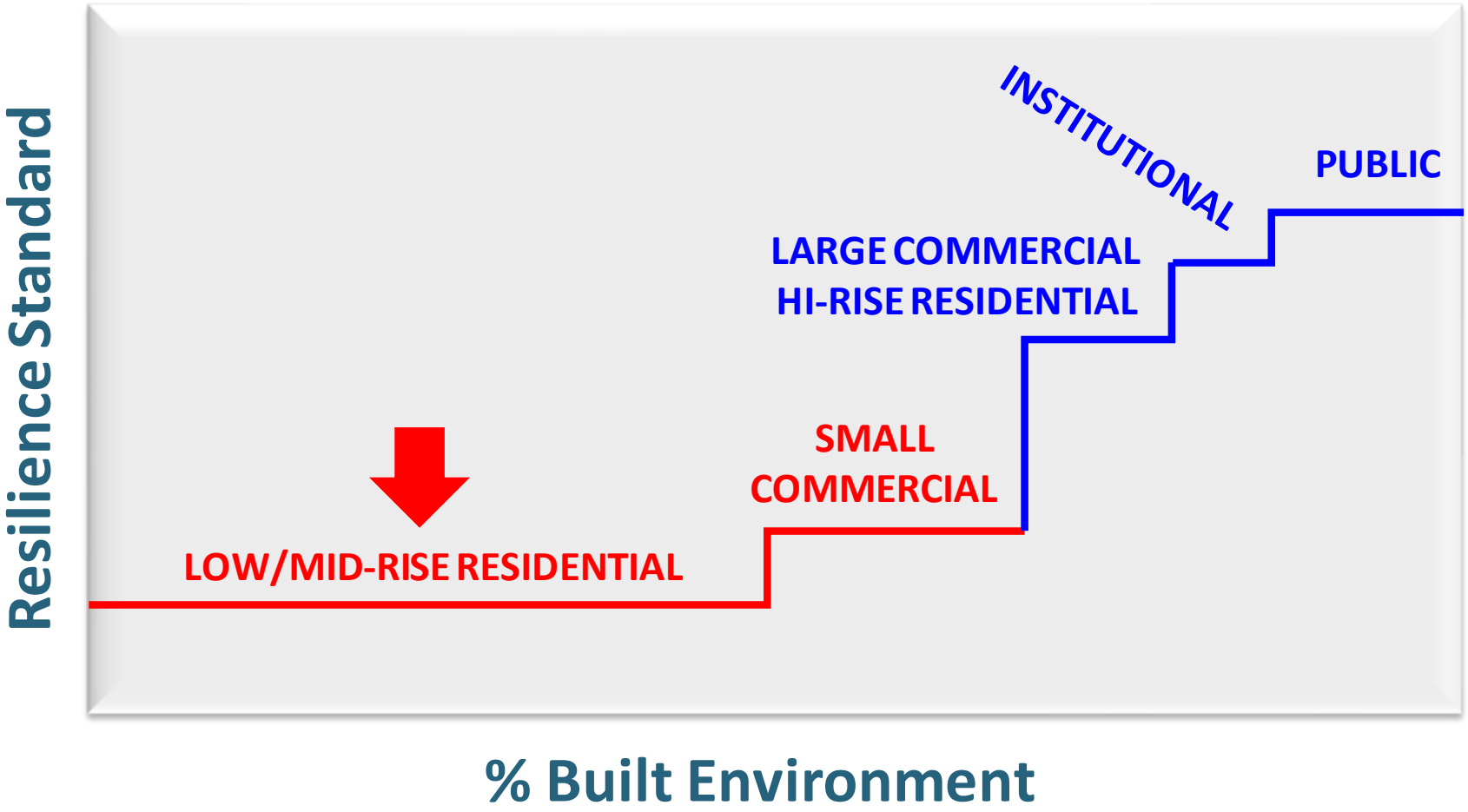
Built Environment Dichotomy



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Root Cause Analysis

Are hazards strong,
or assets too weak?

Are assets weak
because standards are too low?

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Are resilience standards low, because processes systemically bias downwards?

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What is the ‘standard’ for Standards?

- Life survival/escape?
- Affordability?
- Green?
- Economic development?
- Range of useable materials?
- Builder/developer preferences?
- Building survival?

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What counts for Resilience is surviving high hazard events

Humans compromise

Nature doesn't

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~~Natural~~ Disasters

Natural Hazards

+

Vulnerable Development

=

Development Disasters

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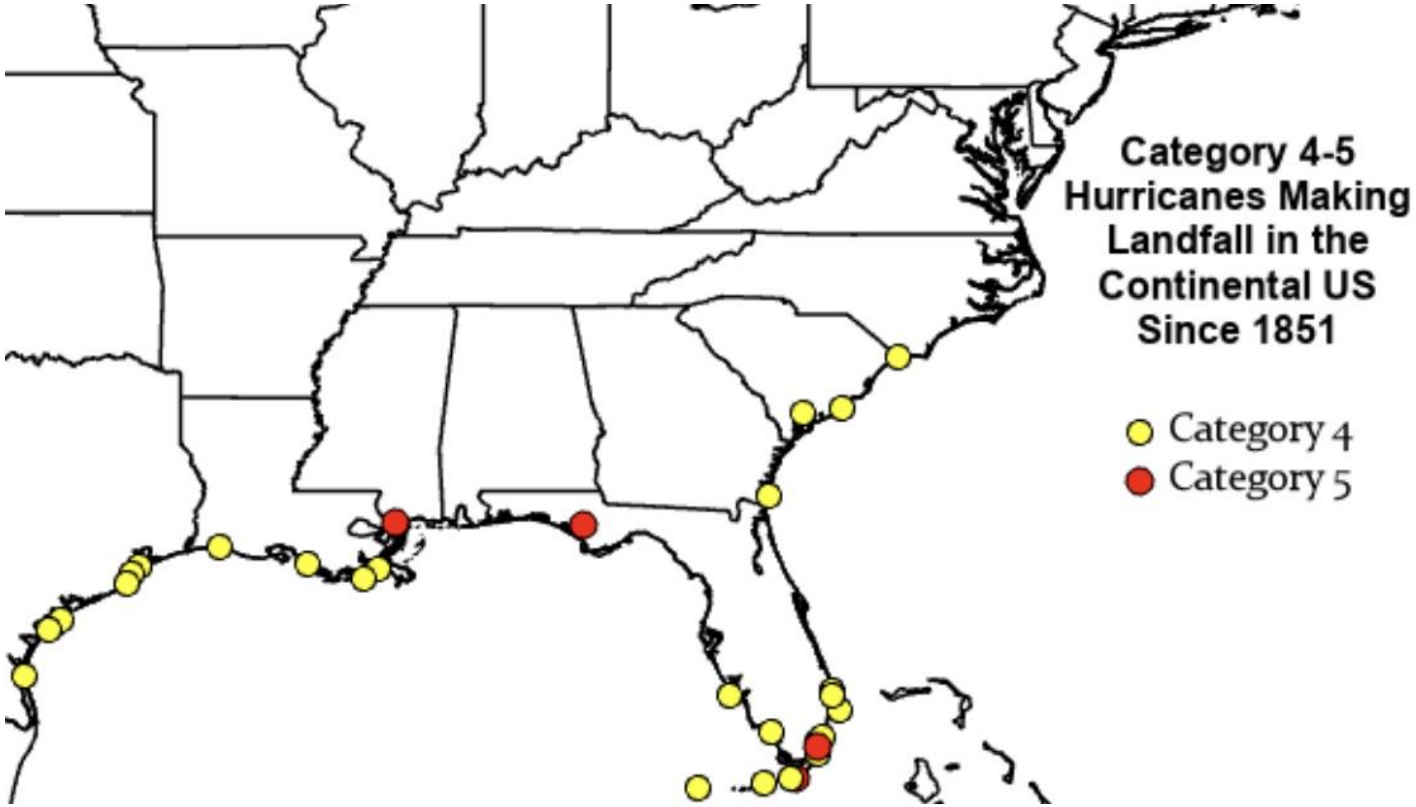
Case Study: Cat-4+ Hurricanes

Gulf & Atlantic Coasts (S. of VA) in line of fire



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So, other than S. Florida, why are Standards set to Cat-2/3?

1. 'Model standards' consensus process convinced risk not severe
2. Politicians concerned with economic impact
3. Economic interests lobby for low standards
4. Consumers prefer chancing it

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An Industry Truth

Higher Resilience Standards
reduce developer/builder profit,
if consumer is not educated to value

(most developers/builders are
short-term speculative owners)

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“Profit more building Cat-2, rather than Cat-4 homes”

“Sell more materials in Cat-2, rather than Cat-4 home”

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Is standard bias due to…

… reward/penalty imbalance?

Reward from low standard

	Model Creators	Politicians	Interests	Consumers
	get standard out	development, jobs, tax base, affordability	more profit	perceived affordability
	none	minimal (blame Feds & climate)	none (some get more business)	bear cost (as owners/taxpayers)

Penalty from low standard

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Was Hammurabi right?

Do our system & standards have resilience accountability?

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Most-used arguments for low standards:

1. **Affordability**
2. **Probability**

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Affordability argument is fake

1. Studies show resilience investment pays 4-6x (NIBS)
2. No geographic correlation between stronger standards and affordability
3. Affordability depends more on demand/supply, land availability/cost and development restrictions than standards
4. Consumers spend **$300B annually** to renovate & remodel, mostly cosmetic
5. Consumers can trade-off size and cosmetic features, **if educated to value and prioritize resilience**

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Insurers use hazard probability to take smart financial risk

Should consumers/communities use probabilities to gamble life & property?

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10% Cat-4 chance in Tampa, so can profit charging 5% premium

10% Cat-4 chance in Tampa, so can save 5% living in Cat-2 development

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Should communities view high hazard events as probability and gamble with nature, or as certainty and set standards accordingly?

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Consumers in the dark & ignored

“No one told me my home couldn’t survive a Cat-4. Neither did anyone ask if I wanted one…”

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Standards setting system needs more public input, transparency & scrutiny and less developer/builder influence & fragmentation

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Who will educate consumer?

- Industry
- Government
- Professional Organizations
- Academics
- Non-profits

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Consumer Education Drives
last 50 years

- Auto Safety
- Energy Conservation
- Recycling
- Organic Foods
- Green Energy
- Sea Level Rise
- Climate Change

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Car Crashing

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Home Crashing

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Reversing the Standards Bias

Is society better-off

erring on weak or strong side

of resilience standards?

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Pathway to Resilience

1. Admit downward bias in standards
2. Recognize/address reward-penalty imbalance
3. Increase consumer & reduce industry influence in standards system
4. Educate consumer on being resilient-smart
5. Increase resilience transparency/data democracy

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Pathway to Resilience

6. Move from ‘escape’ to resilience standards
7. Make resilience, rather than risk-taking, affordable
8. Consistent standards for areas with similar hazards
9. Drive learning/cost curve and scale economies
10. Expose interests that push for low standards

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How can ASTM help move us on Resilience Pathway?

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Thank you!