



# New Insights for Property Insurance

*The Power of Deep Learning Applied to Aerial Imagery*



*"The property insurance segment is a highly competitive space, and insurers are looking for insights that can give them an edge. Industry leaders are discovering that sophisticated deep learning applied to aerial imagery can provide differentiating insights and risk scores in support of a variety of use cases."*

Mark Breeding, SMA Partner

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*This Use Case Study is based on SMA's ongoing research on aerial imagery, AI/deep learning, and the property insurance market. Cape Analytics has purchased distribution rights.*



## About This Research Report

*This use case paper is based on SMA's experience, research, and insights.*

*Cape Analytics has purchased the distribution rights to this research and use case paper. This is not paid-for research.*

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# Property Insurance: Challenges and Opportunities



## Property Insurance in Transition

Property insurance has been a challenging and competitive segment of the industry for many years, especially the homeowners line. After a rough spell, the industry experienced a few good years of sub-100 combined ratios, but then 2017 and 2018 had underwriting losses with poor combined ratios. While much of the focus and the blame is often attributed to big catastrophes, the reality is that insurers too often operate at the razor's edge, making it all too easy to tip into an unprofitable year. Many insurers recognize that there is too much dependence on having low CAT seasons, something that they have limited control over (other than restructuring their book and pulling out of key markets). Leading insurers are shifting the focus to improving underwriting effectiveness and expenses on the normal business flow so that CATs are not the main factor. If this is done properly, this positions them to write a profitable book even in a high CAT year. A major challenge for property insurers is to find new ways to gather more accurate information for quotes, gather and develop property intelligence to accurately assess property value and exposures, manage expenses through streamlined processes, and optimize inspections. Converting these challenges into opportunities relies in large part on information, especially information from new, more accurate, and more current sources.

***Understanding the exterior characteristics of the property and the surrounding hazards has always been a challenge, but geospatial imagery coupled with advanced deep learning and insurance expertise provides new insights. Geospatial information is available in many forms. But it is the deep learning that provides the level of accuracy, scale, and currency that make it possible to derive new insights.***

## Information and Insights Insurers Are Seeking

There are three categories of information and insights that insurers seek for property risk assessment:

- ✔ **Roof characteristics.** The dimensions and materials of the roof directly relate to potential risk and are important factors in determining replacement costs. Many specific measurements and characteristics are vital, such as the condition, style (hipped, gabled, flat, arched), geometry (pitch, area), and material (asphalt shingle, slate, tile, metal).
- ✔ **Other structures on the property.** The existence of decks, pools, trampolines, outbuildings, fences, and other permanent or temporary structures on the property present a variety of risks for the homeowner. These are not only at risk of damage via various perils, but they also create liability if someone is injured.
- ✔ **Related perils.** Other potential perils may surround the property, such as trees, streams, lakes, or other natural land formations that might contribute to damage to the property. The topography and elevation of the structures also factor into risk assessments. Even adjacent properties (vacant lots, industrial buildings, retail locations) introduce potential risk factors.

One of the most important developments underway in gathering information related to these areas is the shift from indirect sources of information (such as roof age) to direct sources (such as roof condition). Actual, current data (instead of proxies) will be more accurate and reflect the risk more appropriately.



## Powerful Use Cases Driven by New Geospatial Insights

There is high potential for insurance in using new data, insights, and scores from aerial imagery analysis for a wide variety of use cases. The examples in Figure 1 show potential for both top-line and bottom-line improvement in key business areas. Faster/more accurate quoting drives new business; real-time accessibility of data reduces underwriting expense and loss adjustment expense; new, accurate data ensures proper coverage. Ultimately, insurers will be able to write more profitable business.

Figure 1. Insurance Use Cases for Aerial Imagery and Machine Learning



As is evident from Figure 1, data related to properties fuels key use cases across the entire value chain. What is important about these use cases is that they all have great potential to move the needle – and result in measurable improvements to key insurance metrics.





## Opportunities in Homeowner Quoting

Many insurers recognize that improving the quoting process is essential to customer acquisition. Whether it is an agent entering information on behalf of a customer or the homeowner entering their own information via direct, digital means, the time involved and the ease of the process is vital. SMA recently assessed the homeowners quoting process for 20 prominent insurers and MGAs. One of the conclusions of the assessment was that, in most cases, there are still many data fields to fill out and limited pre-fill taking place. Even when the user interface is modern, the homeowner or agent may not know the details of some of their property characteristics such as the square footage of the roof or the roof style. This area offers ample opportunity for insurers to differentiate from the competition by increasing data pre-fill and providing new insights to produce more accurate quotes.

### Use Case: Rate Capture at Time of Quote

Security First Insurance is an innovative, Florida-based homeowners insurance company. The company has been taking a customer-centric approach to their business, offering advanced mobile and digital means of interactions with agents and policyholders. Security First Insurance recognized that they could improve the customer experience during the quote process by providing real-time, accurate information about roof characteristics. At the same time, they were able to address an important issue – the misclassification of roof shape (whether intentional or not) that generated premium rates that did not reflect the actual risk.



#### Security First Insurance™

*"Cape Analytics' solution provides us with instant access to validated property features at the time of quote. Their data and technology have been extremely valuable to our business and improving customer experience."*

Werner Kruck, COO  
Security First Insurance

#### Description

*Security First Insurance leverages roof shape (hip vs. gable) and Roof Condition Rating to capture the appropriate rate at the time of quote. With these new insights, Security First Insurance was able to reduce premium leakage due to the erroneous extension of wind mitigation credits for roof shape, where the roof was reported as a hip construction but was, in fact, a gable construction and therefore more susceptible to wind damage.*

#### Impact

*By integrating Cape Analytics data in their online Quick Quote application, Security First Insurance was able to increase the accuracy of online quotes, reduce reliance on agent/applicant supplied information, and offer a better agent/insured experience – all while reducing premium leakage across their book.*



## Opportunities in New Business Inspections



Customer acquisition costs in insurance are high when all of the related expenses are considered. But any insurer seeking to grow their top line must focus on bringing in new business. The homeowners line is unlike personal auto – the assessment of risks and pricing are both more complicated. In auto, there are well-defined models and features which make it easier to calculate replacement costs in the event of an accident. For homeowners, there are unlimited combinations of property characteristics, even when looking at the roof alone. In many cases, an inspection of the property will be required before the insurer can make an accurate assessment. Determining when inspections are needed and how to obtain property-characteristics-data through other sources presents an important opportunity for insurers to reduce acquisition costs.

### Use Case: New Business Inspection Optimization



**"The actual improvement we've experienced by using Cape Analytics goes beyond the inspection cost. Consider that we only had "eyes" on about 40% of the actual new business policies we wrote. With the introduction of Cape into our process, we now have roof information and imagery for over 85% of the policies we write, resulting in much better outcomes for lower total cost."**

A homeowners insurance-focused carrier

#### Description

**This carrier integrated Cape Analytics across 100% of their book of business. Prior to Cape, this carrier had relied on a property-based algorithm to determine if an inspection was required on all new business. As a result, this carrier was inspecting approximately 40% of its new policies with action rates that were under 20% on those properties they did inspect. This was very costly and overall ineffective. By updating their new business workflow to automatically triage properties based on Cape roof geometry and roof condition rating, this carrier was able to understand which properties were most likely to result in an actionable inspection discovery and focus their inspection program on those homes. In addition, the process helped identify properties the carrier chose not to accept outright based on roof condition alone.**

#### Impact

**This carrier was able to reduce inspection spending by over 50% while improving underwriting quality.**



## Opportunities in Underwriting Automation

A major focus for P&C insurers has been to increase automation of the underwriting process. Insurers have been working on increasing the percentage of business that is subject to straight through processing (STP) for many years, but the homeowners line tends to have a very low percentage of STP due to its complexity and need for significant data. Since the property characteristics make up an important portion of the data required to assess risk and determine replacement costs, any solution that provides data for pre-fill and enables automated decisioning can contribute to increased STP rates.

### Use Case: Straight-Through Underwriting Automation

Columbus, Ohio-based State Auto Insurance is a super-regional carrier that is a leader in innovative thinking, as evidenced by their InsurTech investment fund and the partnerships/investments they have made in InsurTech startups. The company has been growing their homeowners line through new business selection and focused pricing. They have sought out technology solutions to improve automation to simplify the quoting and policy issuance process for agents.



**"Our partnership with Cape Analytics has helped us gain confidence in our fully automated underwriting process by providing us new insights into the homes we're insuring. As a result, independent agents are able to spend more time offering the advice and counsel that makes them so valuable."**

Mike LaRocco, President & CEO  
State Auto

#### Description

**State Auto is using Cape Analytics' property attributes to auto-select those risks shown to provide the most profit potential. State Auto has found Cape Analytics to be an integral part of their carrier strategy of moving toward greater digitization and straight through processing.**

#### Impact

**The integration of Cape data into the underwriting workflow allows State Auto to make better risk decisions faster, reducing future losses while continuing to improve State Auto's customer experience. By using Cape early in the property vetting process, State Auto is able to streamline and automate underwriting.**



## Opportunities in Renewal Inspections



Insurers have always been looking for more efficient approaches to renewals because saving expenses there improves profitability. When a property needs to be inspected for renewal purposes, it adds cost. The challenge is determining when an inspection needs to be ordered and when accurate and current information can be obtained by other less expensive means.

### **Use Case: Renewal Inspection Optimization**

California-based CSAA, founded in 1900, offers personal lines insurance in 23 states and the District of Columbia through partnerships with affiliate AAA clubs. The insurer serves more than 17 million members across the country. CSAA has been on the innovation path for a number of years, first modernizing their core technology foundation, then partnering with InsurTech startups and innovators in other industries such as Uber and Lyft. CSAA has been a leader in exploring new coverages and services for its members. One of the important areas they wanted to tackle was the renewal process.



**Insurance** | CSAA Insurance Group

**“Insurance companies use roof age as a proxy for roof quality, but all insurers are challenged when it comes to roof information. You could have a five-year-old roof that is in terrible condition or a fifteen-year-old roof that is in amazing condition. Cape Analytics equips us with more insights and a numeric score that we can use to effectively evaluate roof quality.”**

Patrick Knutson  
Property Product Manager  
CSAA Insurance Group

### **Description**

**CSAA is leveraging Cape Analytics’ Roof Condition Rating to optimize its renewal inspection program, directing inspectors toward homes with bad roof condition while avoiding unnecessary inspections of homes with good roof condition.**

### **Impact**

**By using Cape data within the renewal workflow, CSAA achieved greater efficiency of inspection spending by reducing inspections of high-quality roofs, providing more accurate pricing at renewal, and mitigating future losses by helping members proactively repair damaged roofs.**



## SMA Summary



There is a great deal of discussion about the potential of AI and deep learning in insurance, with many trying to determine where the highest value will be realized. It is clear from the use cases discussed in this paper that high value is already being demonstrated in the property insurance space. New data sources – in this case, aerial imagery from satellites, fixed-wing aircrafts, and drones – are being used to create new insights that insurers are using for competitive differentiation. However, it is also very clear that the value delivered is not just about the data, the analytics tools, or the insurance expertise, but ultimately the unique combination of all three of these elements. The industry is still in the early stages of discovering the possibilities for leveraging these types of solutions for property insurance across the value chain.

Insurers looking for enhanced capabilities for property insurance should consider four major factors when evaluating new technology solutions. Providers should have these capabilities:

- ✔ **Broad coverage:** It is paramount that the solution provider has the aerial imagery data and analysis for the properties across the geographic areas where the insurer writes. Whether it is a single state, a regional area, or the entire country, it is important to have the information not only for the properties for existing policyholders but also for any that may become prospects.
- ✔ **Scale:** The solution provider needs the information on the properties required by the insurer at the point when it is needed, which, in the case of a quote, is immediate. This means that pre-processing is required, not just imagery from drones-as-a-service or pay-as-you-fly providers. Pre-processing, in combination with on-demand capabilities, is the optimum choice.
- ✔ **Insurance expertise:** Purpose-built solutions by suppliers with a deep understanding of insurance and the specific uses of the data offer the best options for partnership.
- ✔ **Real-time data delivery:** Some use cases require that the property information is available within seconds or milliseconds. This means that the data must be available in the cloud and accessible on-demand via APIs to service individual transactions.

Cape Analytics provides these capabilities and has built a platform supporting many use cases. The company has a strong senior management team, has gained momentum with insurers, and should be on the short list for any company seeking innovative new property insurance solutions.

***“Cape Analytics is a great example of an InsurTech startup that has demonstrated value for insurers across a variety of use cases. Their broad coverage and data science/ deep learning expertise have enabled them to provide insights that fuel innovation and optimization for insurers.”***

Deb Smallwood, Founder  
Strategy Meets Action



## About Cape Analytics

Cape Analytics applies machine learning and computer vision to geospatial imagery in order to provide instant property intelligence for 90 million residential and commercial buildings across the United States. It is the only solution available that offers accurate and comprehensive property intelligence at time of quote, with the speed and breadth necessary to fundamentally improve underwriting and inspection processes, and the objectivity needed to power new rating variables and pricing models. This includes a targeted selection of rigorously developed property attributes and loss-predictive signals such as Roof Condition Rating. Today, the company's solutions are primarily used within the carrier underwriting, quoting, rating, and post-event workflows. These innovations are possible due to Cape Analytics' global team of computer vision and data science PhDs, paired with insurance and risk analysis experts. Cape Analytics is backed by leading venture firms and innovative insurers, having raised \$31M to date.

For more information on Cape Analytics, visit [www.capeanalytics.com](http://www.capeanalytics.com).



## About Strategy Meets Action

At Strategy Meets Action, our clients advance their strategic initiatives and accelerate their transformational journeys by leveraging our forward-thinking insights, deep vendor knowledge, and vast industry expertise.

Strategy Meets Action is an advisory firm that works exclusively with insurers and vendors in the P&C market, offering advisory retainers and project-based consulting services.

Click here for [www.strategymeetsaction.com](http://www.strategymeetsaction.com).

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