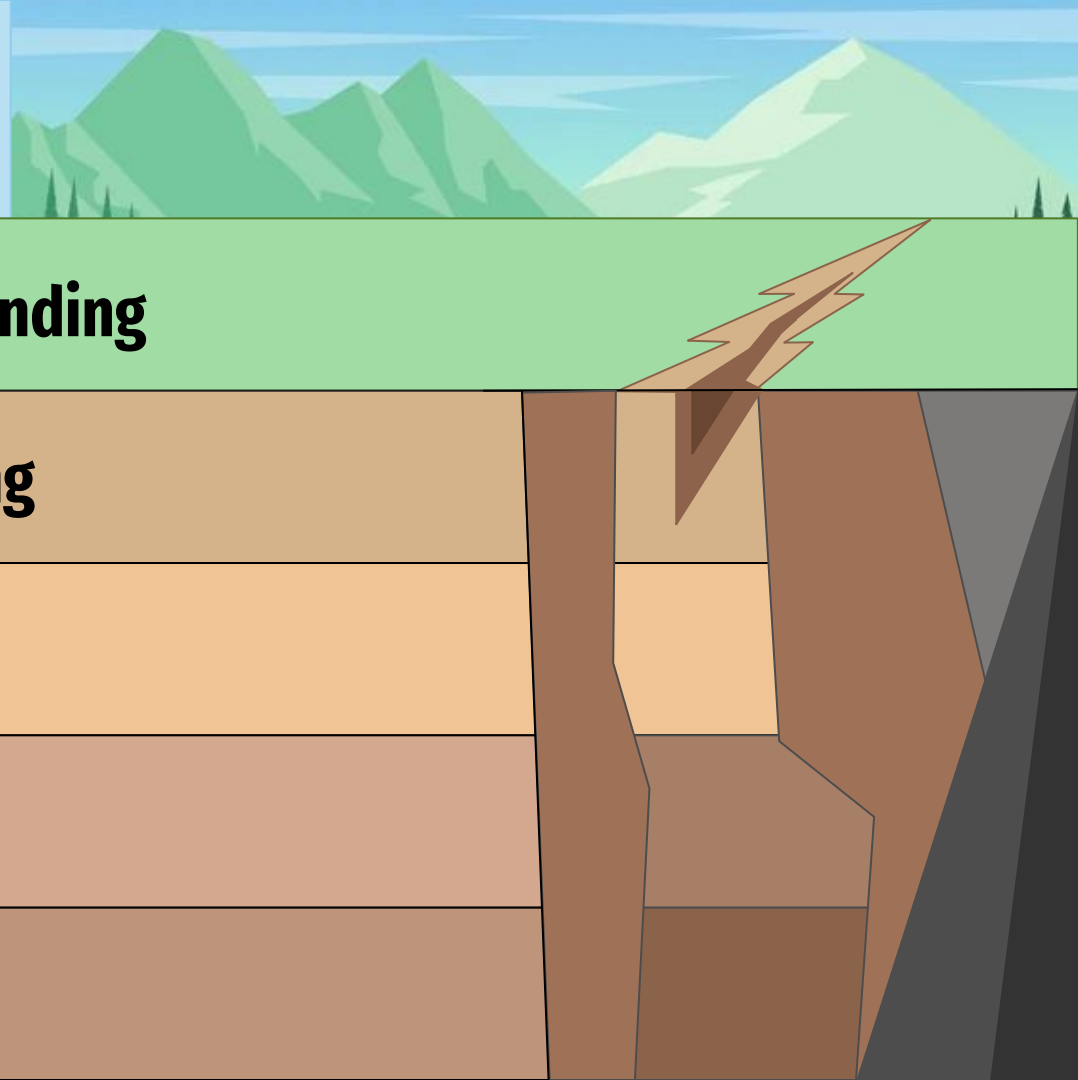
Predicting Earthquake Damage in Nepal

By Michael Lee

Agenda



- Business Understanding
- Data Understanding
- Findings
- Recommendations
- Future Research

Business Understanding

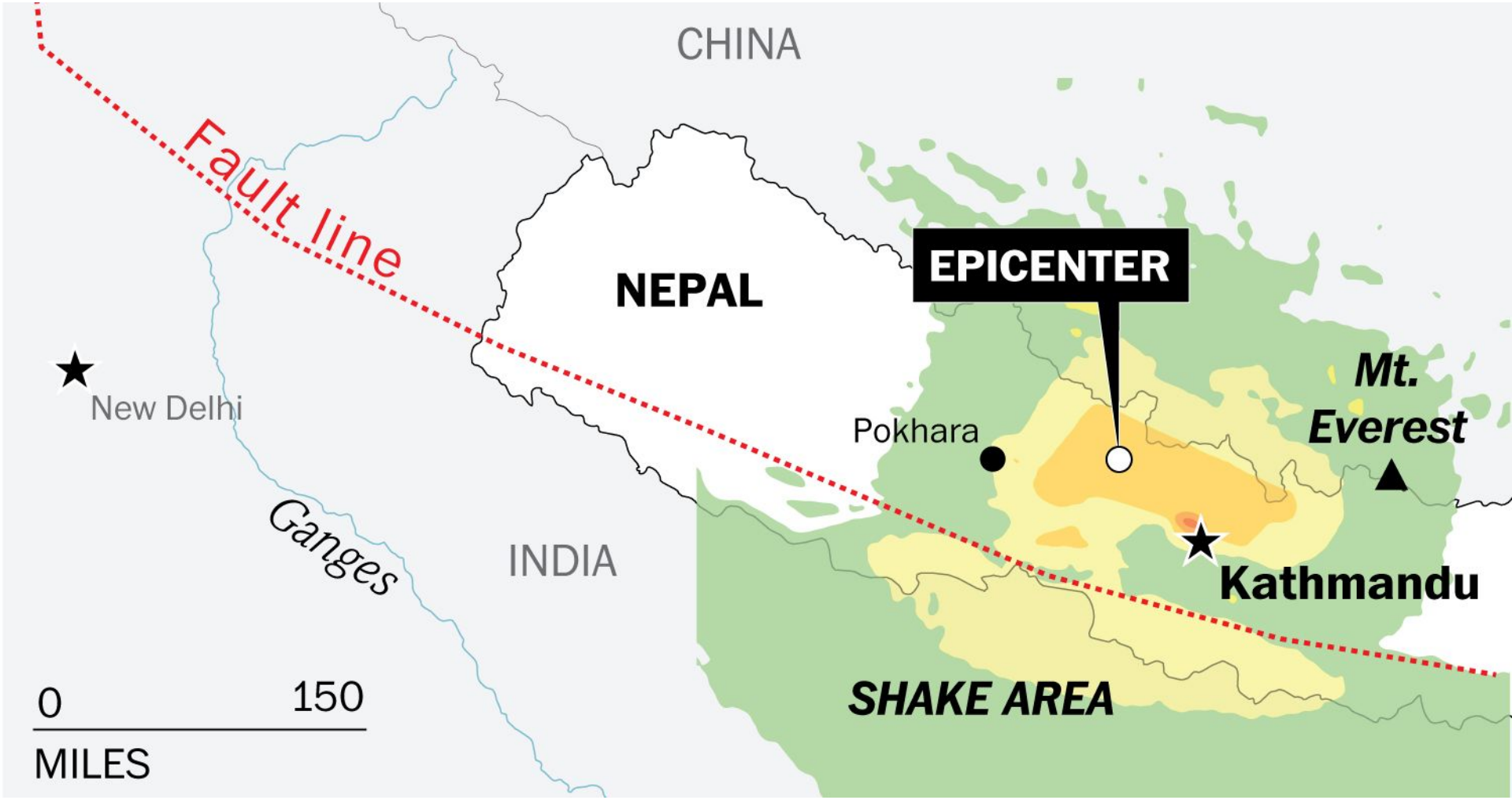
Unexpected Earthquakes

Minimize Damage

Model Damage Predictor

Based on building characteristics

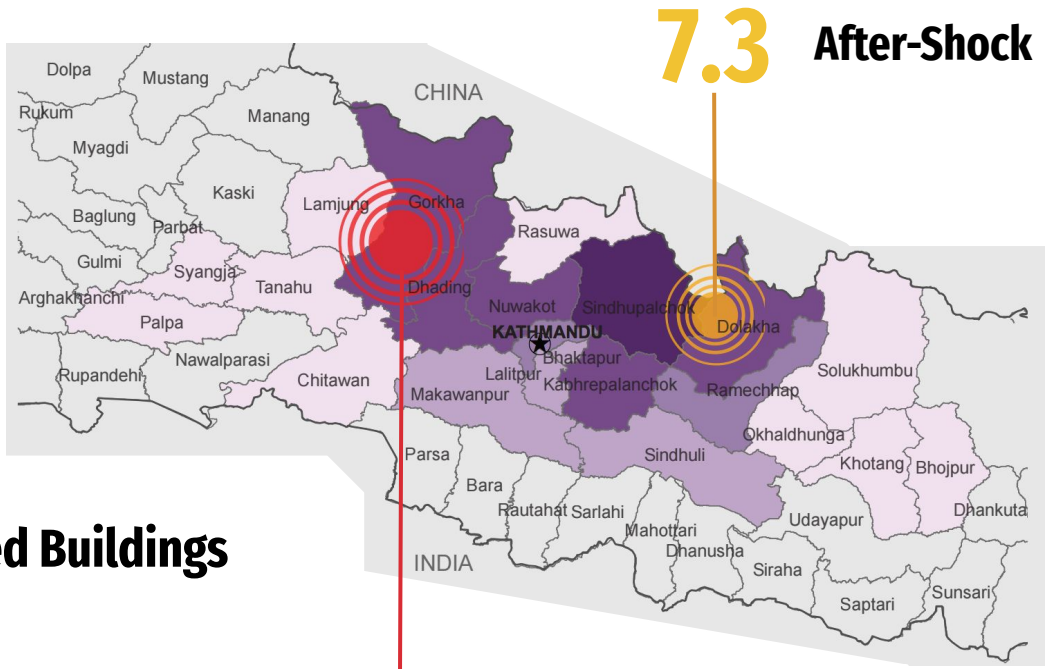
What's Important?


CHINA
Fault line
NEPAL
EPICENTER
New Delhi
Pokhara
Mt.
Everest
Ganges
INDIA
Kathmandu
SHAKE AREA
0
150
MILES

Data Understanding

Nepal Earthquake - 2015

Two Major Earthquakes Within 3 Weeks of Each Other

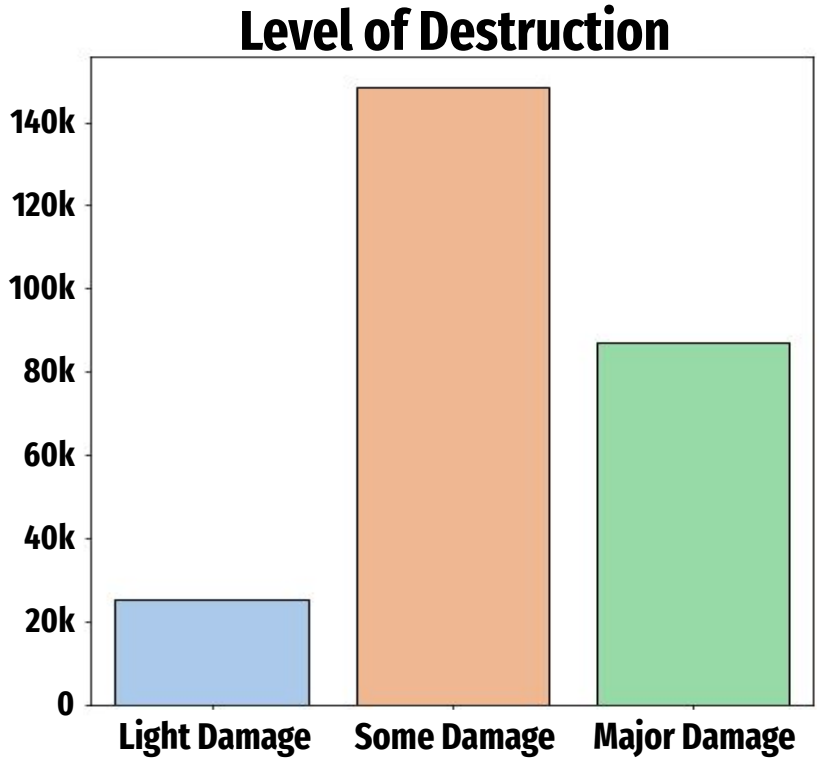


260K Damaged Buildings

3,677,173 Individuals Affected

70% Accuracy

Data Understanding



10 %

Light Damage
Minor Repairs

57 %

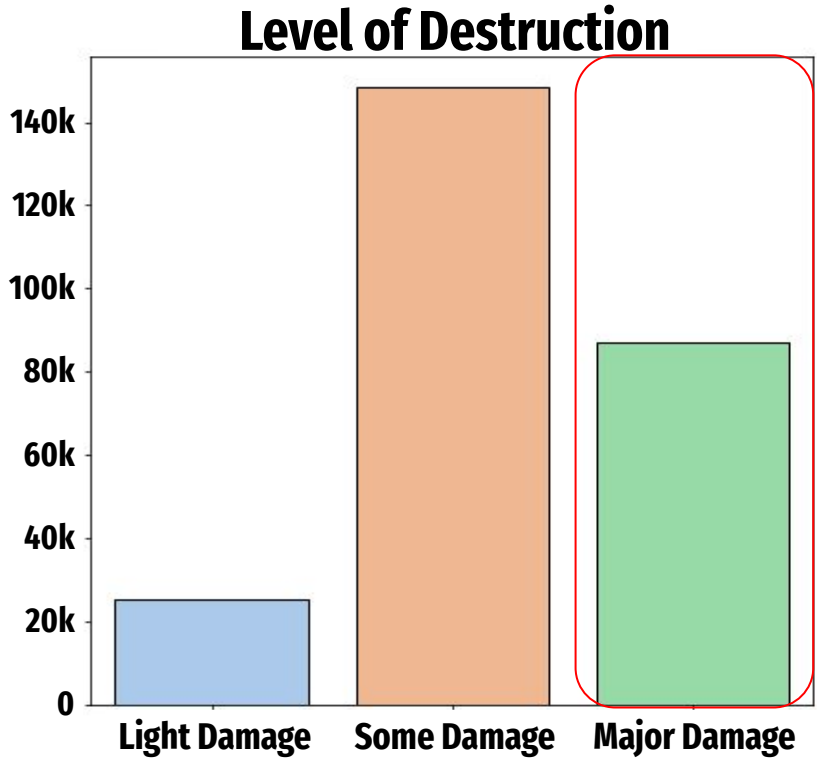
Some Damage
Moderate Repairs

33 %

Major Damage
Almost Complete Destruction

Data was sourced from the 2015 Nepal Earthquake Open Data Portal. **For more info, click here**

Data Understanding



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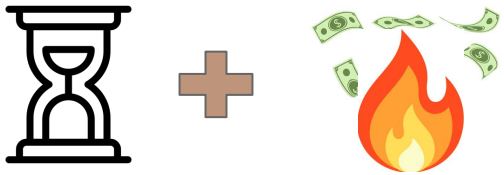
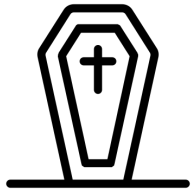
Finding Balance

False Positives



False Negatives



Accuracy

Modeling Features (Some)

01 Height

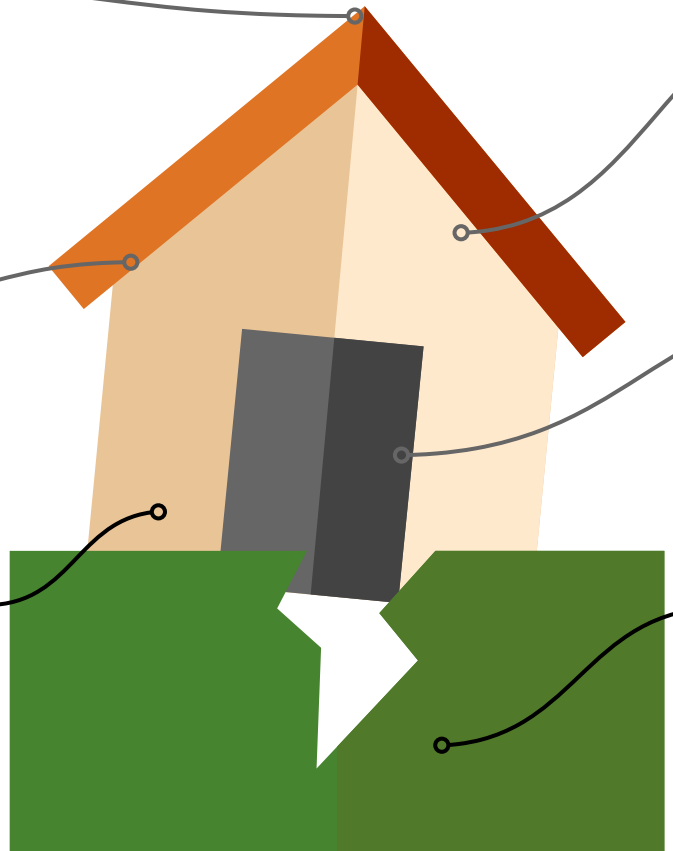
02 Building Age

03 Roof Type

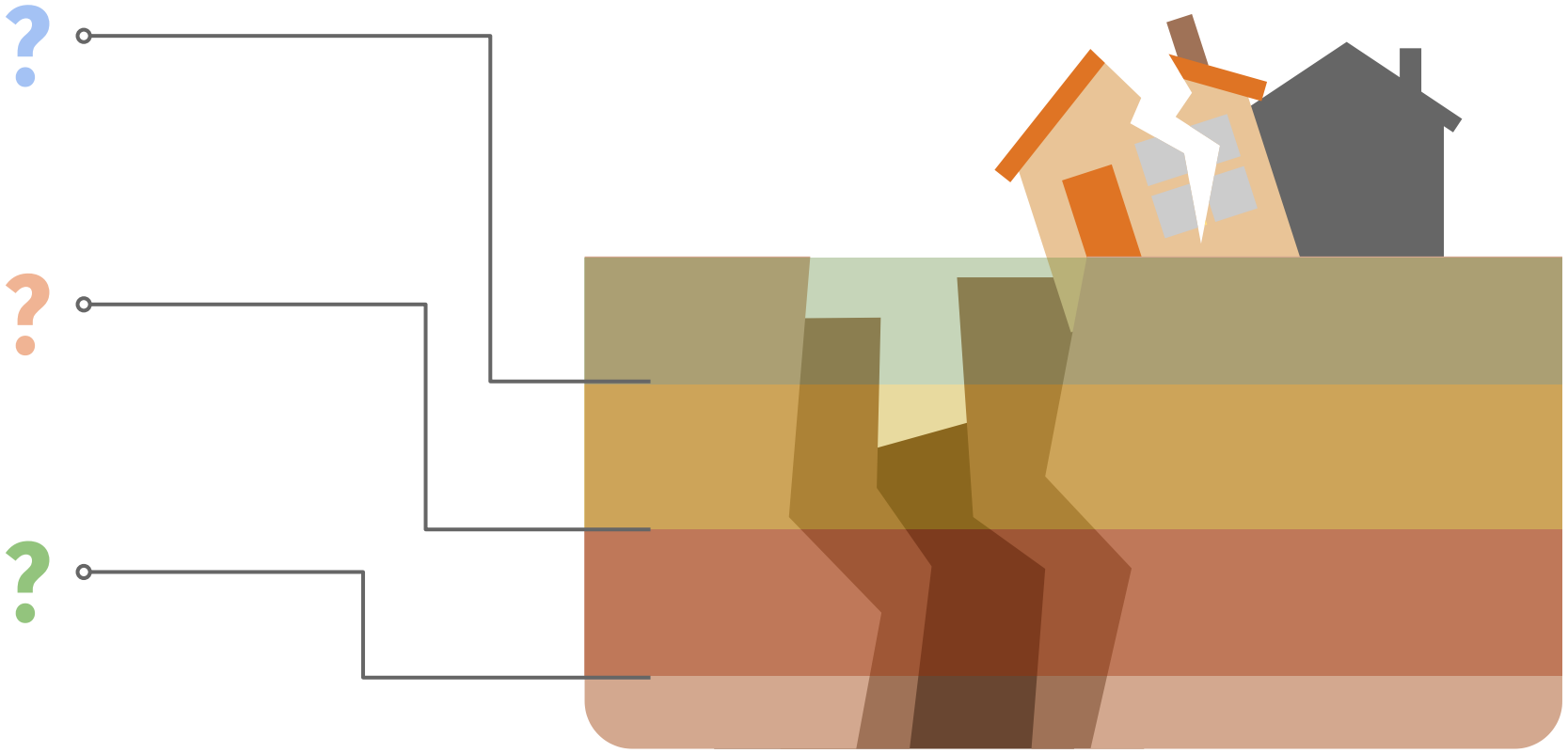
04 # of Floors

05 Superstructure

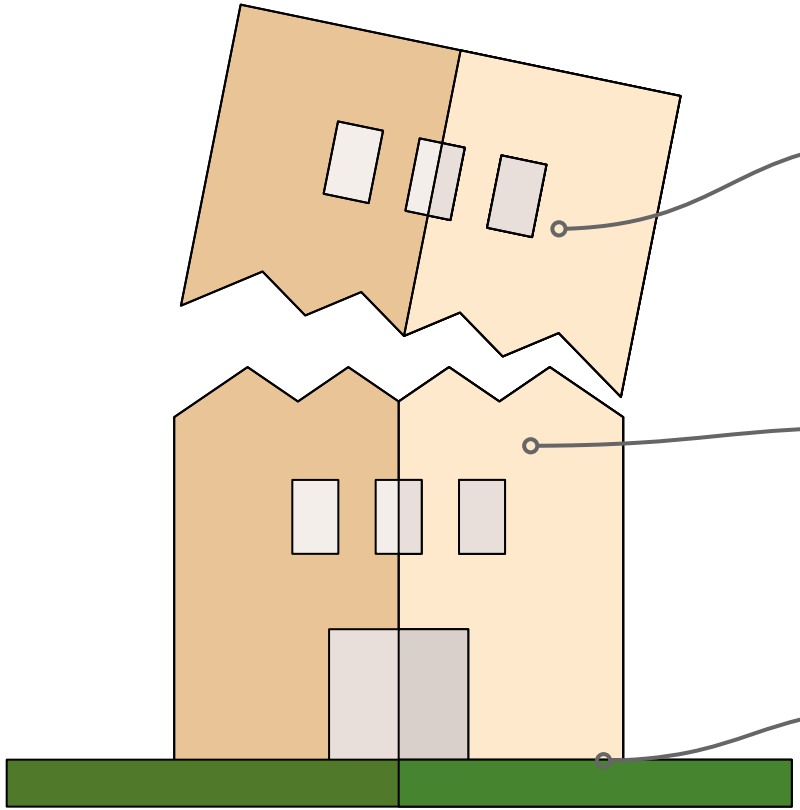
06 Foundation Type



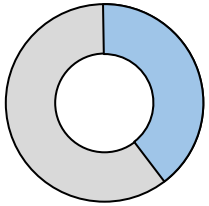
Findings



Buildings That Were...

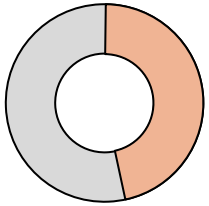


40 %



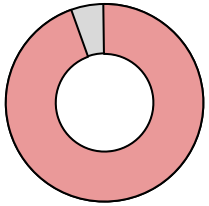
> 25 Years Old

46 %



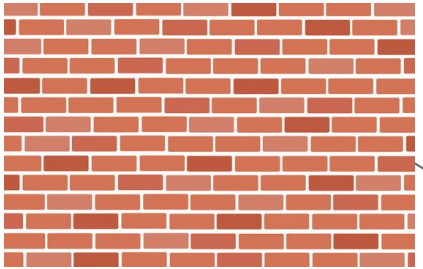
Tall with Small Base

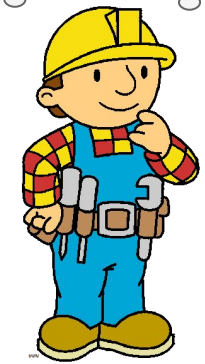
95 %

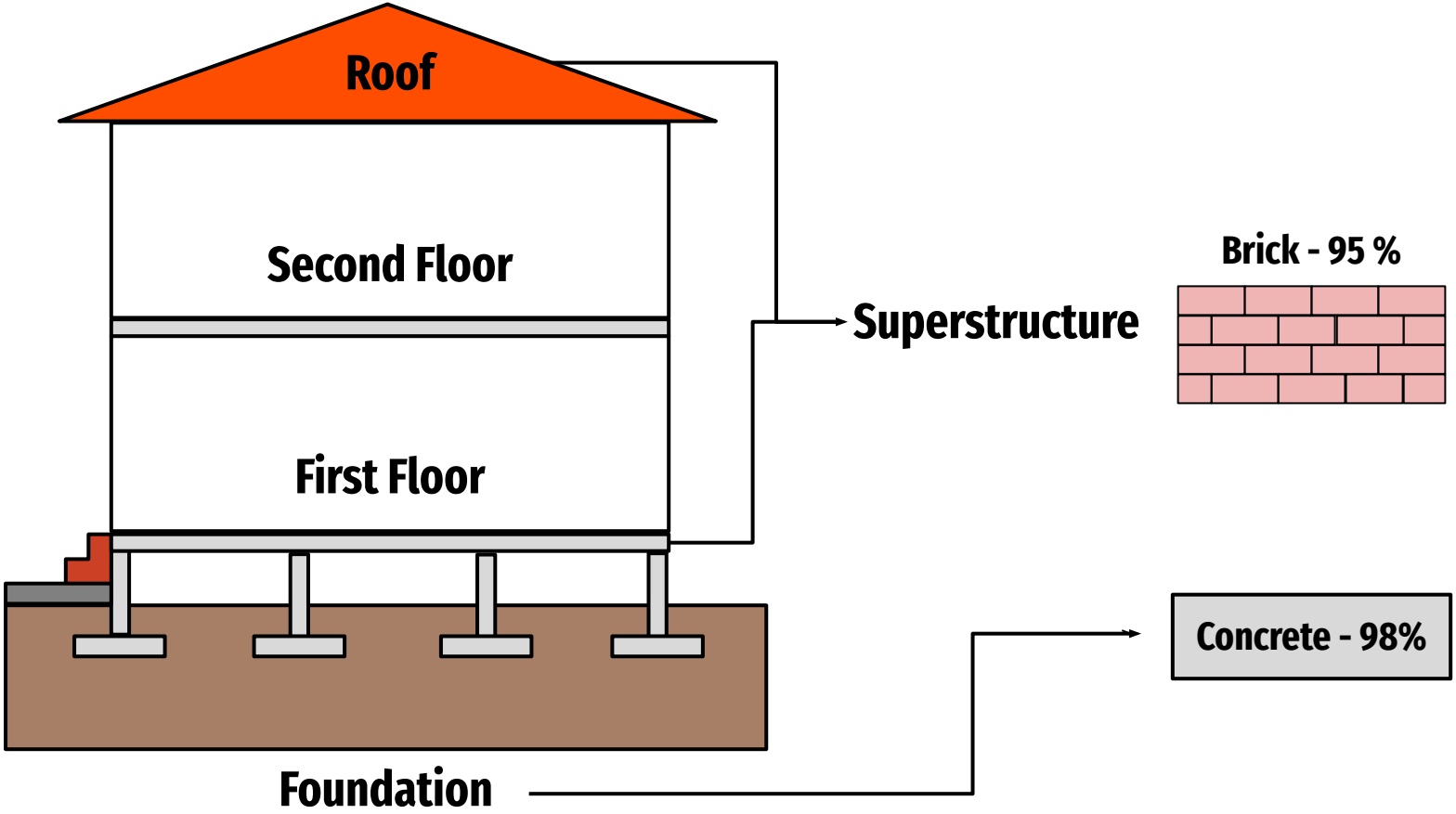


Lacking Strong Foundation

Foundation, Foundation, Superstructure?!

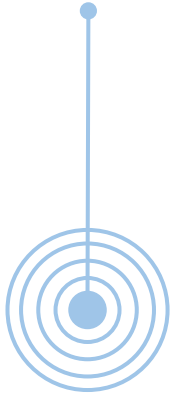





Roof
Second Floor
First Floor
Foundation
Superstructure
Brick - 95 %
Concrete - 98%

Recommendations

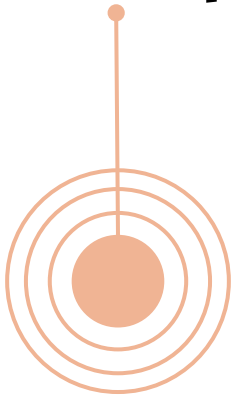
Low Cost



Inspect

Start Inspections at 25 Years Age

Medium Impact



Focus

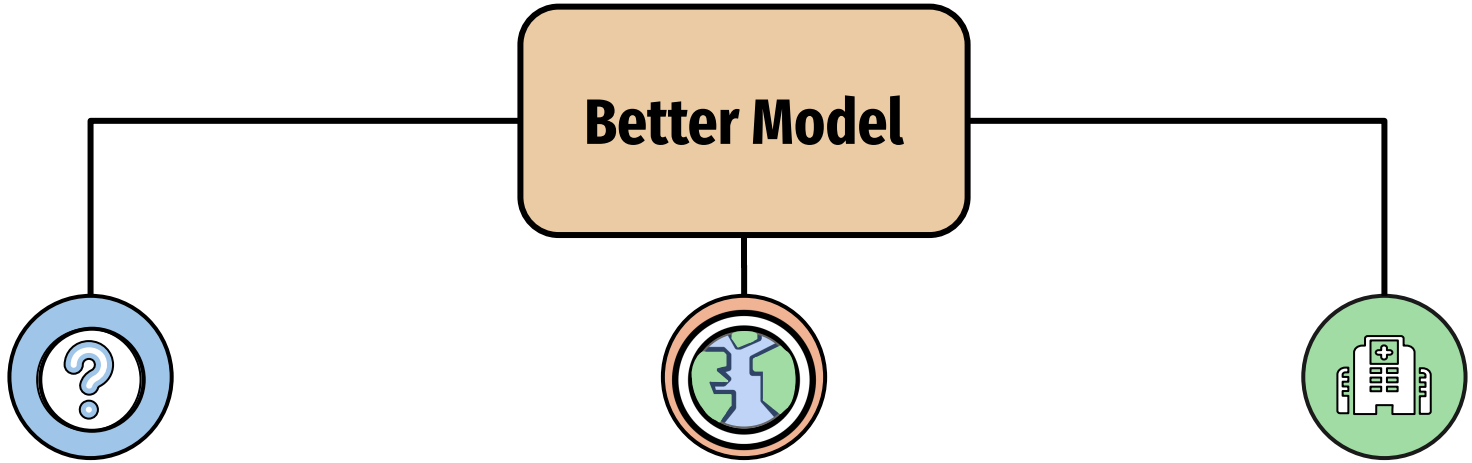
Focus Inspections on Tall Buildings with Small Base

Large Impact

Subsidize

Encourage Strong Superstructure

Future Research



Data

Non Damaged Buildings

Location

Deploy Worldwide

Time

Tandem with Ted's Time Series

Thank You!

Github:

Email:

LinkedIn:

Appendix

Earthquakes infographics

Richter earthquake magnitude scale