Roof Condition: Sometimes Beauty Goes Before Age

Helping insurers improve data-driven roof underwriting

November 2024

Industry Challenges

1 Wind & Hail losses made up 89% of all residential claims in 2023 with roofing line items included in 53% of all residential claims

2 Residential roof replacement versus repair in 2023 was much more common with inflation increasing cost of replacement **to $28K and repair to $10K, up +27% since 2020**

3 A home's roof is the most important major system of a house, but homeowners don't often know the history and facts about their roof

4 Jurisdictional requirements for roof replacement and risk mitigation are inconsistent and critical information is not widely captured

5 Home inspections are costly and not easily scalable and can provide inconsistent roof information from one inspector to the next

6 Inaccurate and missing ground-truth data has inhibited many insurers from adopting more sophisticated pricing, coverage, and risk management strategies

Existing Data & Analytics
Comparison of attributes/values

Multi-Source Roof Shape, Material, and Age
Due to a lack of widespread, ground-truth data, multiple sources of information are combined to provide a more accurate representation of a home's roof

Computer Vision Roof Condition Assessment
New techniques applied to a new source of information, aerial imagery, enable a clearer view of a roof's current and historical condition

Roof Replacement Cost Estimation
Timely material and labor rates along with deeper understanding of current construction standards help understand the cost to replace damaged roofs
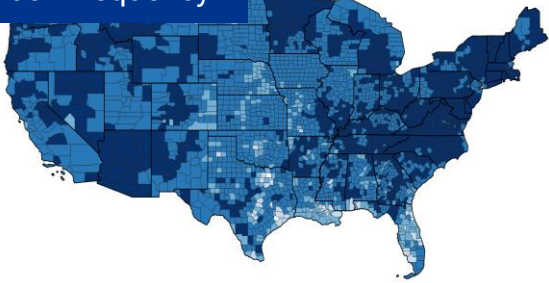
Geospatial Weather
Real-time and historical weather exposure provides greater context to the wear and tear of roofs and roofing materials
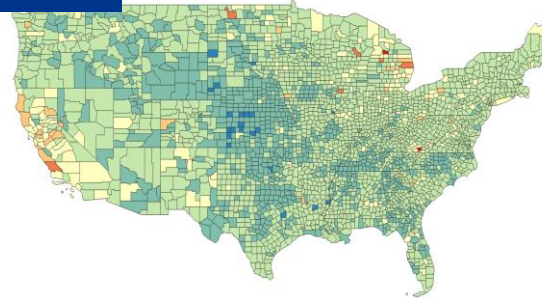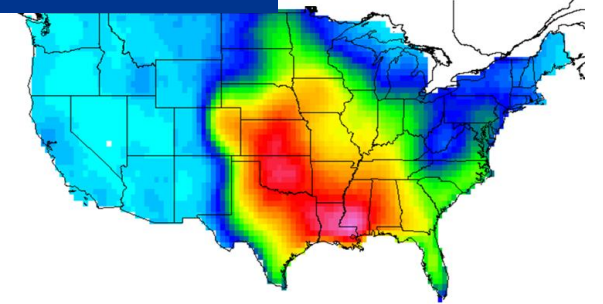
The Struggle with Disparate Roof Data
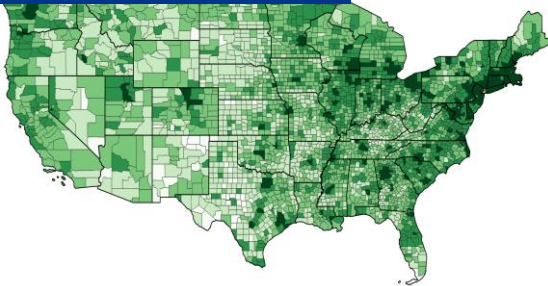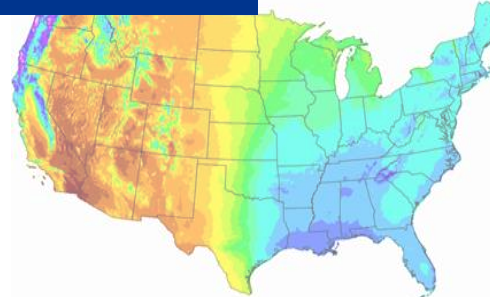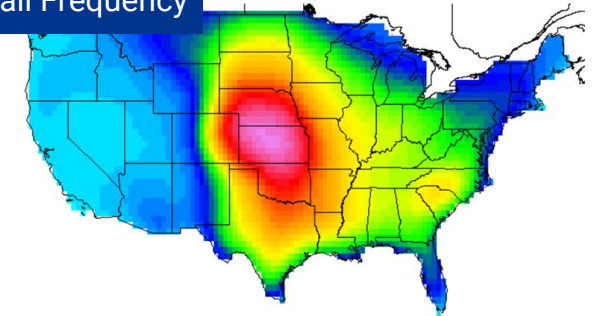

Gable Roof Frequency

Roof Age

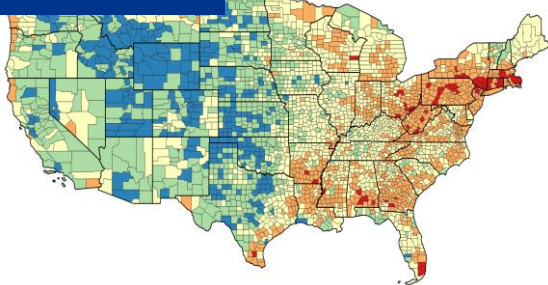Tornado Frequency

Asphalt Shingle Roof Frequency

Annual Precipitation
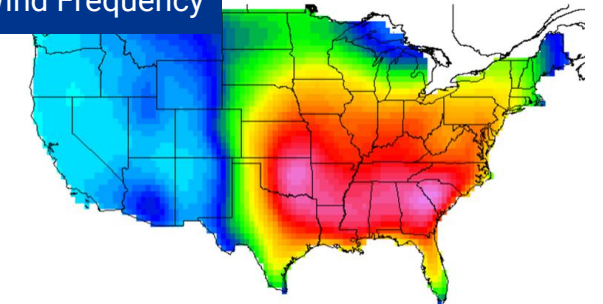
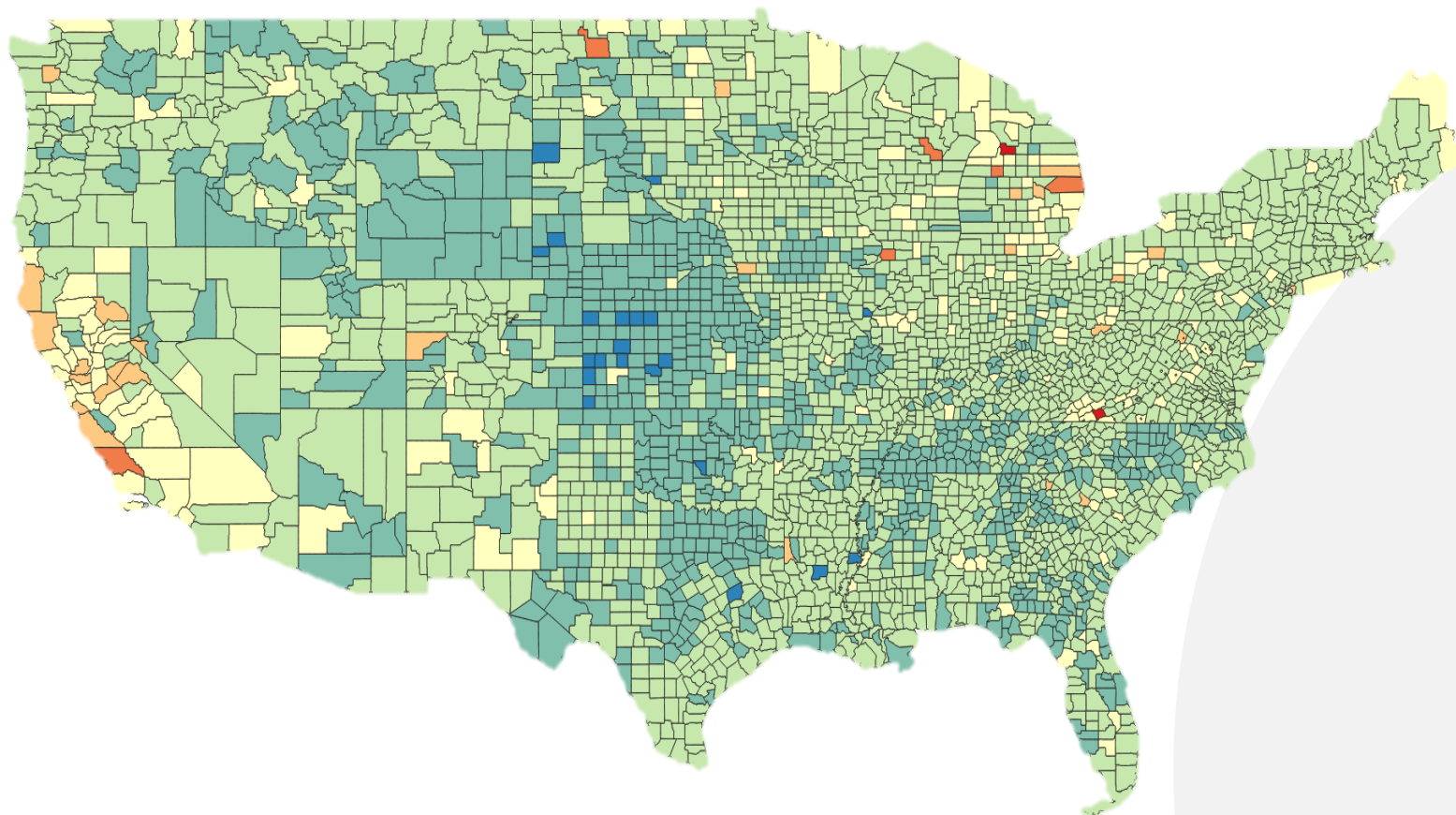Hail Frequency

Roof Condition Average

Climate Types

Wind Frequency

Roof Age

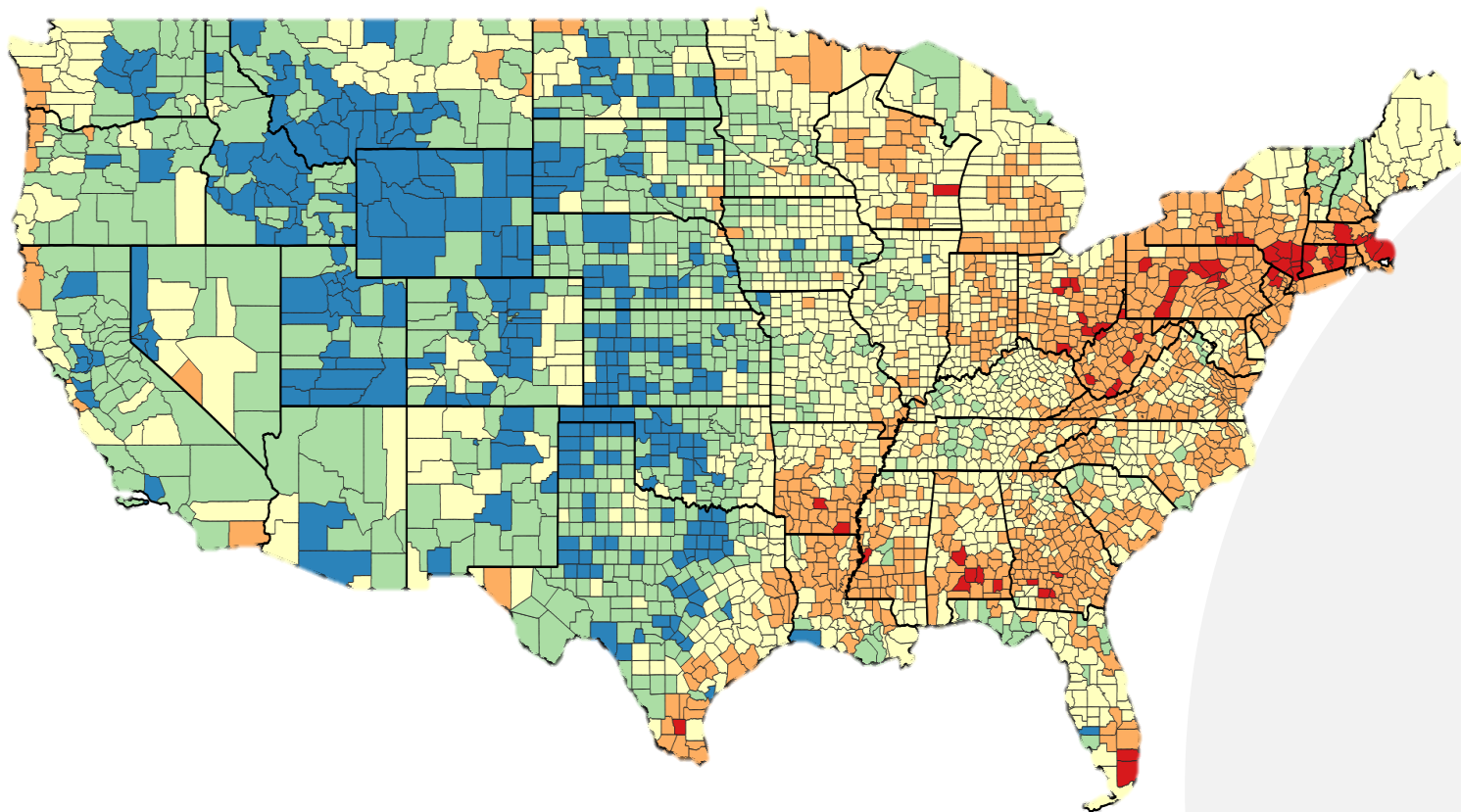Average age for asphalt shingle roofs

Multiple sources and unique methods are used to deliver the most accurate roof age data along with transparent confidence scores to help users:

- **Mitigate premium leakage**
- **Determine coverage**
- **Optimize workflow**

Roof Condition
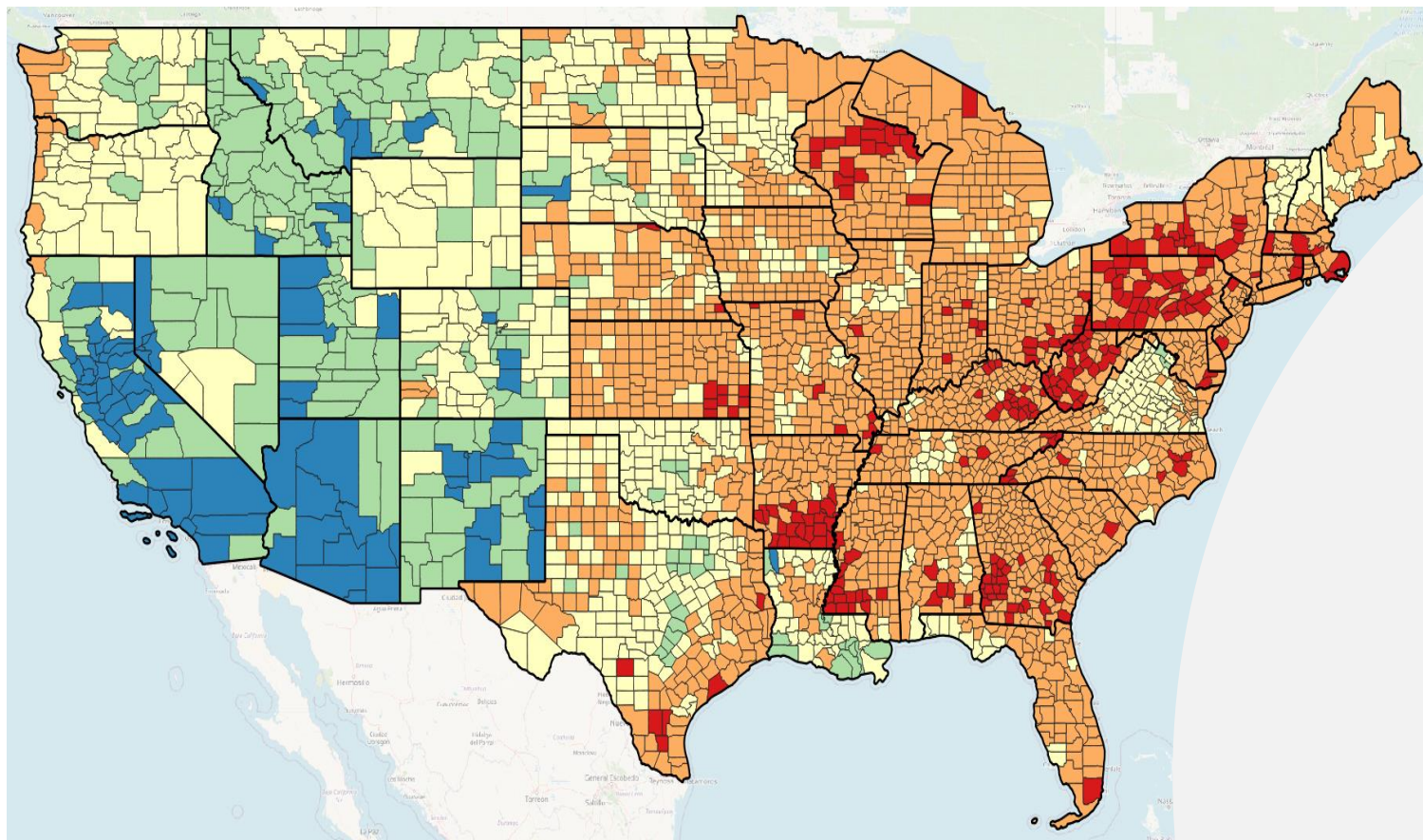## Average condition score for asphalt shingle roofs

Aerial imagery and computer vision provides a snapshot of a roof's condition at a point in time considering discoloration, water pooling, rust, defects, etc. to help users:

- **Optimize inspection**
- **Identify mitigation opportunities**
- **Bolster underwriting**

Verisk™

Harnessing Disparate Data to Unlock New Understanding in Roof Assessment
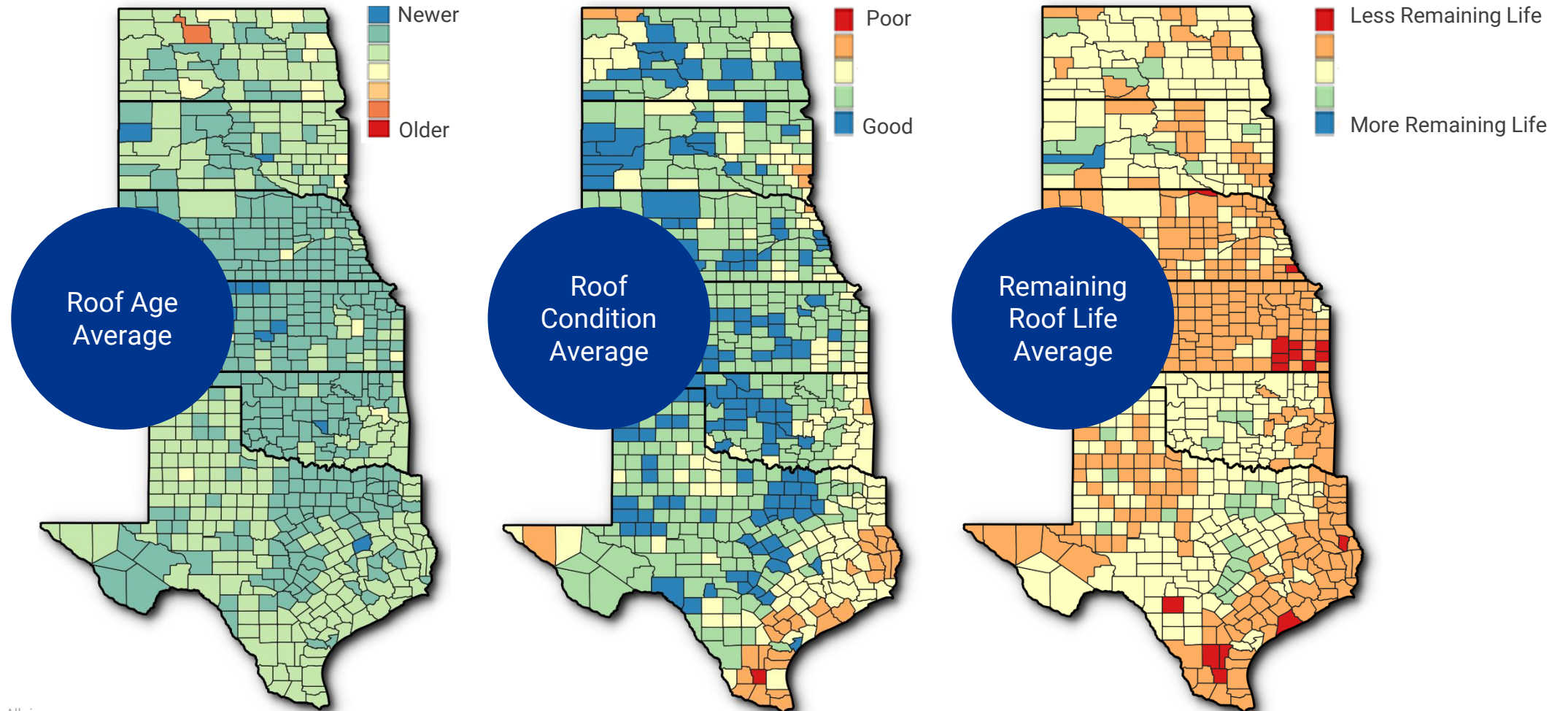## Remaining Roof Life – Asphalt Shingle Prototype

Combining age, condition, geometry, covering, and location is shedding light on the end of useful life to help improve risk assessment
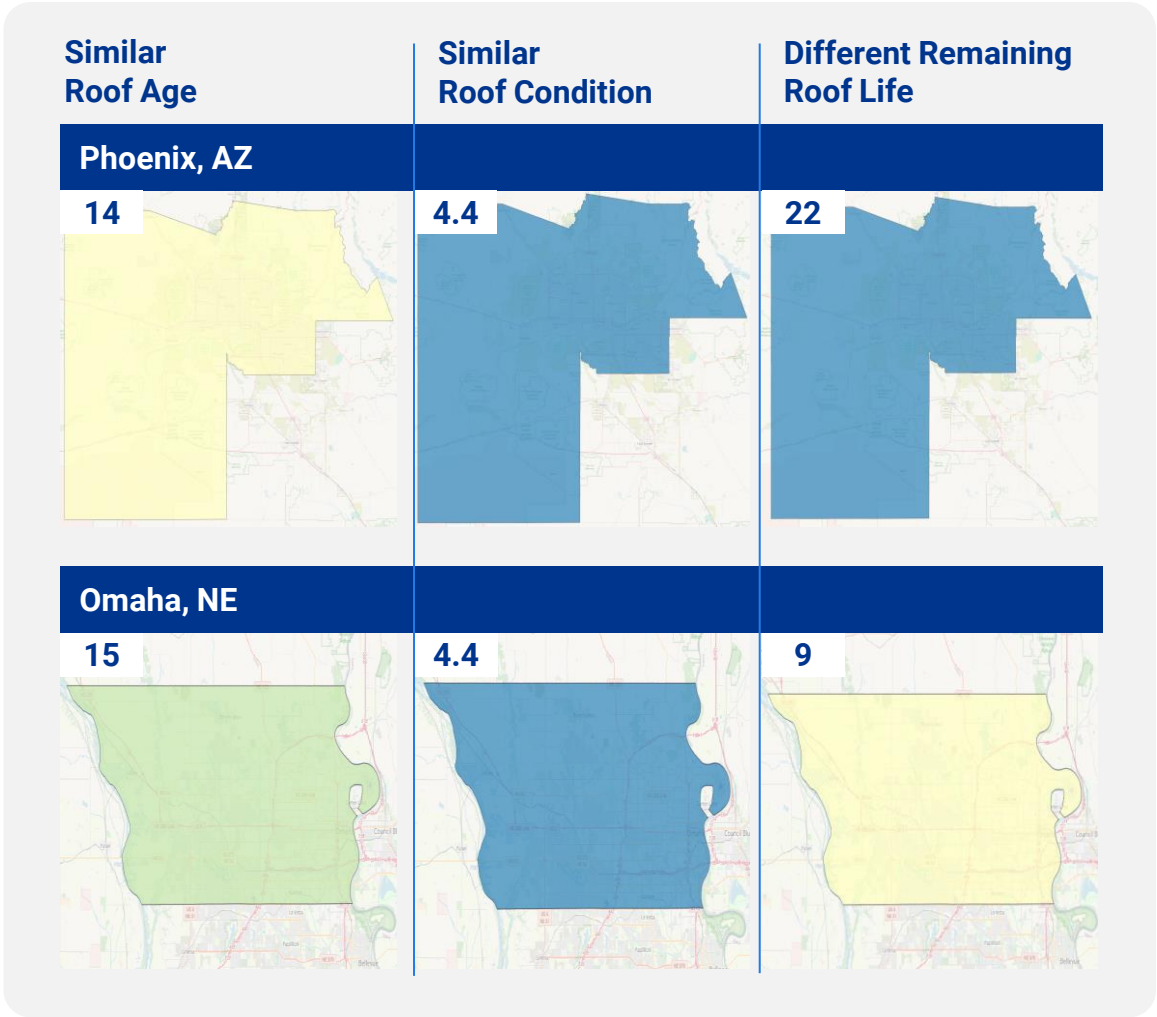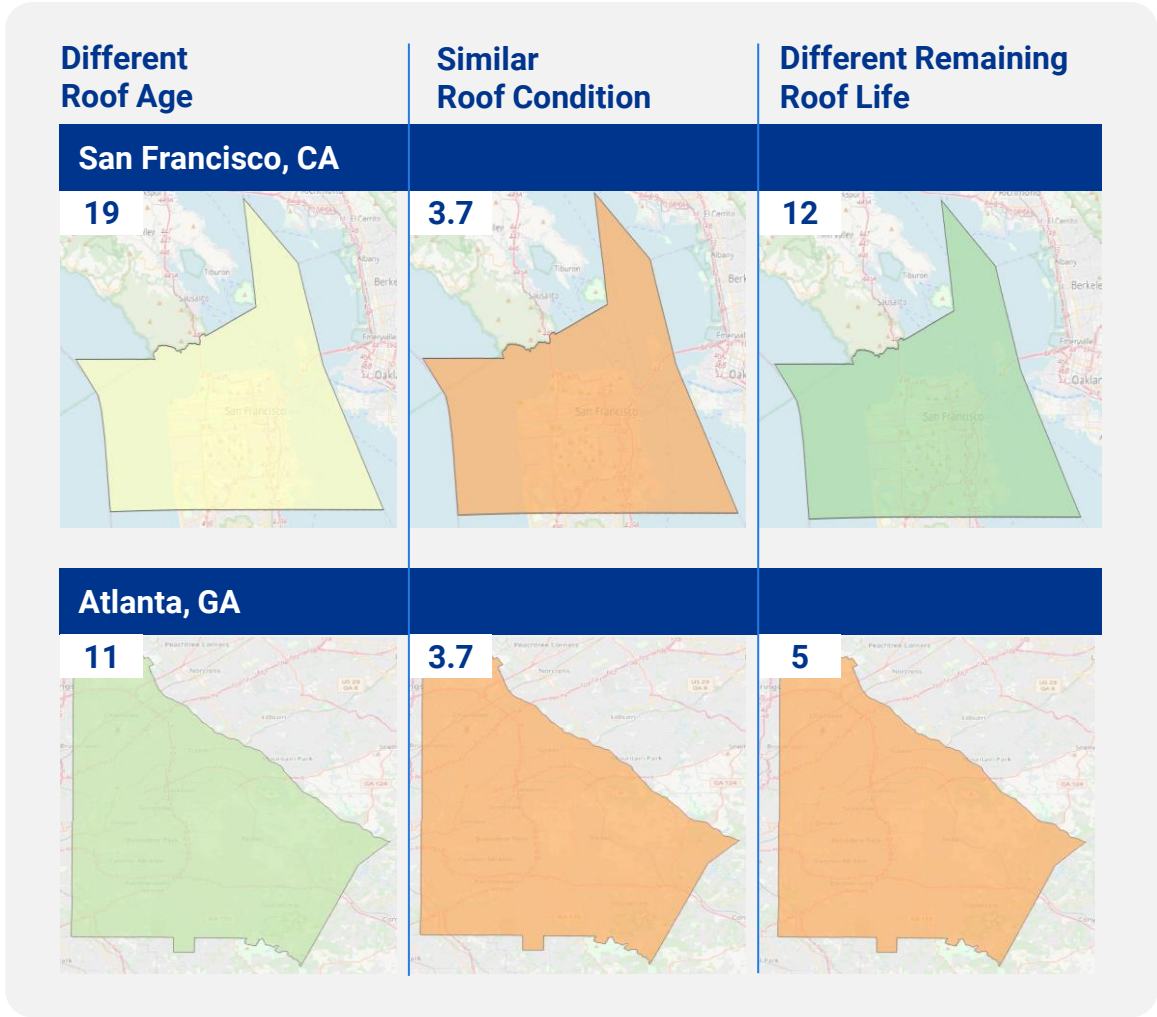
Harnessing Disparate Data to Unlock New Understanding in Roof Assessment
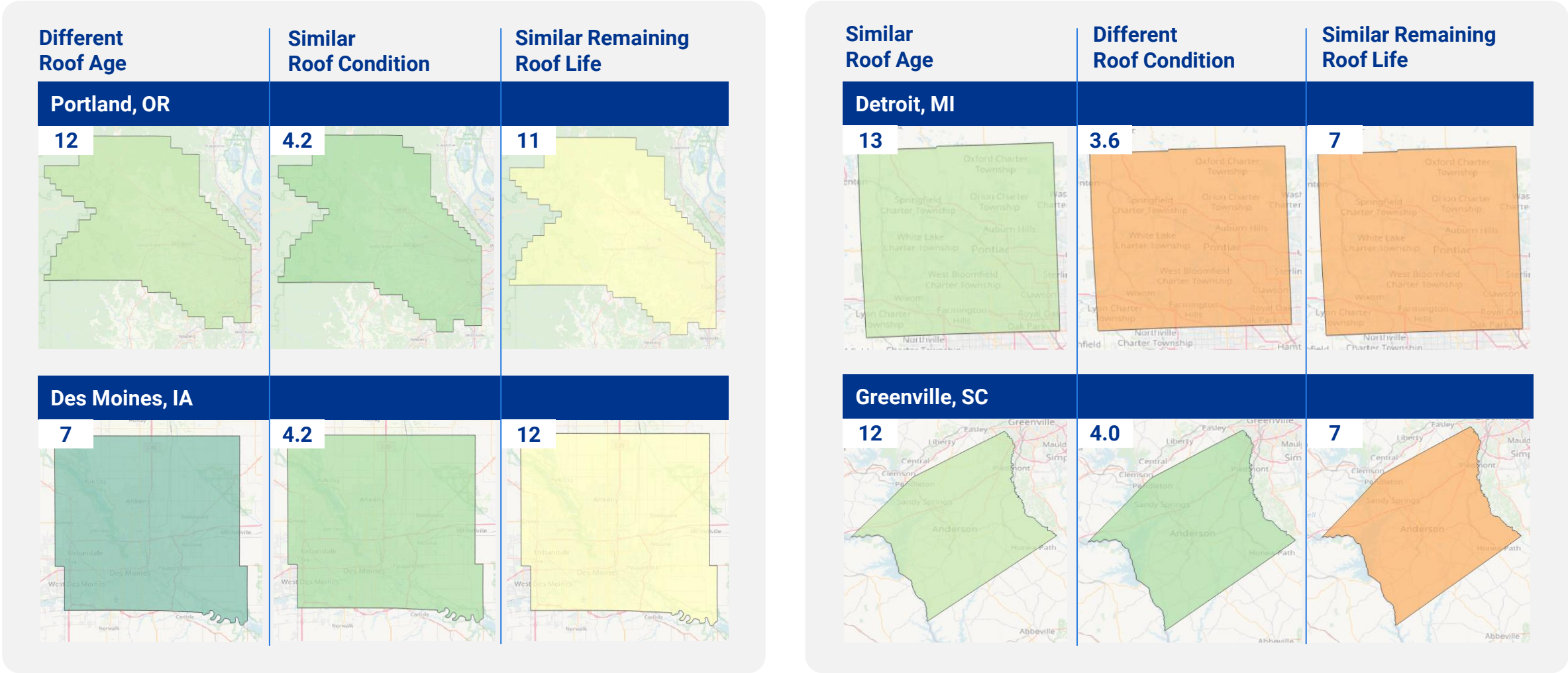
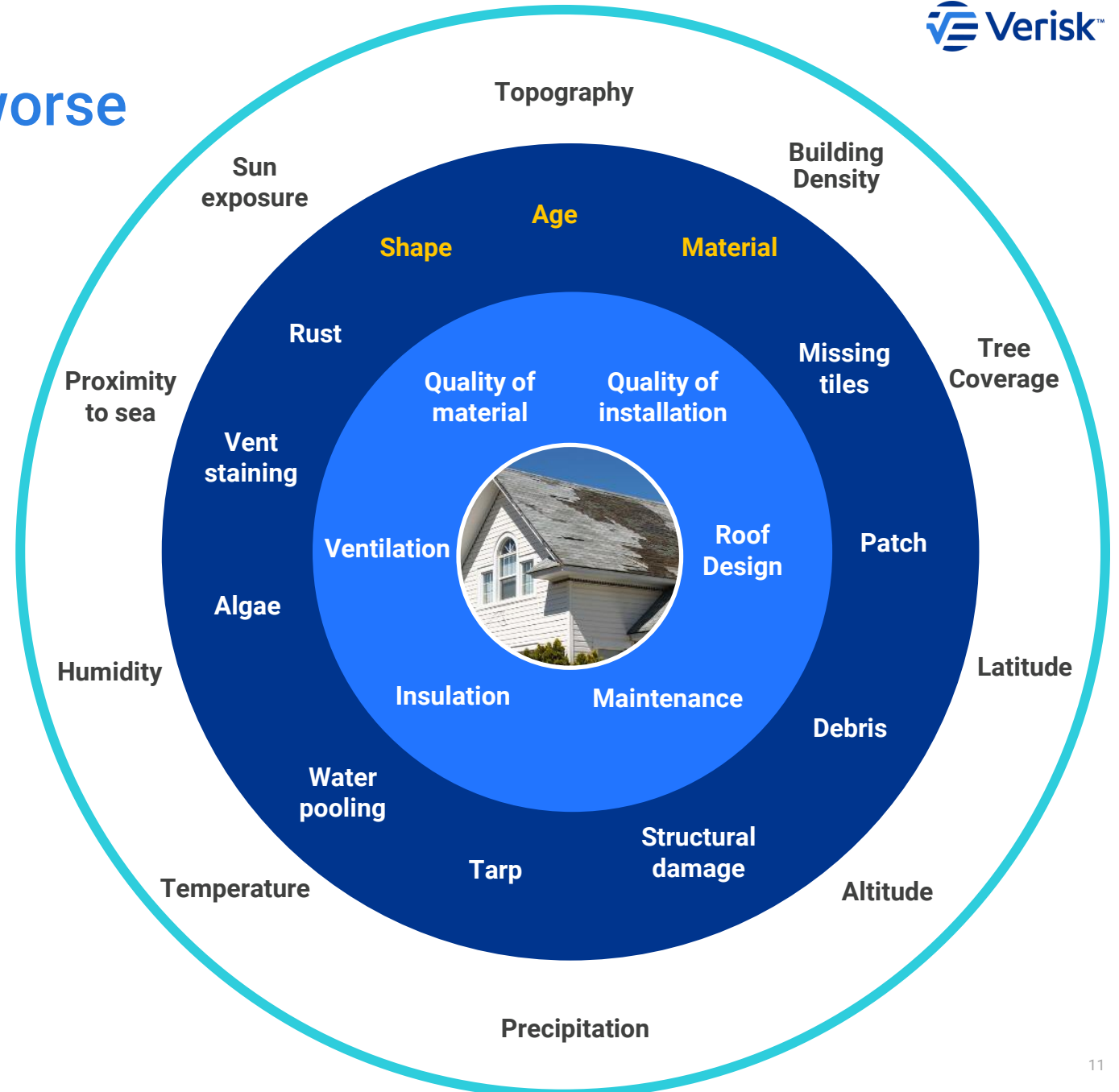## Remaining Roof Life – Asphalt Shingle Prototype

Roof Age Average — Newer / Older

Roof Condition Average — Poor / Good

Remaining Roof Life Average — Less Remaining Life / More Remaining Life

Comparison Against Existing, Disparate Data

Different Roof Age	Similar Roof Condition	Different Remaining Roof Life
San Francisco, CA		
19	3.7	12
Atlanta, GA		
11	3.7	5

Similar Roof Age	Similar Roof Condition	Different Remaining Roof Life
Phoenix, AZ		
14	4.4	22
Omaha, NE		
15	4.4	9

Comparison Against Existing, Disparate Data

Different Roof Age	Similar Roof Condition	Similar Remaining Roof Life
Portland, OR		
12	4.2	11
Des Moines, IA		
7	4.2	12

Similar Roof Age	Different Roof Condition	Similar Remaining Roof Life
Detroit, MI		
13	3.6	7
Greenville, SC		
12	4.0	7

What makes a roof better or worse

Roofs degrade differently due to a variety of factors, including materials, installation quality, environmental conditions, and maintenance practices
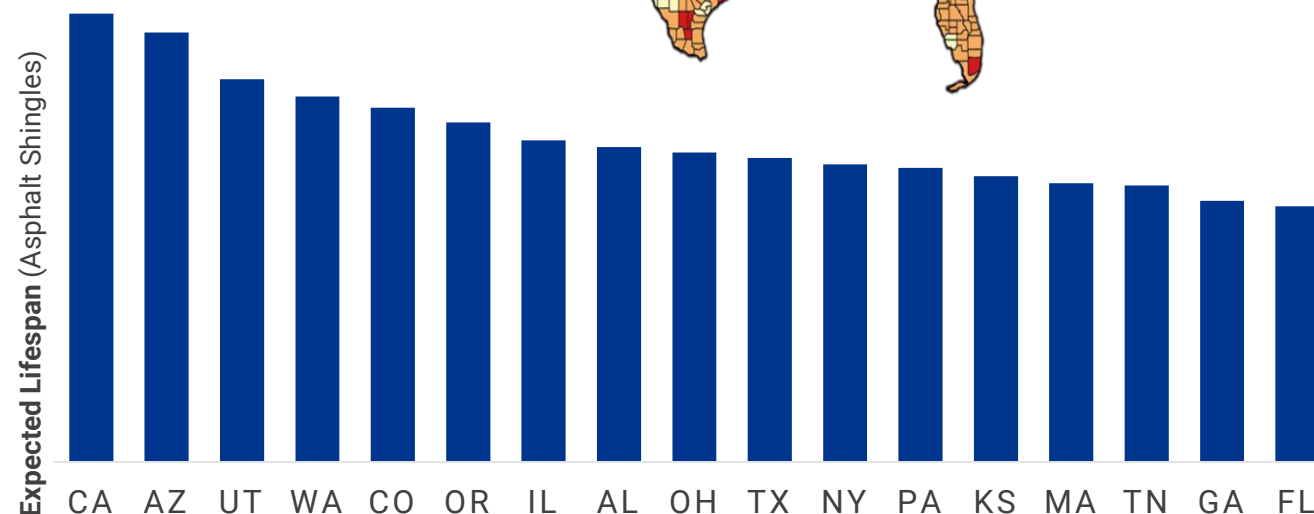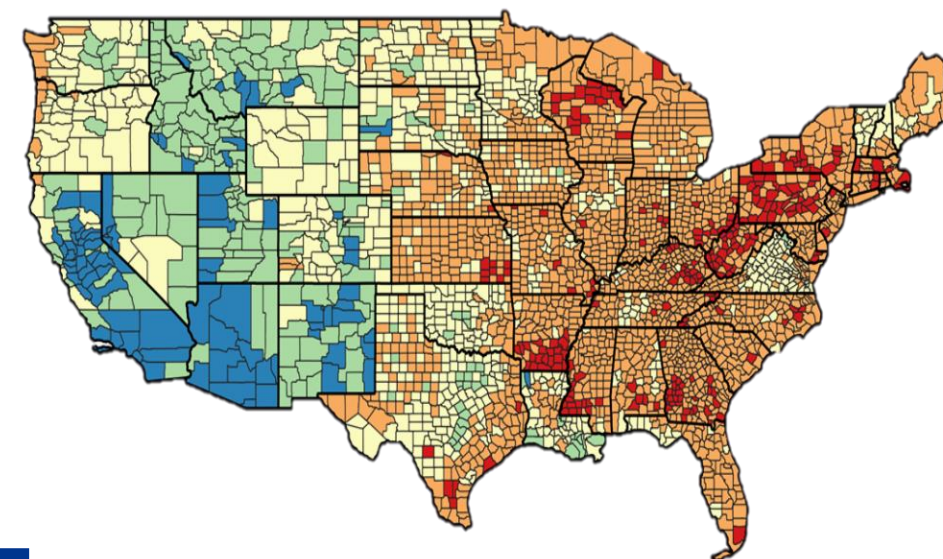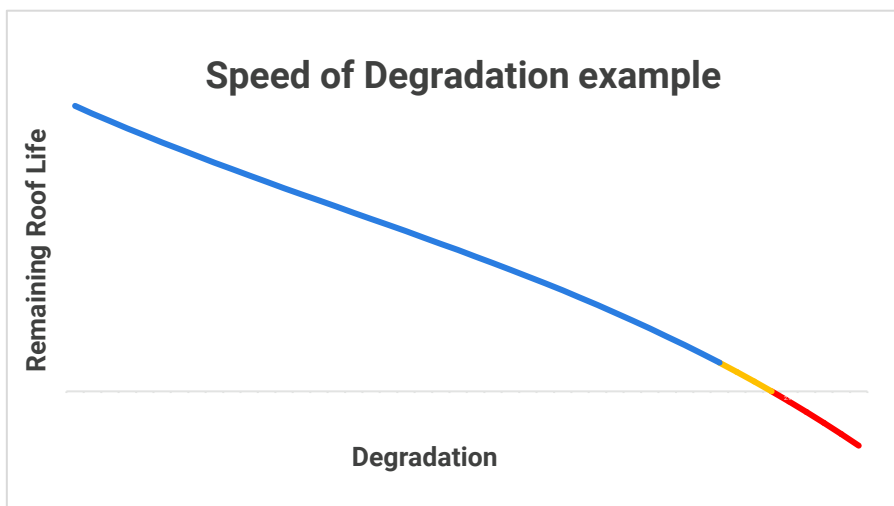
Those factor can lead to various signs of roof degradation, from minor discoloration to structural damages.
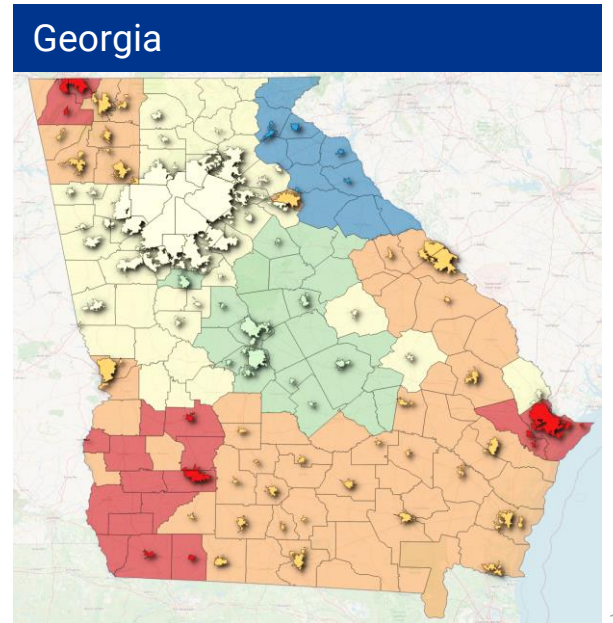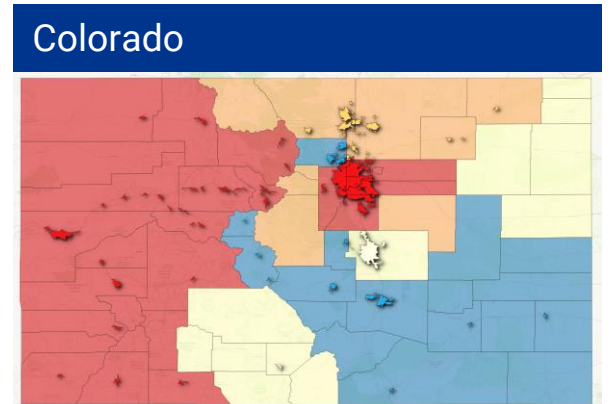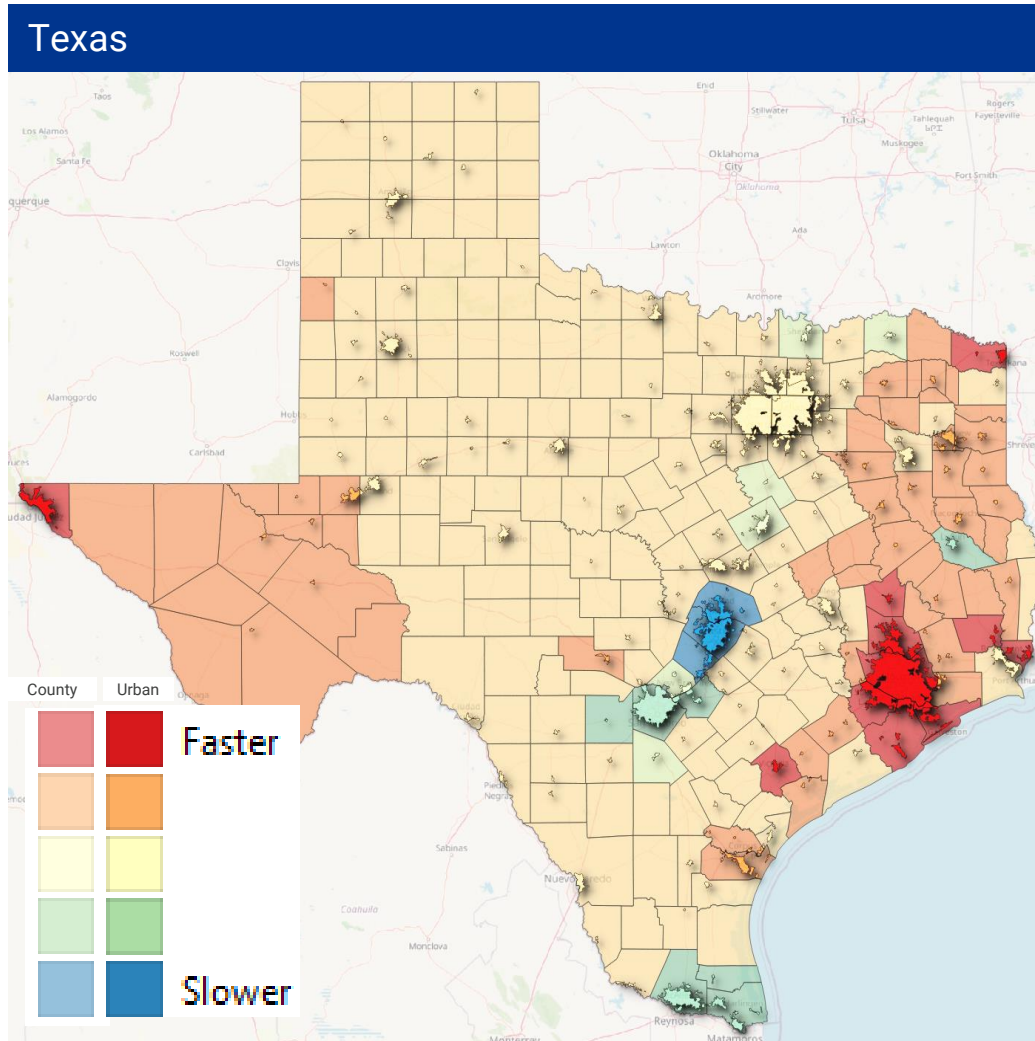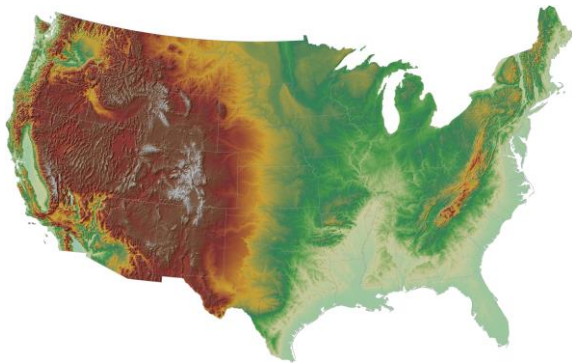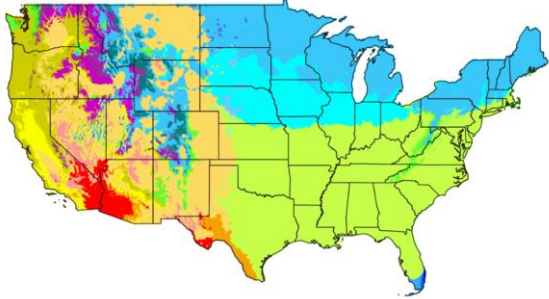
Speed of degradation – Expected lifespan

The speed of degradation in the eastern regions is likely driven by climate, which features humid subtropical and humid continental conditions with warm to hot summers, mild to cold winters, and high precipitation and humidity year-round.

Speed of Degradation example

Remaining Roof Life

Degradation

Expected Lifespan (Asphalt Shingles)

CA AZ UT WA CO OR IL AL OH TX NY PA KS MA TN GA FL

Speed of Asphalt Shingle Degradation
Climate conditions drive organic degradation differently within states
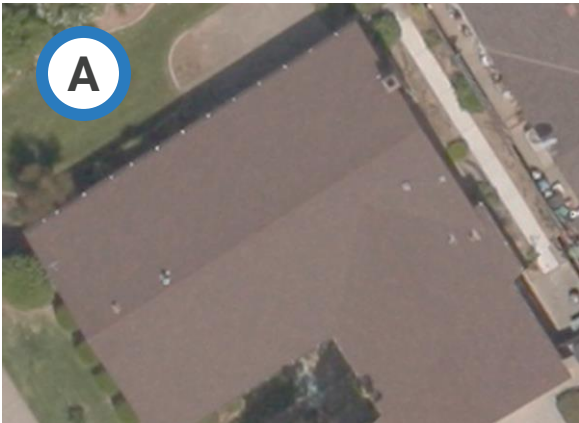

Köppen Climate Types of the United States

Texas

Colorado

Georgia

County | Urban

Faster

Slower

Speed of degradation in action
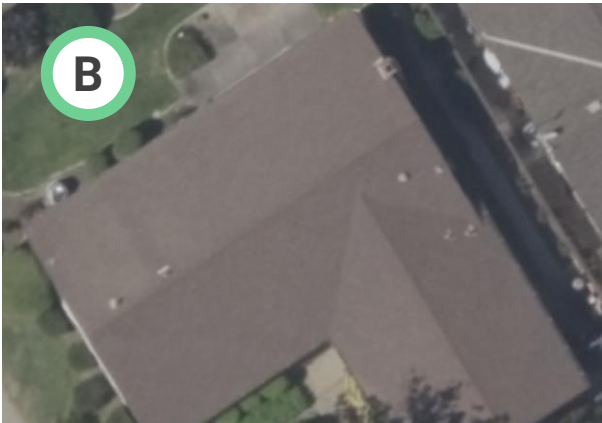
2013   **2024**
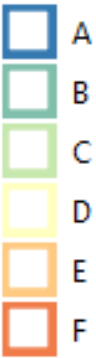

St. Petersburg, FL

Sacramento, CA

Remaining Roof Life class   **Remaining Roof Life interval**
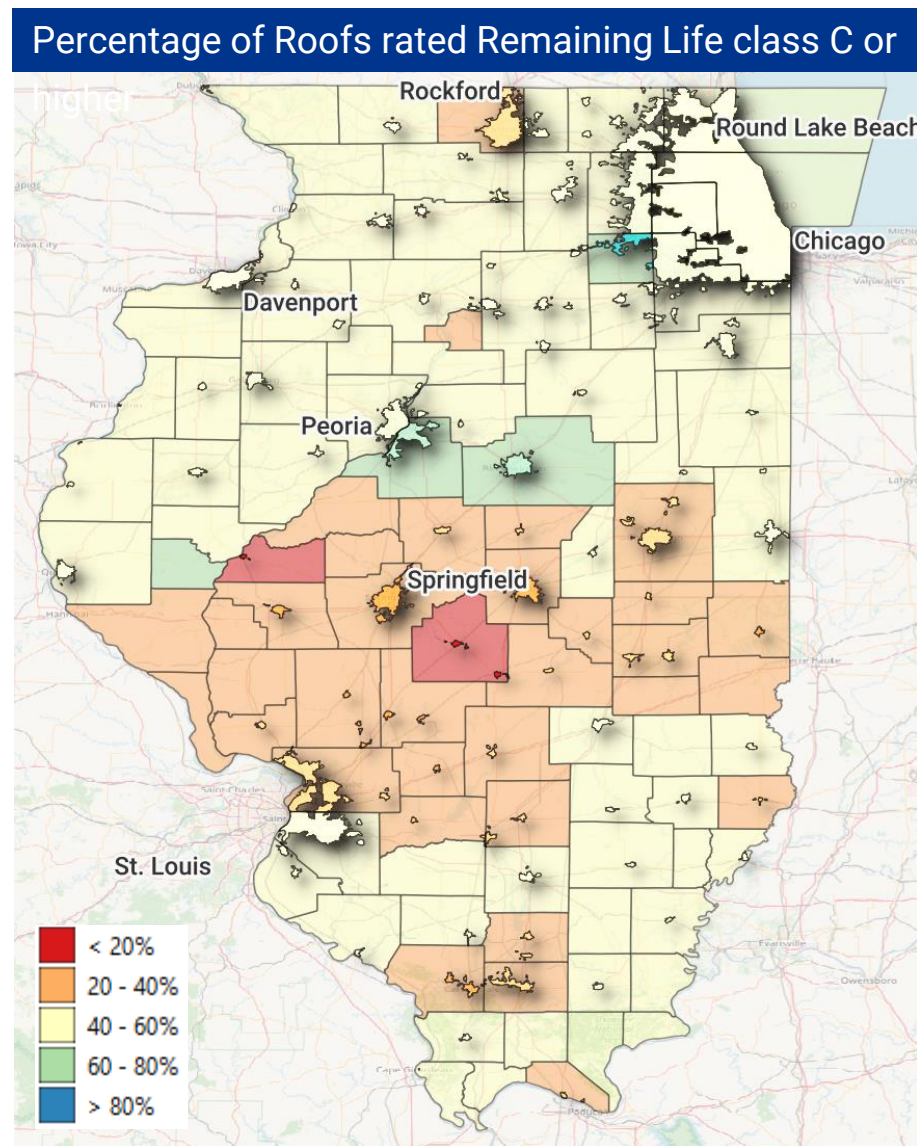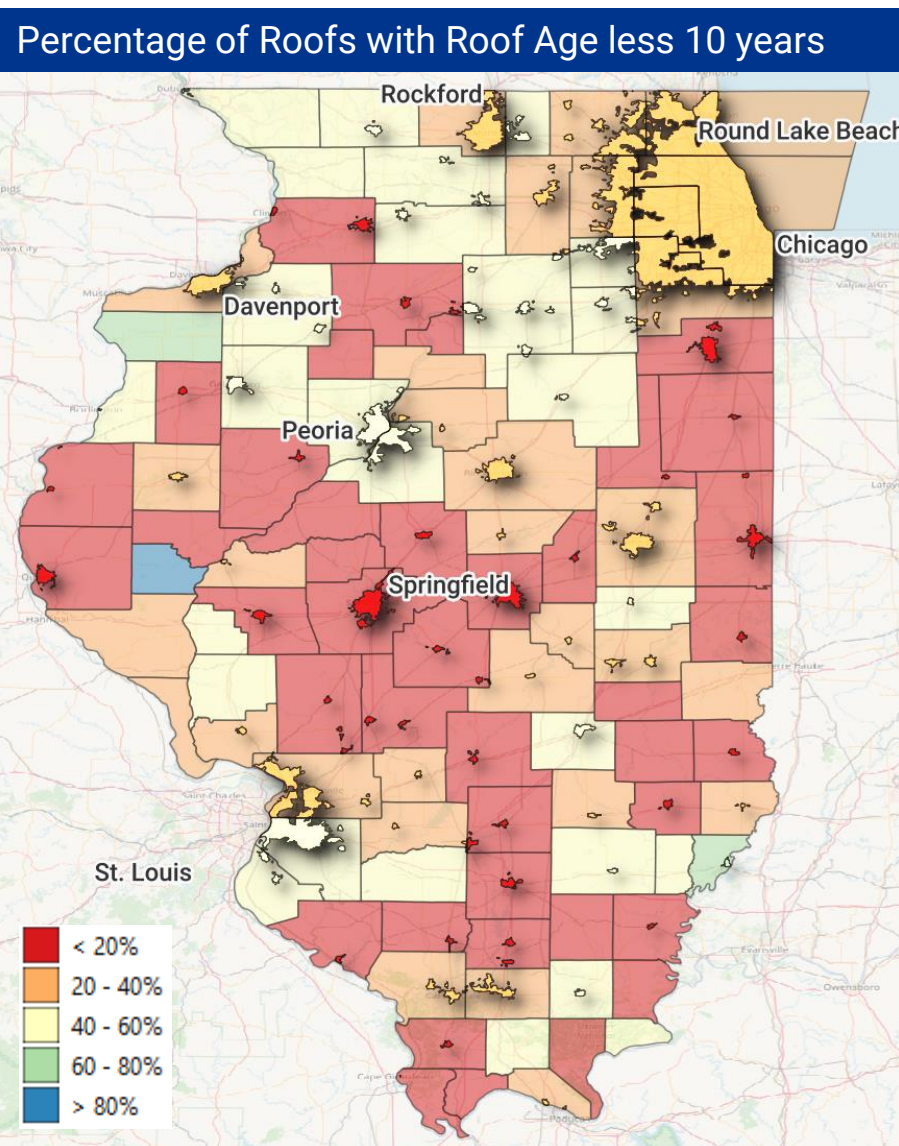
A   Newer

B

C

D

E

F   Overdue

Finding the yes

Understanding the geographical variation of degradation speed and **Remaining Roof Life** status **would help insurers profitably write more business**

Percentage of Roofs with Roof Age less 10 years

Legend:
- < 20%
- 20 - 40%
- 40 - 60%
- 60 - 80%
- > 80%

Percentage of Roofs rated Remaining Life class C or higher

Legend:
- < 20%
- 20 - 40%
- 40 - 60%
- 60 - 80%
- > 80%

Thank you