



# Existing Commercial Buildings and the Energy Code: An Illinois Enforcement Study

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# Code Official Survey

## *Background*

- Vast majority of energy use (and savings) are in existing buildings
- Modifications that increase energy use or replacement of regulated building components must comply with energy code

# Code Official Survey

## Background

- In-field conditions may make compliance excessively costly or technically infeasible
- IEBC Section 104.10: “Wherever there are practical difficulties involved in carrying out provisions of this code, the *code official* shall have authority to grant modifications for individual cases”
- Variance – deviation from code requirements

# Code Official Survey

## *Objectives*

- Assess how the commercial chapter of the 2015 IECC is understood and enforced in existing building alterations, renovations or retrofits
- Understand how often variances to the energy code are requested and granted for these projects
- Identify main reasons why variance requests are made and granted

# Methodology

## *Survey Design*

- 10-15 minute anonymous survey
- Distributed to code officials in IL
- Three Sections to Survey:
  - Qualifying questions
  - Permitting differences in building components:
    - Roof replacements
    - Exterior wall modifications
    - Window modifications
    - Lighting alterations
    - HVAC system alterations
  - Feedback: Useful tools/guidance for enforcement
- Results collected over 1 month

# Qualifying Questions

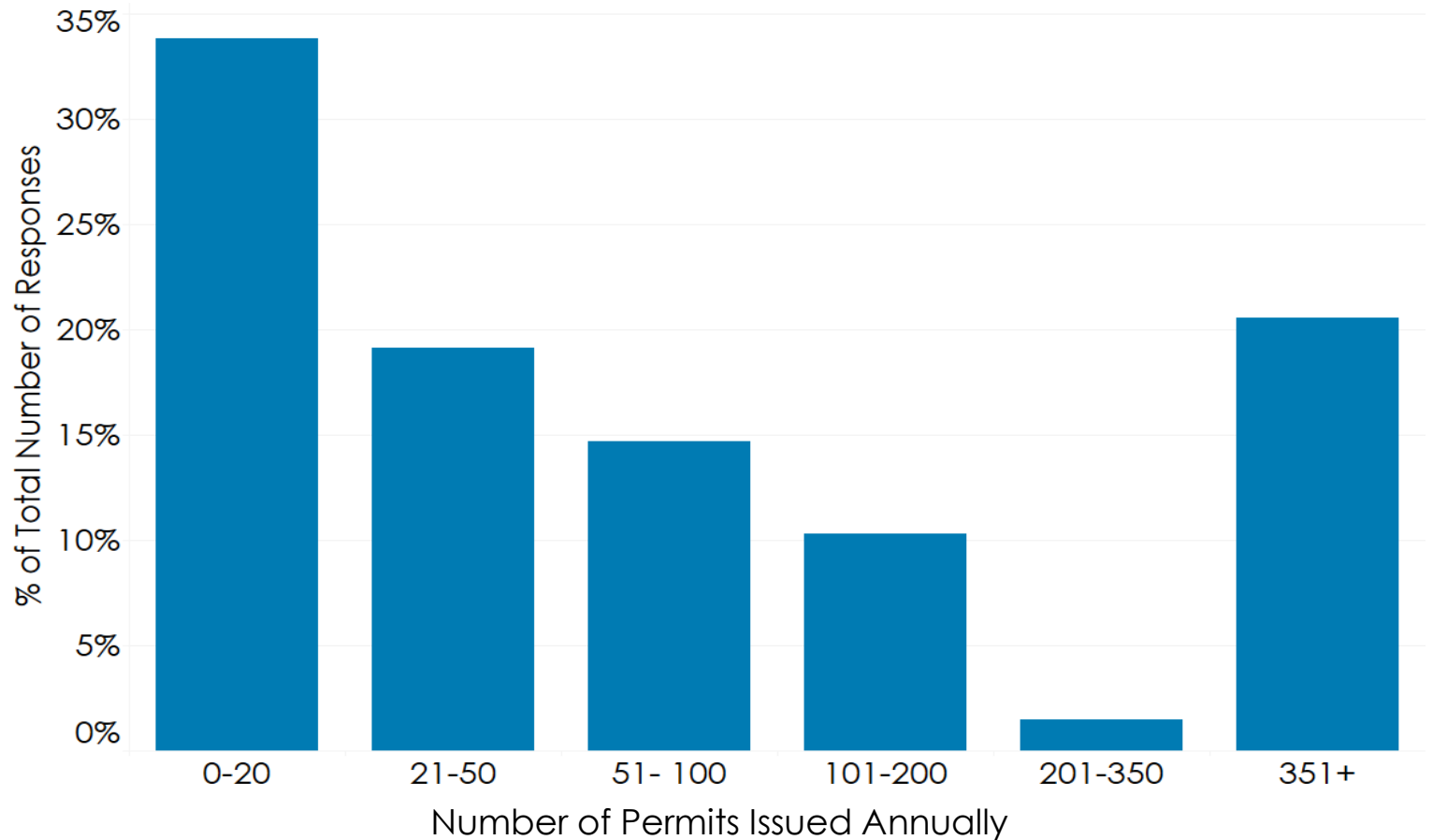
# Findings

## *Qualifying Questions*

- 69 Code Officials Responded
- Mainly working in CZ 5, with some working in 4, and some in both 4 and 5
- All directly involved in enforcement of commercial energy code
- 75% said enforcing energy code in existing buildings is important or extremely important

# Findings

## *Annual Permits Issued*



60% stated that existing building permits made up over 71% of total permits issued



# Findings

## Permits Required by Project Type

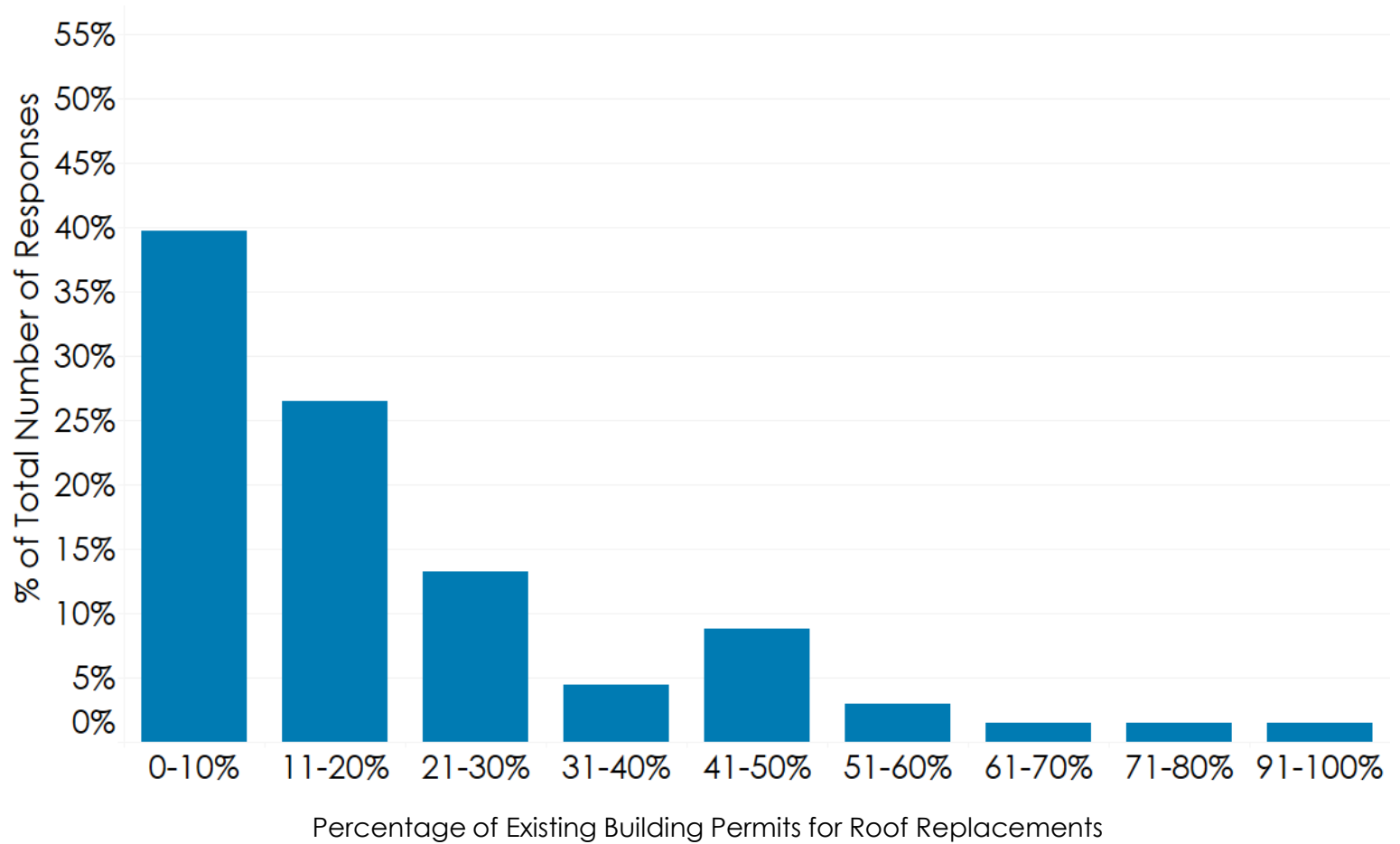
Project Type	Requires Permits	Does Not Require Permits
Roof Alterations	94.12%	5.88%
Exterior Wall Modifications	97.01%	2.99%
Window Alterations	82.26%	17.74%
Lighting Alterations	80.33%	19.67%
HVAC Alterations	86.44%	13.56%

# Differences in Permitting

## Breakdown by Building Component

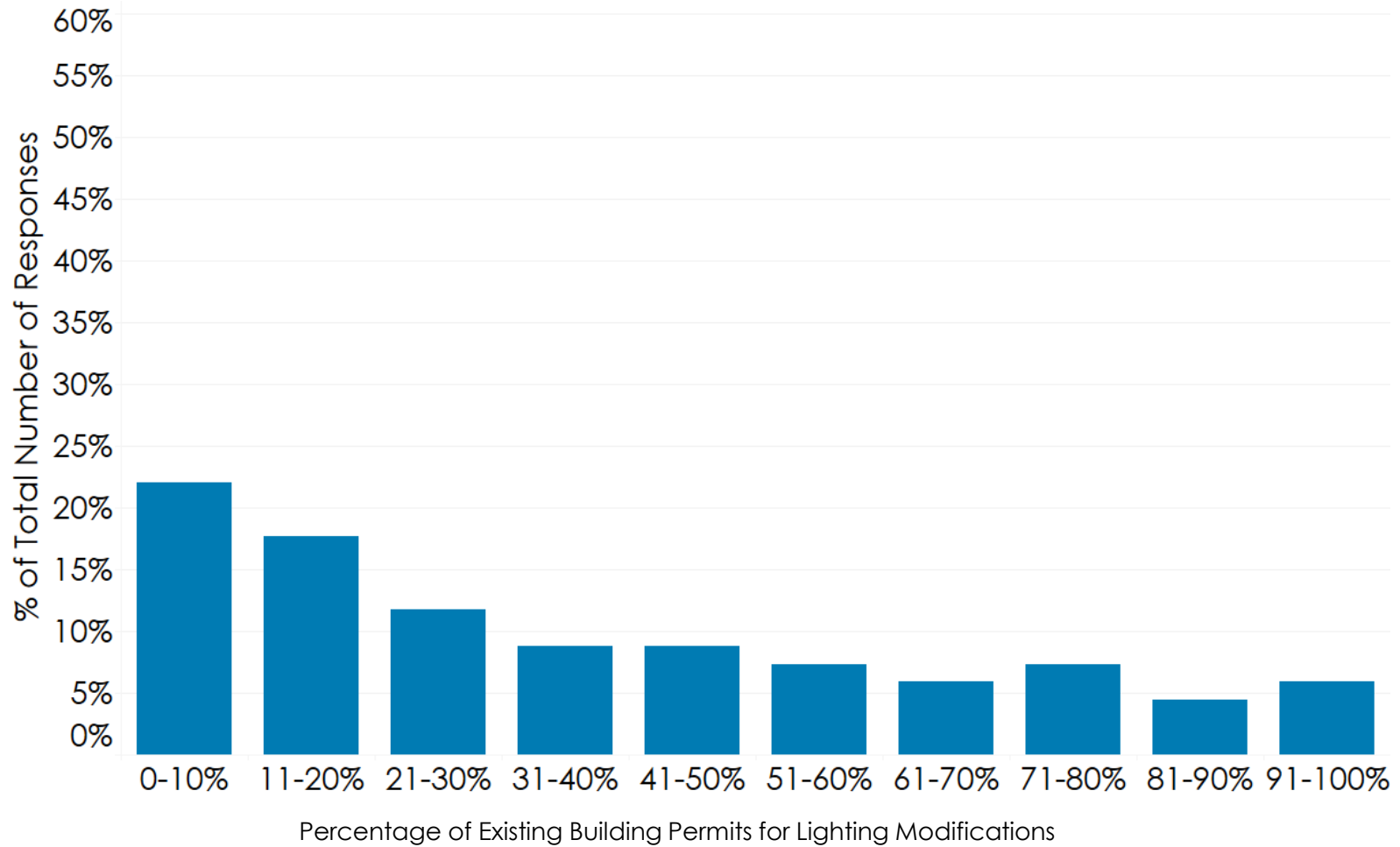
# Findings

## Roof Replacement Permits



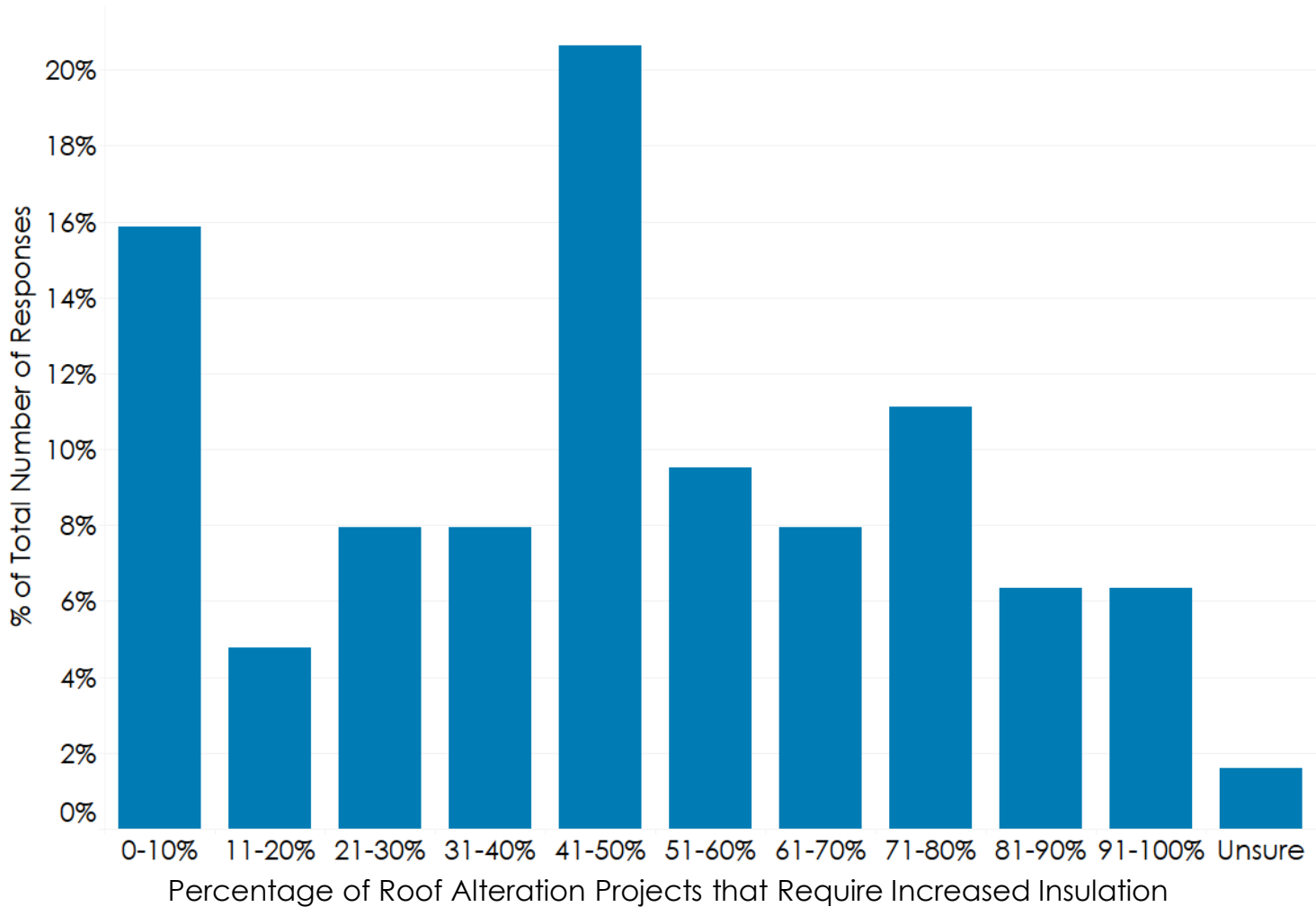
# Findings

## *Lighting Modification Permits*



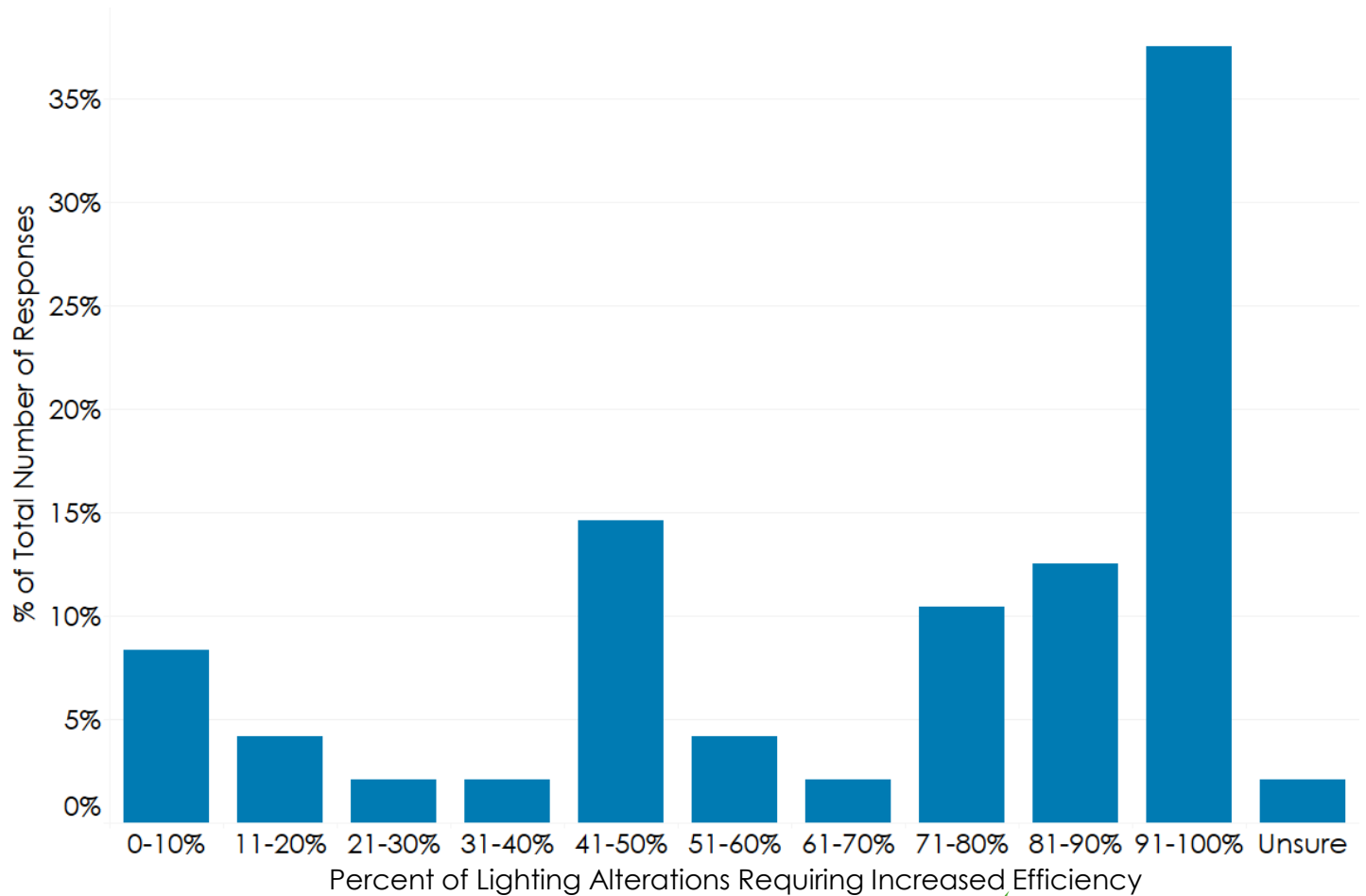
# Findings

## Roof Alterations Requiring Efficiency Updates



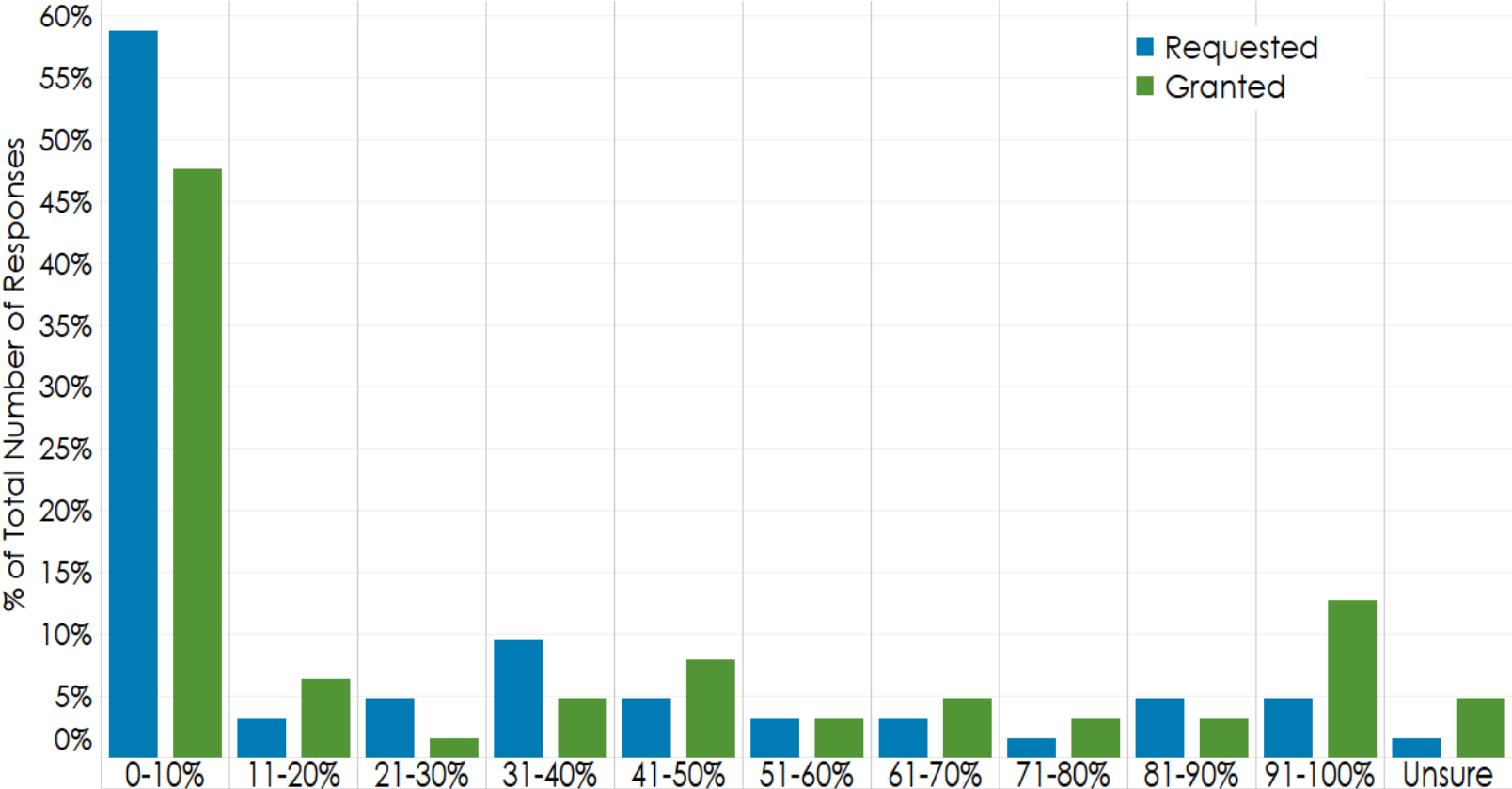
# Findings

## Lighting Modifications Requiring Efficiency Updates



# Findings

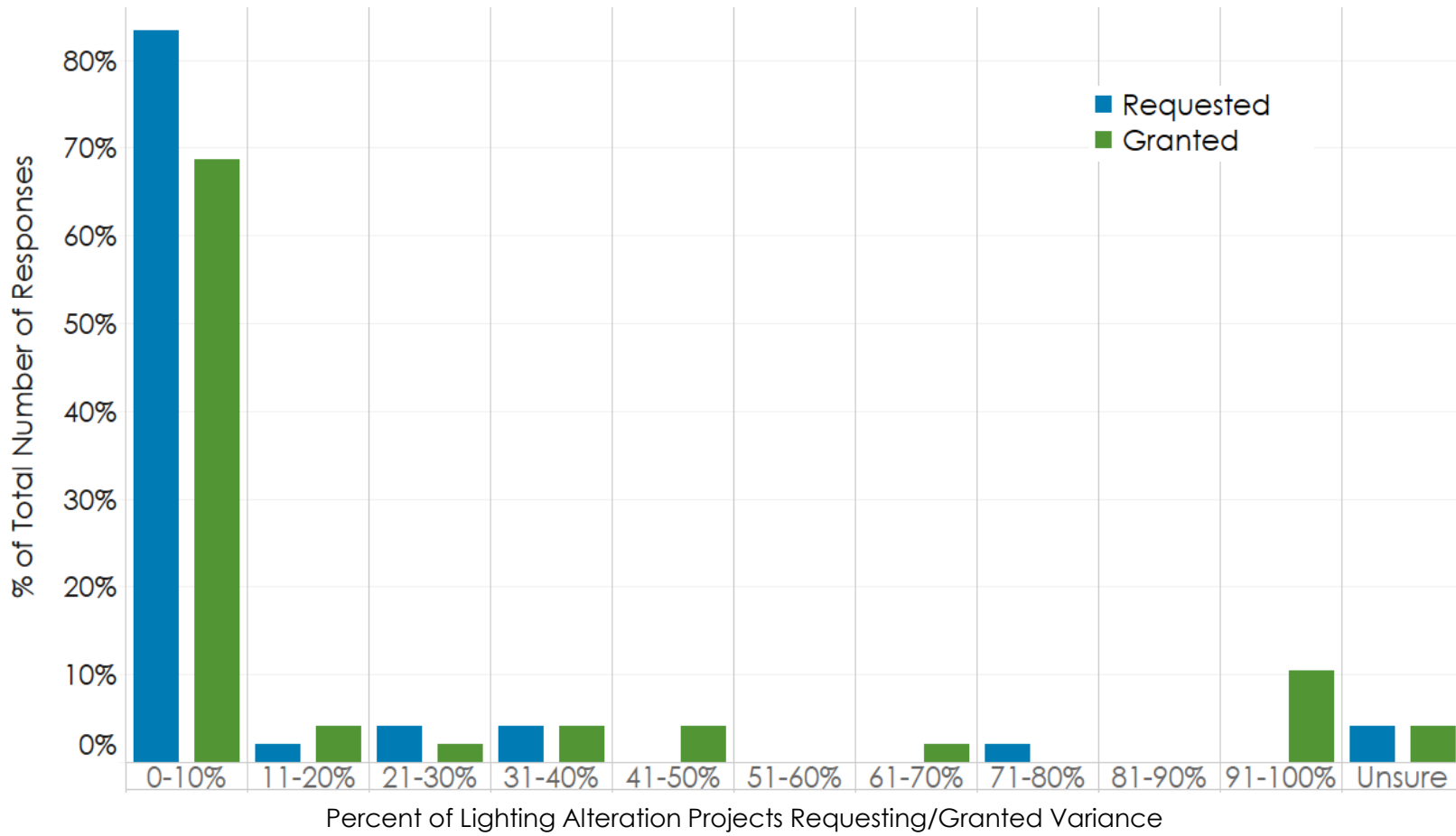
## Roofing Variance Requests



Percent of Roof Alteration Projects Requesting/Granted Variance

# Findings

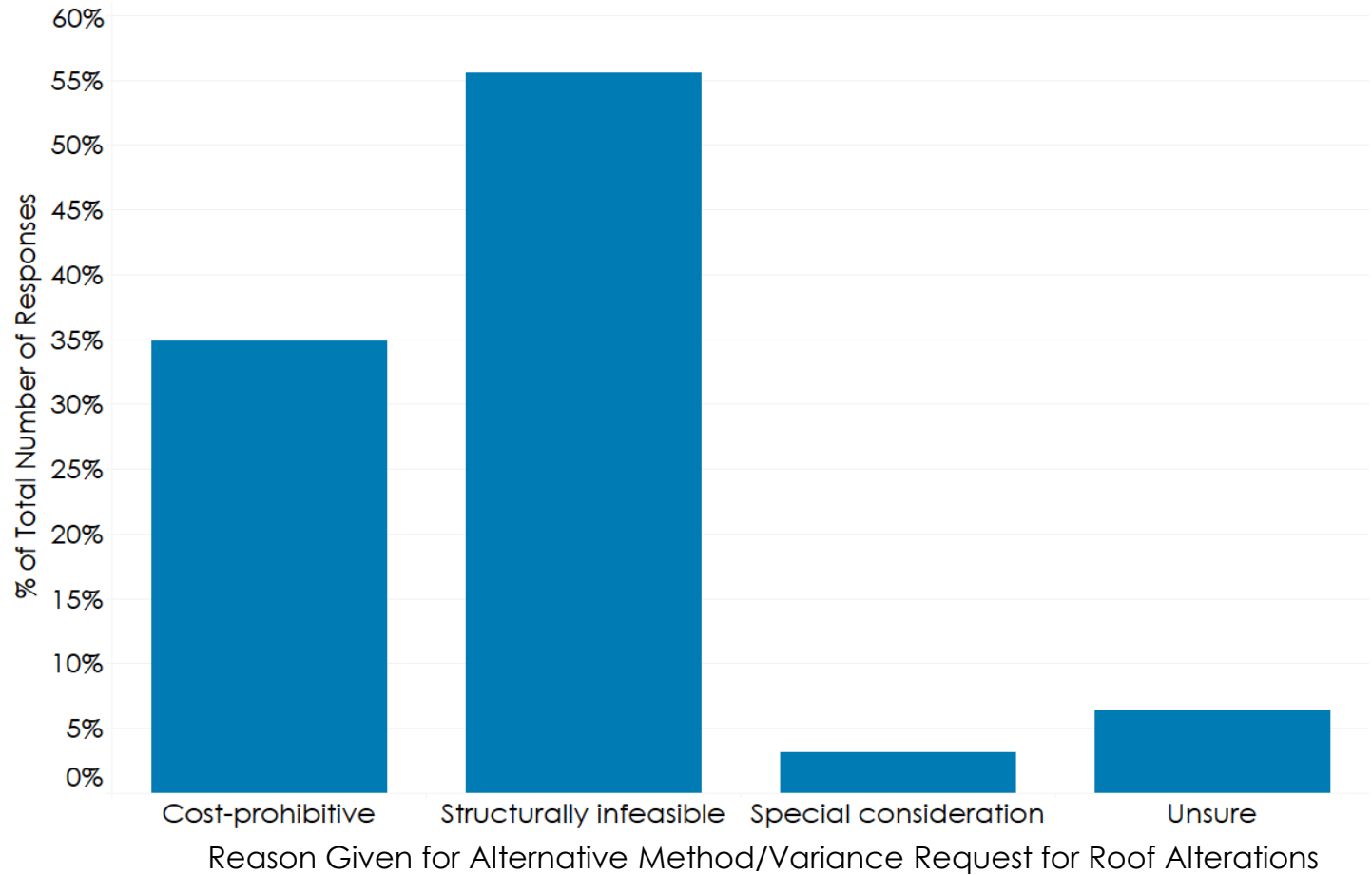
## Lighting Variance Requests





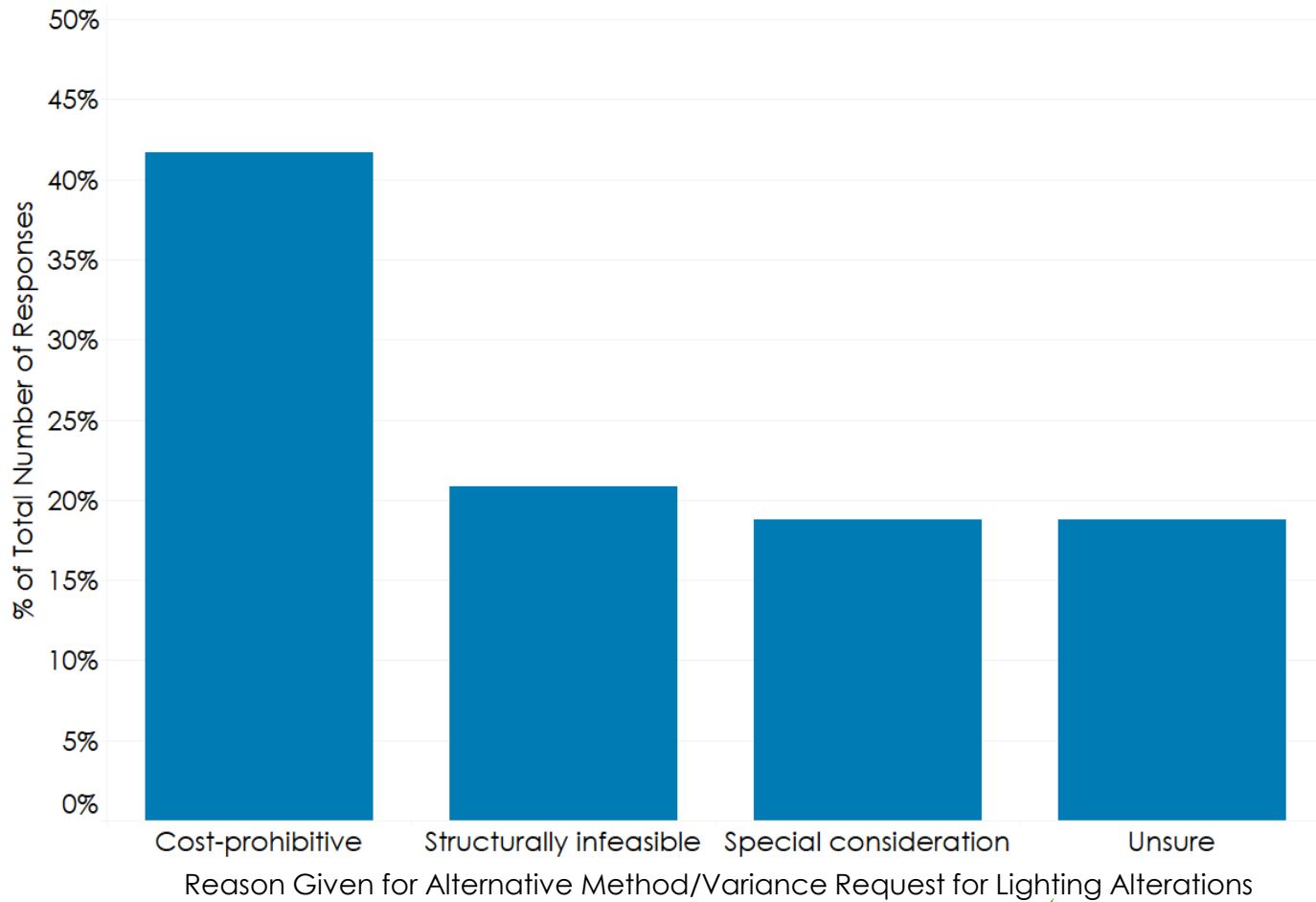
# Findings

## *Reason for Requesting Roofing Variance*



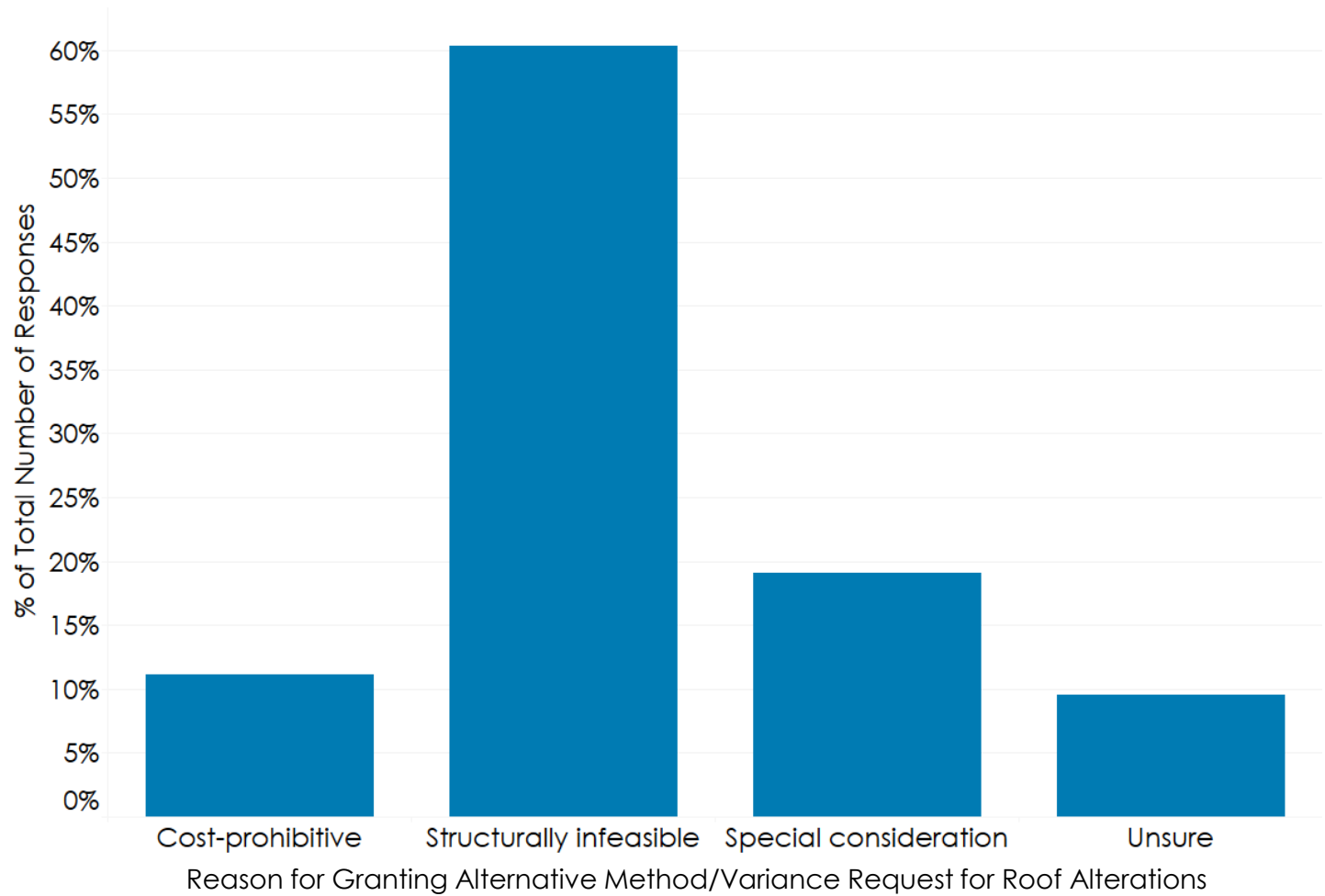
# Findings

## Reason for Requesting Lighting Variance



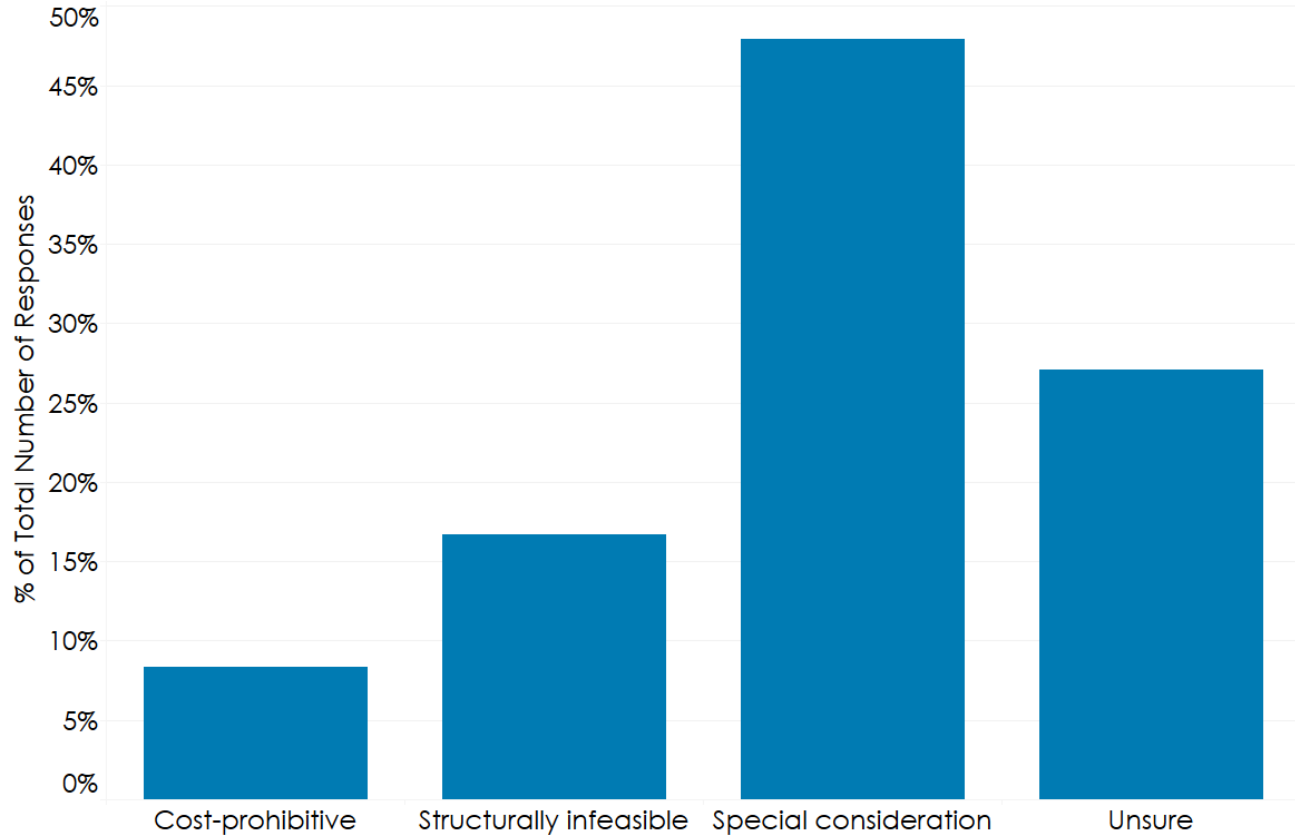
# Findings

## *Reason for Granting Roofing Variance*



# Findings

## Reason for Granting Lighting Variance



Reason for Granting Alternative Method/Variance Request for Lighting Alterations

# Findings

## *Differences Between Building Components*

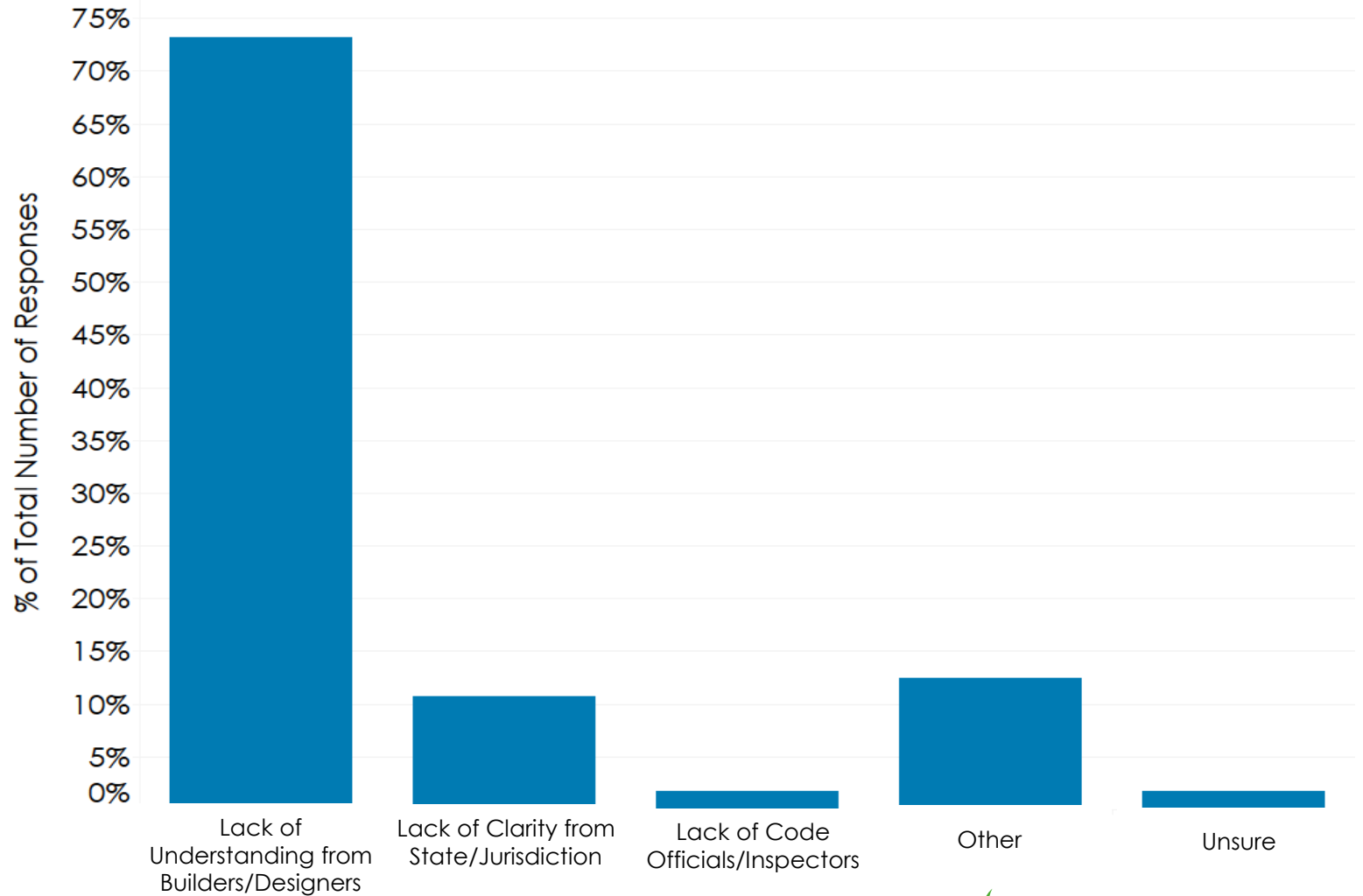
- Fewer permits were issued for modifications to building thermal envelope than lighting and HVAC alterations
- Projects to modify windows, lighting and HVAC often required improving the level of efficiency
- If variances were granted for window, lighting, and HVAC alterations, they were because of special considerations given due to overall compliance

# Code Official Feedback

## Enforcement

# Findings

## Biggest Enforcement Issue



# Findings

## *Additional Trainings and Guidance*

- 59% expressed interest in receiving ICC certified trainings on energy code compliance
- Some thought more clarity written into the code and additional guidance about variances would be beneficial
- A few suggested real-world examples would be helpful when applying commercial energy code to existing buildings



# Findings

## *Additional Code Official Thoughts*

- The energy code is not enforced uniformly across jurisdictions
- Some code officials are more lenient than others about energy code requirements
- Some code officials see the energy code as unrelated to matters of public health and safety

# Conclusions

## *Key Findings*

- More permits issued for lighting and HVAC modifications than changes to building thermal envelope
- Builders and designers rarely request a variance to the energy code
- Requests for variance are rarely granted
- Primary challenge to enforcing energy code was lack of understanding by builders/designers

# Next Steps

## *Future Activities*

- Possible training opportunities for code officials and builders/designers
- Work with ICC to include more clarity around variances and existing buildings in code commentary
- Guidance from state interpretation
- Guidance from collaborative

**Questions?**

Thank you!

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