Presentation prepared for:
Alaska Seismic Hazards Safety Commission

Uniquely Alaskan? Housing safety, regulation, and mechanisms for enhancing resilience

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Housing Resilience in Challenging Building Environments

Challenges to housing resilience in Lahaina, Maui (2024)

Resilient housing is foundational to communities worldwide, yet increasingly difficult to ensure availability.

Hazards and impacts are intensifying; multi-hazard environments exacerbate technical/engineering challenges

And technical solutions often ineffective if not used or improperly implemented. Social, political, and economic challenges must be "engineered" for as well.

How can we better foster housing resilience in Alaska?

We answer this question by way of three interconnected empirical efforts:

WHAT CHARACTERIZES HOUSING REGULATION IN ALASKA?
Qualitative multi-stakeholder study

DOES REGULATION WORK?
Observational building code compliance study

CAN WE DESIGN BETTER REGULATIONS AND ENFORCEMENT?
Seismic performance assessment to identify essential hazard-resistant features for housing

Damage in Eagle River from 2018 Earthquake

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Qualitative Multi-Stakeholder Study

What characterizes housing regulation in Alaska?

Snowball sample of everyone from homeowners to builders to designers to structural engineers and regulators. Interviews about housing resilience and Alaskan challenges reveal:

1. High degree of trust in building professionals and their ability to deliver hazard-resilient housing;

2. Many strongly prefer minimal or no government involvement; and

3. Building costs and poor-quality existing stock from certain periods are significant obstacles.

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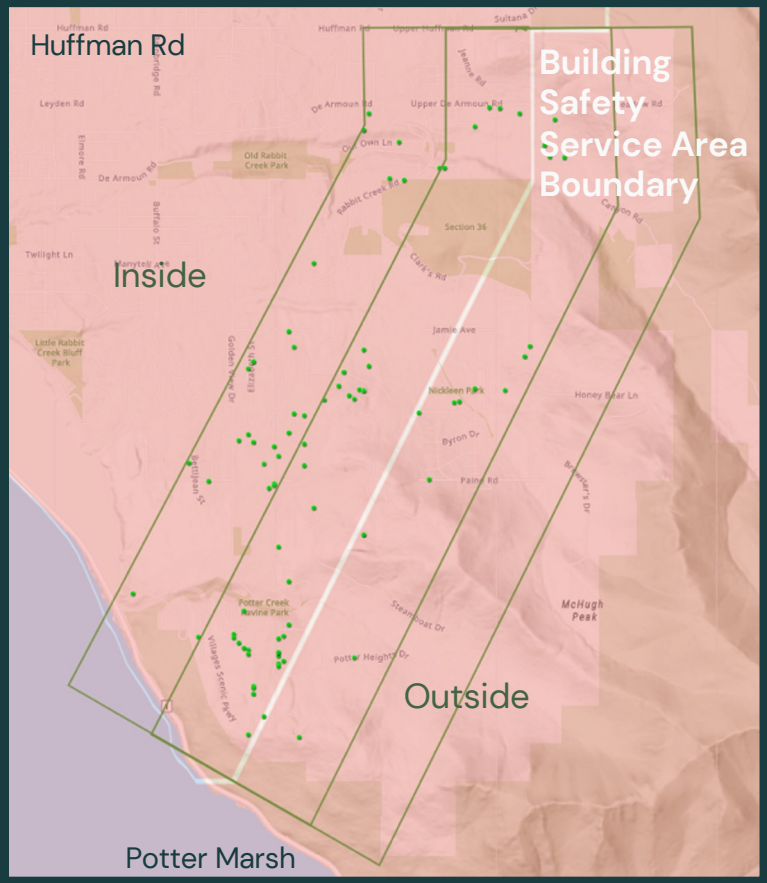
Observational Building Code Compliance Study

Does regulation work?

Anchorage Building Safety Service Area as natural experiment. Building code applies everywhere, so regulations remain the same, but plan review and inspection vary.

Census of all houses in Hillside area built between 2018 and 2023; also studied a group of new houses built throughout Anchorage by a single builder.

Balance tests suggest comparison is reasonable; lot size and housing value do not explain variation.



Anchorage Hillside area, showing boundary and census of 86 houses studied.

Methodology

Data from Building Department (ePlans)

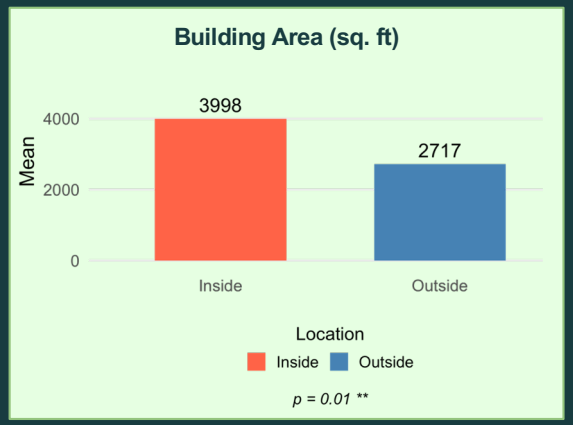
+

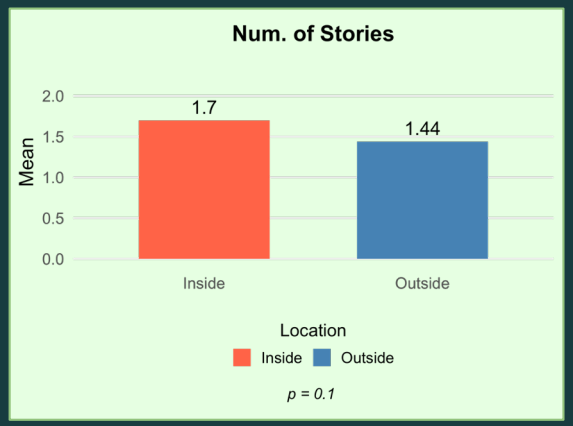
Measurement of Drone-Produced 3-D Images

Procedural Compliance *Results*

	Mean		T-Test
Variable	**Outside BSSA**	**Inside BSSA**	**Outside-Inside**
Plans Present	0.31	0.38	0.66
Structural Plans Present	0.00	0.33	0.00
Change Orders Present	0.00	0.15	0.01
Building Code Identified	0.00	0.23	0.00
Level of Structural Review (3rd Party)	0.50	0.87	0.30
Plans-House Differences (0-3 with 3 indicating very significant differences)	1.33	1.00	0.51
AHFC PUR 101 Present	0.31	0.28	0.79
Notice of Completion or AHFC PUR 102 Present	0.44	0.80	0.02

Engineering results show greater *complexity* inside





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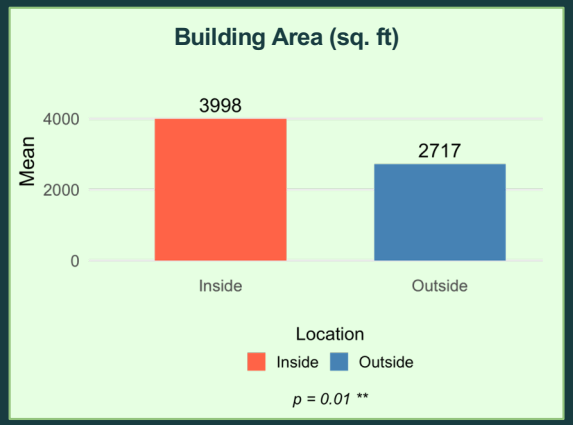

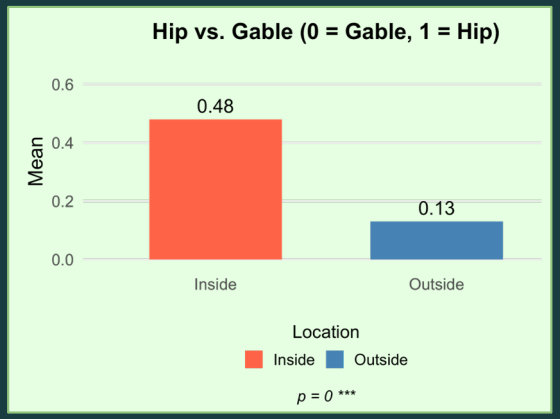

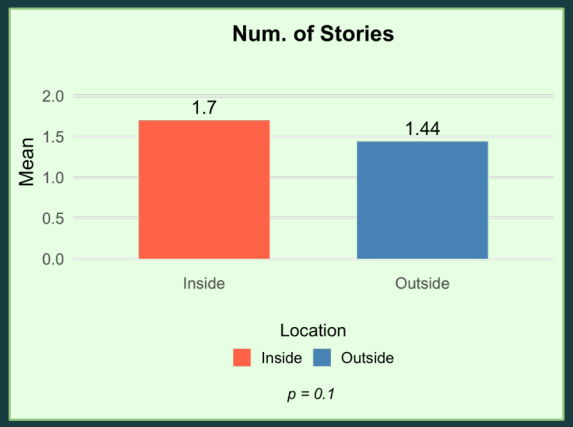

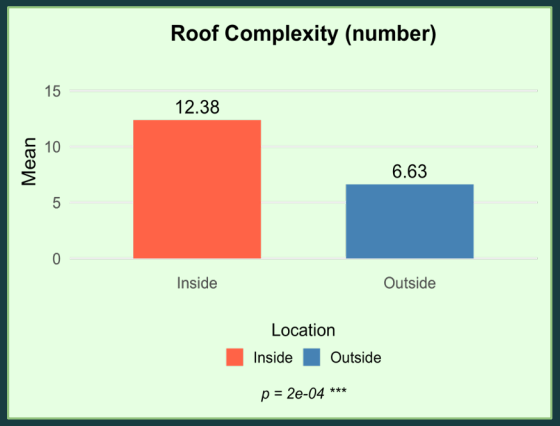

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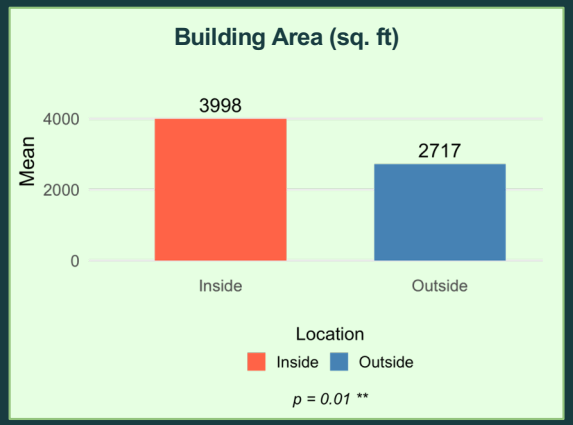
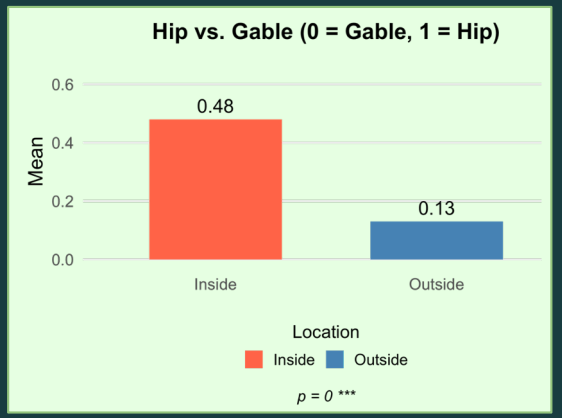
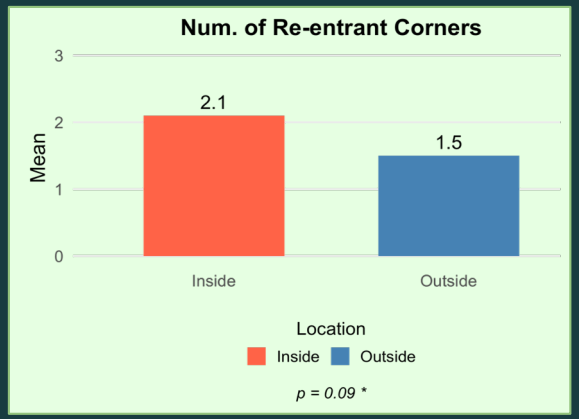
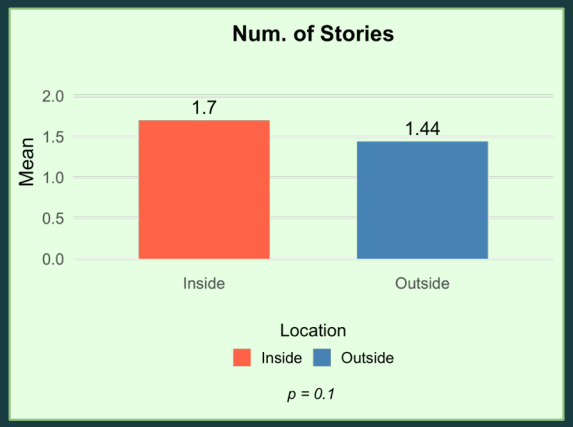
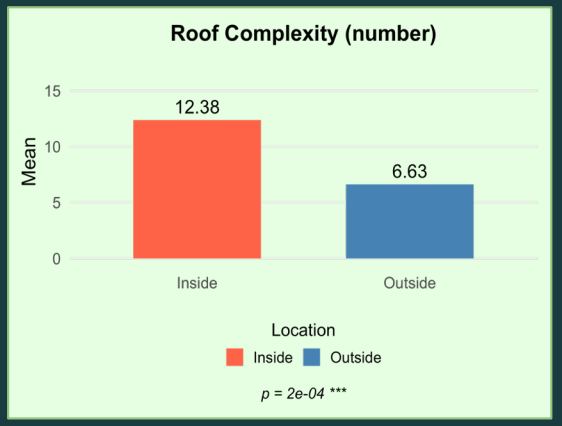
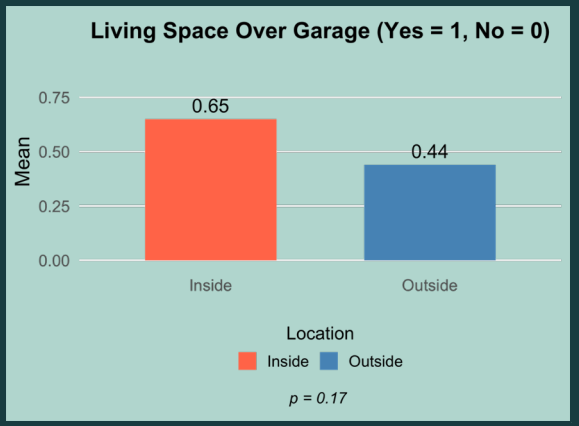




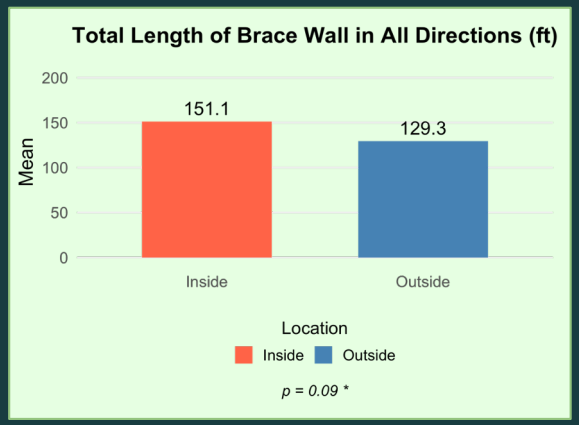


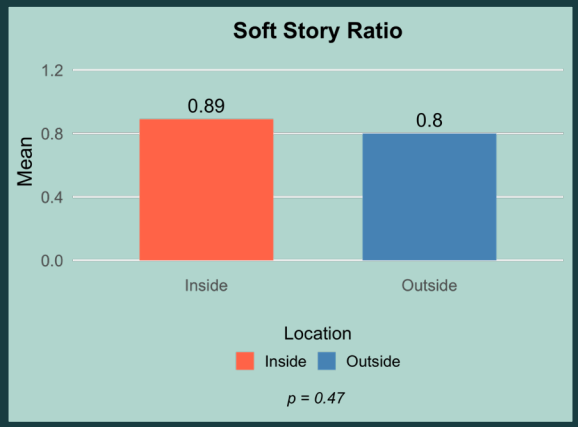


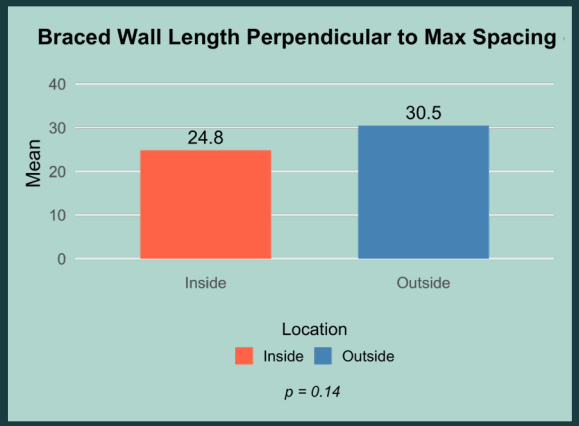


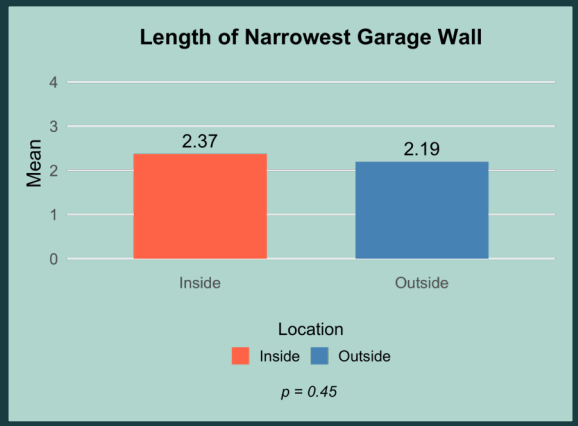


Complexity and other metrics may indicate more engineering inside









Potential Mechanisms

★ **Liability/Risk Aversion:** absence of city sign-off means structural engineers and builders are solely responsible for building failure.

RESULT

conservative design choices where more limited regulation

★ **Collaboration:** interaction with building department officials fosters confidence.

RESULT

more complex design choices where there is more regulation

Some Evidence to Support the Liability/Aversion Hypothesis

Lawsuits + Social License Pressures

Lawsuits are costly. Earthquake insurance is not extensively carried in Alaska. If a house requires costly repairs or demolition, homeowners may sue.

But, even absent lawsuits, market actors sometimes comply anyway.

Gunningham, Kagan & Thornton (2006) find that businesses and prominent individuals sometimes go beyond compliance, even when it is costly for them. The authors argue that they do so because of reputational concerns: they do not want their social license (which they enjoy the benefits of) to be taken away.

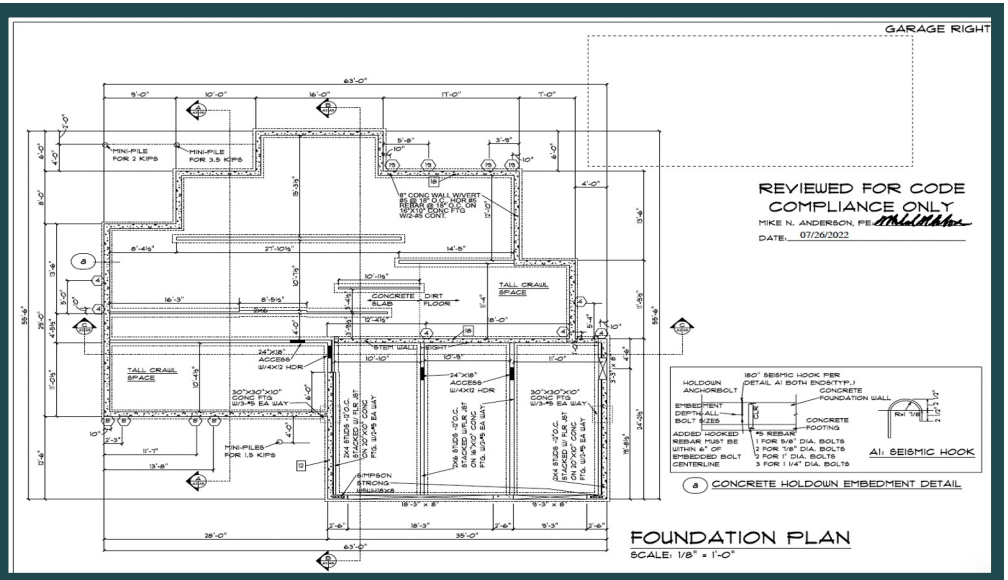
Our qualitative data show that many building professionals believe that this social license pressure is ensuring that people are doing the right thing.

Some Evidence to Support the *Collaboration Hypothesis*

Design/Engineering by Review

Qualitative follow-up interviews reveal that some building professionals use the regulatory process to guide their design choices (making their work more efficient).

There is also evidence to suggest that professionals that are new to the area are socialized to local concerns and design by Building Department staff



Building Science Projects

Other interviewees suggest that the Building Department review process strongly influences development and documentation of non prescriptive design solutions; whether this is essential or onerous is subjective and varies by respondent.

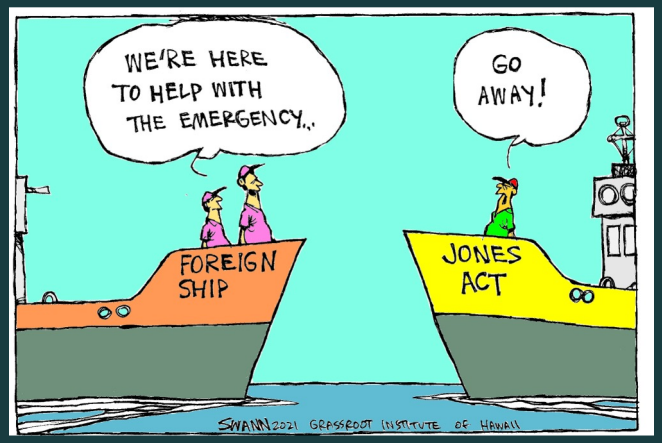
Putting Housing Regulation in Alaska into Comparative Perspective

In ***Alaska***, housing regulation is highly uneven and, while housing stock is ***not necessarily safe***, many think it is; housing is also ***very costly***, even though code compliance is relatively quick (where it is required).

In ***Hawai‘i***, the regulatory state is ***robust***, particularly with respect to housing; the housing stock is ***relatively safe*** and people perceive it so, but housing is ***very costly*** and building new code compliant housing takes a ***long time***.

What explains the politicization of housing regulation in both locations despite very different regulatory frameworks?

It's the Economy Stupid.



In both cases, *high housing costs* are perceived to be a sign of ***over-regulation***.

We argue that this is a case of *misplaced causality* on the part of the public, driven in part by the fact that *effective regulation is not readily visible*.

High costs in both locations are driven largely by other factors, including ***shipping costs***, ***labor scarcity***, ***inflation***, etc.:

- The **Jones Act** is a significant contributor to shipping costs and therefore housing costs.
  - ***Shipping regulation*** *is to blame, not the building code!*
- Inflation of *material costs* and *labor prices* has dramatically raised costs in Alaska and Hawai'i (and elsewhere).
- ***Land scarcity*** (proximal to infrastructure) is an issue in both and contributes to high costs.

Regulation Rocks!

Evidence suggests that ***regulation*** does foster *housing safety* and *resilience*. In addition to data from the 2018 Anchorage earthquake:

There is evidence that adherence to building codes is associated with ***reduced damage in hurricanes*** (Florida, South Carolina, etc.);

And FEMA's Building Codes Save study shows ***large economic benefits*** accrue those who ***adopt building codes***.

Table ES-2: Average Annualized Losses Avoided by Hazard

Hazard	No. of Bldgs. Modeled[1]	AALA (x$1,000)
Flood	786,473	$483,602
Wind	9,200,267	$1,060,692
Seismic	2,441,923	$59,924
	Total AALA	**$1,604,218**

Policy Implications

Demonstrably unsafe housing isn't actually affordable housing. Consumers want both. ***Regulatory Pragmatism*** is important in terms of determining how to proceed.

*Any entity seeking to **foster housing resilience** through regulation can do so, but it must:*

1) Make the benefits of regulation more apparent to consumers;

2) Simplify/clarify the regulatory requirements and process;

3) Simultaneously enact policies that mitigate those factors that are causally connected to high housing costs.

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