Chicago Build 2026 · Future of Midwest Track

The Future of Roofing Intelligence

How Aerial Thermography Is Transforming Building Asset Decision-Making



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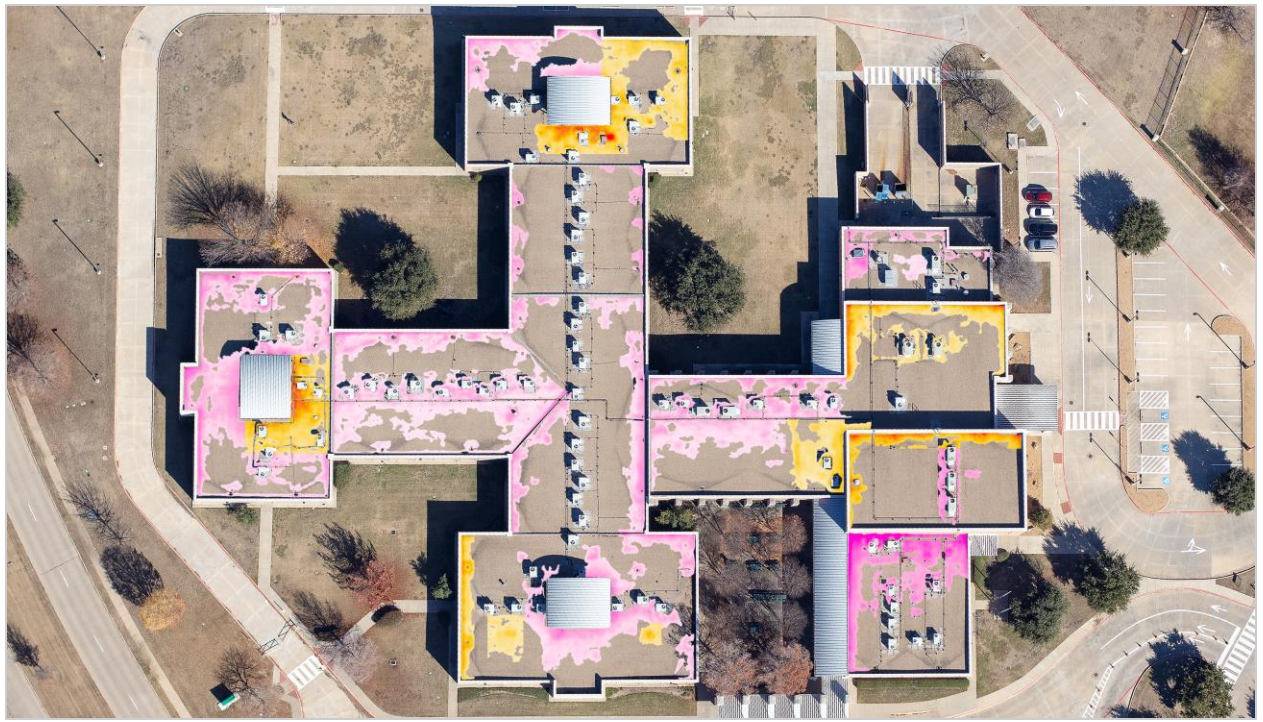
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From Observation to Decision-Ready Intelligence

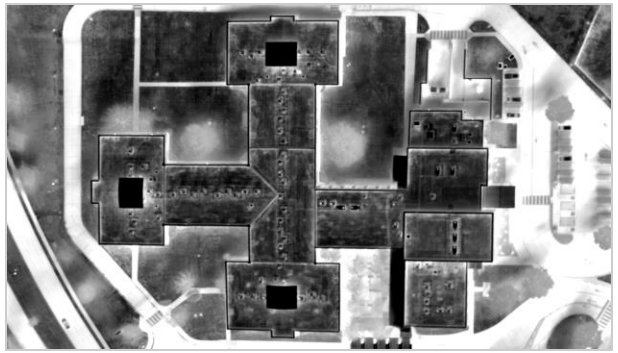
Roofing intelligence is organized, interpreted, and decision-ready information that improves how building assets are evaluated and prioritized.



Intelligence is not an image. It is organized, interpreted, and validated information.



BLENDED



INFRARED



VISUAL

2 · The Visibility Problem

What You Can See Is Not Always What You Need to Know

Some of the most consequential conditions affecting a commercial roof can remain invisible from the surface.

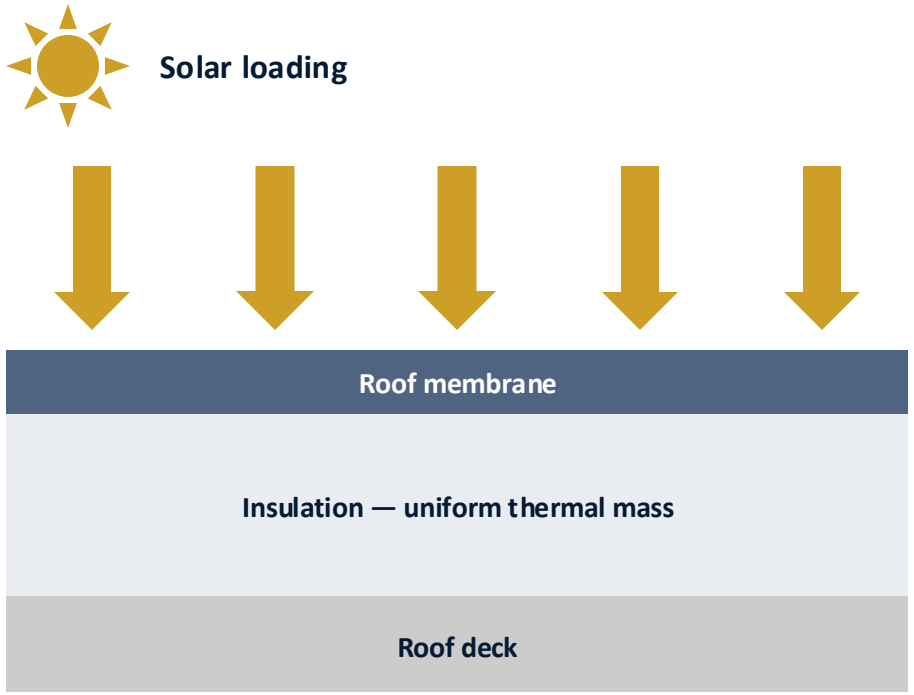
> *Surface appearance does not always reflect underlying condition.*

Conventional View

Thermal Overlay

Moisture Changes How a Roof Retains and Releases Heat

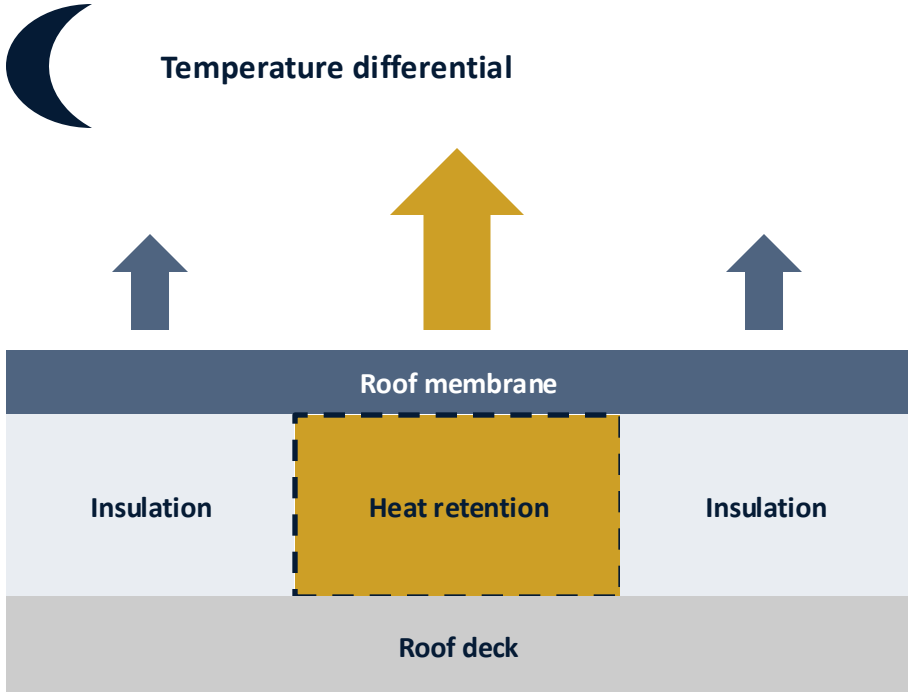
Daytime — Solar Loading Phase



Heat absorbed uniformly across the surface

Solar Loading | Thermal Mass

Evening — Thermal Release Phase



Wet insulation holds heat longer — the signal we detect

Heat Retention | Area Requiring Further Investigation

Collection timing, weather conditions, and roof assembly characteristics all influence thermal data quality.

Aerial Thermography Is a Complete Data Process

Credible results depend on controlled collection, consistent processing, experienced interpretation, and clear delivery.

1

Flight Planning

Environmental conditions, timing, and route design

2

Fixed-Wing Aerial Collection

Visual and thermal sensors, controlled altitude and speed

3

Image Processing

Georeferencing, mosaicking, and quality review

4

Analysis and Professional Validation

Anomaly identification, context, and expert review

5

Decision-Ready Delivery

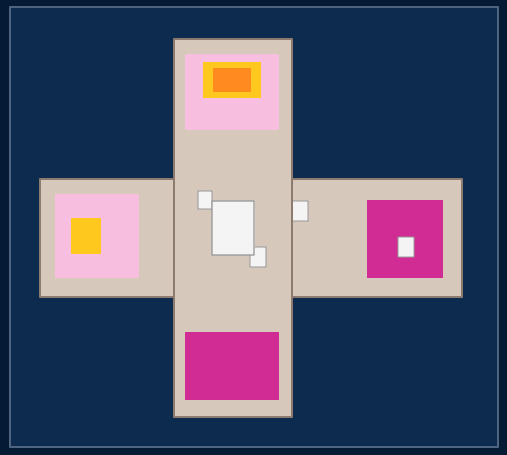
Organized findings, prioritized for action

From "What Is Happening on This Roof?" to "Where Is Risk Concentrated Across the Portfolio?"

Fixed-wing collection allows organizations to evaluate large roof areas using a more consistent collection method.

01

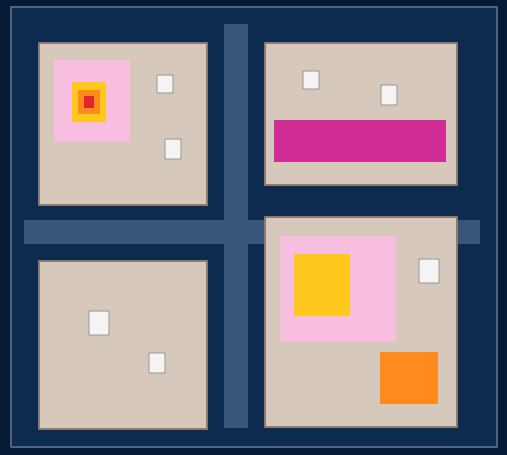
One Building



One roof, inspected in full detail

02

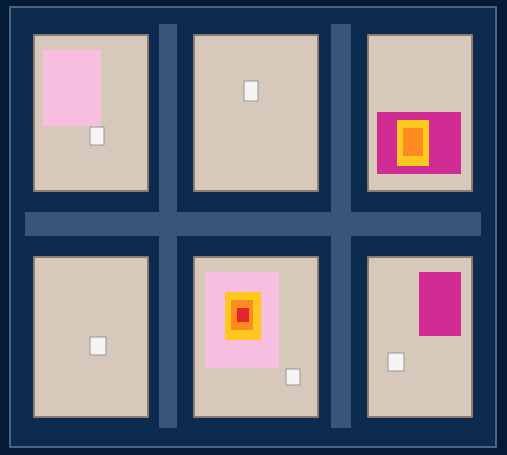
One Campus



Multiple buildings compared on one site

03

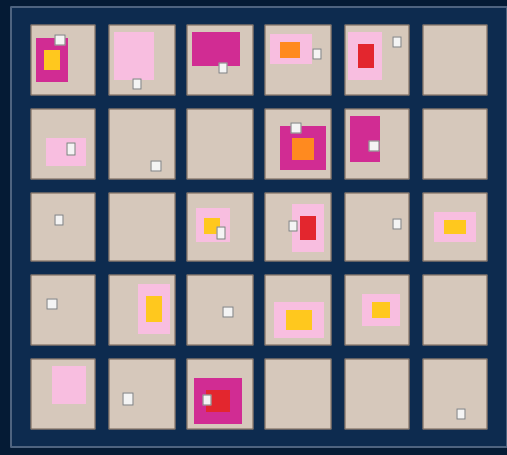
One Region



Many sites across a region, collected consistently

04

One Portfolio



Every property in one comparable view

Portfolio Destination

Moisture anomalies (low → high)

Thermal anomalies requiring review

Dry roof

Consistency of collection method supports consistency of comparison across properties.

Technology Identifies the Signal. Expertise Establishes the Meaning.

Human expertise governs the outcome

01

Thermal Signature

Aerial data captures temperature differentials

02

Analysis

Pattern identification across imagery

03

Context

Site, assembly, and environmental factors

04

Validation

Expert review and quality confirmation

05

Professional Judgment

Human expertise determines meaning

06

Recommended Next Step

Action tailored to conditions and priorities

Not every anomaly is the same. *Not every anomaly requires the same response.*

AI Accelerates the Work. Human Expertise Directs the Decision.

AI and automation accelerate the analytical workflow. Human expertise remains responsible for context, interpretation, and every decision.

AI and Automation Support

- Image organization and quality control
- Pattern recognition across large datasets
- Data processing and georeferencing
- Change detection between collection cycles
- Prioritization for human review

VS

Human Expertise Remains Responsible

- Context and site-specific knowledge
- Thermal anomaly interpretation
- Investigation strategy
- Professional validation
- Judgment and decision-making

Better Data Strengthens Professional Judgment

Aerial thermography does not replace architects, building engineers, consultants, or facility professionals. It gives them stronger information for asking better questions and evaluating alternatives.



01

Existing-Condition Assessment



02

Repair, Restoration, Recovery, and Replacement Evaluation



03

Capital Planning



04

Acquisition Due Diligence



05

Project Documentation



06

Portfolio Prioritization

The same organized information supports different decisions for different professionals.

Consistency Creates Portfolio Visibility

Standardized information helps organizations compare properties, identify priorities, defer unnecessary investment, and suppo rt more defensible capital decisions.



01

Condition

What is the current state of each roof?



02

Consequence

What is the impact if this roof fails or requires emergency action?



03

Timing

When does action become necessary?



04

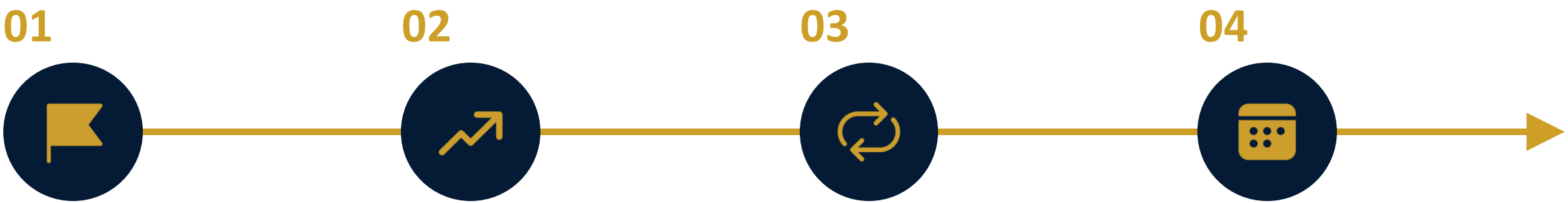
Capital Need

What investment is required, and when?

"When information is consistent and comparable, portfolio decisions become more defensible."

Repeat Collection Turns a Snapshot Into a Trend

Where a lone assessment falls short, repeated captures of the same portfolio reveal whether conditions are holding steady, shifting, or advancing.



Baseline

What is the documented condition of every roof today?

Progression

Have previously identified areas changed or grown?

Repeat Cycles

What emerges across cycles that one assessment cannot show?

Capital Plan

How should the findings shift timing and priorities?

“Repeat data turns a one-time assessment into a documented history.”

From One Leaking Building to the Whole Portfolio

Aerial thermography changes the investigation, the comparison, and the decision that follows.

01

One Building

Recurring leaks, unclear extent: where is the condition, and how far does it reach?

02

One Campus

Several aging roofs, limited budget: which roofs come first?

03

Standardization

One method, one time window, one dataset makes roofs comparable.

04

Cost of Inconsistency

Different people, times, and methods per property create blind spots.

“At portfolio scale, standardization matters as much as any single image.”

The Future Is Continuous, Comparable, and Decision-Ready

01

Repeat Aerial Collection

Consistent collection across cycles and seasons

02

Historical Comparison

Track change over time across the same properties

03

AI-Assisted Analysis

Accelerate review, surface patterns at scale

04

Portfolio Visibility

Every roof, comparable and prioritized

05

Capital Planning Confidence

Defensible investment decisions, portfolio-wide

What decisions become possible when every roof is visible?

Three Questions to Ask Before Your Next Major Roof Decision

1. What roof conditions are currently invisible to us?
2. Are we collecting consistent information across the portfolio?
3. Can we clearly defend our next capital decision?

Audience Q&A

Your questions welcome

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The Standard for Roof Data at Scale

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