Inventing Smart Property Inspections with AI and Drones
Background: Severe Weather Is More Frequent & Causes More Losses

September 2017, Hurricane Irma
Total Losses: $50 Billion\(^1\)

April 2016, Hailstorm, San Antonio, TX
Total Losses: $1.4 Billion\(^2\)

$306.2 Billion\(^1\)
2017, US

The cumulative cost of the 16 separate billion-dollar weather events in the U.S. in 2017 was $306.2 billion, breaking the previous cost record of $214.8 billion (2005).

Data Source:
1. Office for Coastal Management
2. Claims Journal
Target Problem: Current Property Inspection Workflow

**Claims Inspection**
To see if storm damage is present and to determine if it will warrant an indemnity payment

- Climb ladder, walk on roof, chalk roof, visually find damages
- Organize and assemble images manually to generate image report
- Draw roof diagram and write the estimate report manually

**Underwriting Inspection**
To identify “hazards”, or conditions which increase the risk of a loss

- Climb ladder or use camera pole to capture roof imageries
- Manually organize images and generate image report
- No damage assessment
Pain Points: Costly, Inefficient, Inconsistent, Low Quality Imageries

Claims Inspection
Human subjectivity and error creates inconsistent findings, high risk of accidents when adjusters access the roof

<table>
<thead>
<tr>
<th>Claims Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Cost</td>
</tr>
<tr>
<td>Low Efficiency</td>
</tr>
<tr>
<td>Long Cycle Times</td>
</tr>
<tr>
<td>Inconsistent Results</td>
</tr>
</tbody>
</table>

Underwriting Inspection
Lack of complete assessment of risk that are present due to not accessing the roof

<table>
<thead>
<tr>
<th>Underwriting Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less Roof Imageries</td>
</tr>
<tr>
<td>Poor Image Angles</td>
</tr>
<tr>
<td>Incomplete Coverage</td>
</tr>
<tr>
<td>Inconsistent Report</td>
</tr>
</tbody>
</table>
# Addressable Market Size

## Residential and Commercial Property Insurance

<table>
<thead>
<tr>
<th>Property Type</th>
<th>Industry</th>
<th>Total # Properties</th>
<th>Volume</th>
<th>Inspection/Unit</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>Underwriting</td>
<td>90 Million</td>
<td>45 Million&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td>$30</td>
<td>$1.35 Billion</td>
</tr>
<tr>
<td></td>
<td>Claims (Hail/Wind)</td>
<td>2.25 Million</td>
<td>2.25 Million</td>
<td>$800</td>
<td>$1.8 Billion</td>
</tr>
<tr>
<td>Commercial</td>
<td>Underwriting</td>
<td>5.6 Million&lt;sup&gt;3&lt;/sup&gt;</td>
<td>2 Million</td>
<td>$200</td>
<td>$0.4 Billion</td>
</tr>
<tr>
<td></td>
<td>Claims (Hail/Wind)</td>
<td>0.15 Million</td>
<td>0.15 Million</td>
<td>$2,600</td>
<td>$0.4 Billion</td>
</tr>
</tbody>
</table>

## Appraisal and Mortgage

<table>
<thead>
<tr>
<th>House Type</th>
<th>Total # Transactions</th>
<th>Inspection/Unit</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Home</td>
<td>5.34 Million&lt;sup&gt;4&lt;/sup&gt;</td>
<td>$550</td>
<td>$2.9 Billion</td>
</tr>
<tr>
<td>New Construction</td>
<td>0.67 Million&lt;sup&gt;4&lt;/sup&gt;</td>
<td>$550</td>
<td>$0.4 Billion</td>
</tr>
</tbody>
</table>

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Our Solution: AutoFly Drone + AI + Unbeatable Pricing Model

### 1. Autonomous Drone Flight
- Minimal requirement for pilot's skillset
- Standardize image acquisition
- Make drone operation as easy as possible
- Significantly increase inspection efficiency

**Replace Ladder & Enable Any Pilot**

### 2. Artificial Intelligence
- Consistent damage assessment
- Automated report generation process
- No chalk inspection needed
- Dramatically reduce roof climbing

**Absorb Adjuster’s Experience**

### 3. Unbeatable Pricing Model
- Dramatically reduce carrier’s cost
- Easier to penetrate the market
- No one is able to offer our price, not even close
- Remove biggest barrier to adopt drones

**Remove Entry Barrier**

### Pricing Model
- **Drone App**: Free
- **Premium Damage Assessment**: $40
- **Underwriting (including Pilot)**: $25~$75
# Our Solution: Benefits

<table>
<thead>
<tr>
<th>Category</th>
<th>Others</th>
<th>Bees360</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claims Inspection Efficiency</td>
<td>2~4 inspections/day, including report</td>
<td>8-12 inspections/day, including report</td>
</tr>
<tr>
<td>Claims Turnaround Time</td>
<td>7 days</td>
<td>On-site ~ 24 hours</td>
</tr>
<tr>
<td>Claims Processing Cost</td>
<td>$600~$1200/claim</td>
<td>Less than $100</td>
</tr>
<tr>
<td>Result Consistency</td>
<td>No consistency</td>
<td>Consistency guaranteed</td>
</tr>
<tr>
<td>Underwriting Inspection Quality</td>
<td>Limited imagery information</td>
<td>More complete imagery information</td>
</tr>
<tr>
<td>Underwriting Drone Inspection</td>
<td>$150~$400/inspection</td>
<td>$25~$75/inspection</td>
</tr>
</tbody>
</table>
Uniqueness: Most Accurate Damage Assessment AI in the US

Bees360: Automated Damage Detection AI (85%+ Accuracy)

- 10ft x10ft test square
- Close-up image projection on rooftop
- Detection results
- Cropped detailed damages

Others: Poor Quality (<30% Accuracy)
Uniqueness: Unbeatable Pricing Model

Bees360:
$25~$75/underwriting inspection, including pilot fee

Other competitors:
$150~$400/underwriting inspection, including pilot fee

Client Comment:
“We all want to use drones for underwriting, but only Bees360’s price is close to our current pricing model. They are our only choice. On top of that, their technology is the best we have ever seen.”

- Bill Crawford, CEO of Associated Services Inspections
Marketing Strategy

Three Success Factors for To B Technology:

• Significantly increase efficiency
• Significantly lower cost
• Significantly improve customer experience
Business Model

**Software**
- AI-powered damage assessment
- Property measurements
- Intelligent drone flight
- Elevation inspection app

**Hardware**
- Drone leasing program
- Drone & accessory online sale
- Drone swap/replacement
- “Worry-free” drone care

**Services**
- Bees360 drone pilot network
- Onboard training
- Drone maintenance
- FAA Part 107 exam prep

**Applications**
- Dr.360 drone pilot network
- Onboard training
- Drone maintenance
- FAA Part 107 exam prep
Current Operation: Cover 36 States, Nationwide Pilot Coverage

- States (in green): 36
- Top Three States: TX, OK, FL
- # total jobs: ~24,000
- # images: ~3,000,000
- # registered pilots: ~600
- Pilot coverage: Nationwide
Thank you!
• **H.R. 4753 (Crenshaw R-TX) - Drone Origin Security Enhancement Act**
  - To prohibit the Secretary of Homeland Security from operating or procuring foreign-made unmanned aircraft systems, and for other purposes
  - Passed Homeland Security Committee with bipartisan support (10/23)
  - If approved, the bill would block the Department of Homeland Security from purchasing or operating unmanned aircraft from China’s DJI Technologies

• **S. 2502 (Scott R-FL) - American Security Drone Act of 2019**
  - A bill to ban the Federal procurement of certain drones and other unmanned aircraft systems, and for other purposes
  - Introduced

• **H.R. 2500 (Smith D- WA) - National Defense Authorization Act for Fiscal Year**
  - Passed House
• Lawsuit filed on behalf of “visual journalists” in U.S. District Court to challenge Government Code 423
  • The plaintiffs’ pending lawsuit challenges aspects of Government Code 423
  • The plaintiffs are challenging the application of “capture” as it pertains to Government Code 423
    • Currently, it is unlawful to conduct surveillance with an unmanned aircraft
    • However, “surveillance” is not defined
    • “Unmanned aircraft” also is not defined
Objective of the Working Group:
• To review existing laws affecting the safe operation of unmanned aircraft
• Recommend proposed legislation or proposed changes that support the safe operations of unmanned aircraft.

Items discussed:
• National Airspace Rights
• Critical Infrastructure
• Power Grid as defined in Government Code 423
Questions and Comments
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www.nctcog.org/legislative
NCTCOG INCIDENT MANAGEMENT
2020 EQUIPMENT PURCHASE
CALL FOR PROJECTS

UAS Safety and Integration Task Force Meeting

Camille Fountain
North Central Texas Council of Governments
October 30, 2019
NCTCOG Incident Management Equipment Purchase

- Purpose: To Assist Partner Agencies in Purchasing Equipment and Technology that Aid in Quick Incident Clearance and Mitigation

- Supports Current Incident Management Training Recommendation to Use Best Practice Equipment and Technology

- Emphasizes Importance of Implementing Incident Management Strategies and Training
Funding Availability/Requirements

- $1.5 Million Available

- Funding Split:
  - 66% Eastern Sub-Region = $990,000
  - 34% Western Sub-Region = $510,000
  - Local Match – TDCs

- FHWA Buy America Compliance Requirements for Equipment Made with Steel or Iron - 100% of Steel or Iron Should be Made in America

- Where Appropriate, NCTCOG Proposes to Lead Procurement Activities in an Effort to Eliminate Risk of Buy America Non-Compliance
Proposed Eligible Recipients and Activities

**Eligible Recipients**
- Public Sector Partner Agencies within the NCTCOG 10-County Nonattainment Area Actively Involved in Incident Management
  - Police, Fire/EMS, Courtesy Patrol, Etc.
- Completion of Sub-recipient Risk Assessment

**Eligible Activities**
- Purchase of Equipment and Technology Used in Mitigating Crashes
  - Examples include: traffic barriers, cones, flares, protective clothing, signs, cameras, lighting, crash reconstruction technology, etc.

**Possible Pilot Project**
- NCTCOG May Consider Requests to Purchase Equipment Used to Provide Blockage During Incident Response (e.g. Crash Barriers, Attenuators, etc.)
  - Special Pilot Project Would be Funded Using a Different Funding Category

**Ineligible Activities/Purchases**
- Personnel and Staffing Charges
- Vehicle Purchases (Due to Lack of FHWA Buy America Exemptions for Vehicles)
<table>
<thead>
<tr>
<th></th>
<th>Eligible Equipment/Technology - Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Incident Detection and Notification Equipment (Dynamic Message Boards, Radios, TMC Equipment, Thermal Imager, etc.)</td>
</tr>
<tr>
<td>2</td>
<td>Traffic Control and Scene Management Equipment (Cones, Flares, Signs, Lighting, Safety Gear, Vehicles, Opticom Emitters, Push Bumpers, and Transit Clusters, etc.)</td>
</tr>
<tr>
<td>3</td>
<td>Accident Investigation/Reconstruction Technology</td>
</tr>
</tbody>
</table>
## Proposed Scoring Criteria

<table>
<thead>
<tr>
<th>Scoring Component</th>
<th>Available Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIM Training Attendance - NCTCOG or In-house <em>(Since August 2013)</em></td>
<td>15</td>
</tr>
<tr>
<td>Crash Data in Jurisdiction</td>
<td>10</td>
</tr>
<tr>
<td>Adoption of Incident Management Resolution</td>
<td>10</td>
</tr>
<tr>
<td>Incident Management Goals/Targets in Place</td>
<td>5</td>
</tr>
<tr>
<td>Completion of Incident Management Commitment Level Survey</td>
<td>5</td>
</tr>
<tr>
<td>Adoption/Implementation of Regional Performance Measure Standard Definitions</td>
<td>5</td>
</tr>
<tr>
<td>Explanation of How Equipment will be Used to Mitigate Crashes</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total Score</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>DATE</td>
<td>ACTION</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>September 2018</td>
<td>STTC (Action Item) – Request Approval to Conduct CFP</td>
</tr>
<tr>
<td>October 2018</td>
<td>RTC (Action Item) – Request Approval to Conduct CFP</td>
</tr>
<tr>
<td>October 2019</td>
<td>TIM Funding Agreement Approved</td>
</tr>
<tr>
<td>October 2019</td>
<td>STTC (Action Item) – Request Approval to Conduct CFP</td>
</tr>
<tr>
<td>November 2019</td>
<td>RTC (Action Item) – Request Approval to Conduct CFP</td>
</tr>
<tr>
<td>December 2019</td>
<td>Open Call for Projects (60 days)</td>
</tr>
<tr>
<td>January 2020</td>
<td>Close Call for Projects</td>
</tr>
<tr>
<td>Feb. 2020 – March 2020</td>
<td>Evaluate Submitted Projects</td>
</tr>
<tr>
<td>March/April 2020</td>
<td>RSAC and Public Meeting (Info) – Present Proposed Selected Projects</td>
</tr>
<tr>
<td>April 2020</td>
<td>STTC (Action) – Approval of Selected Projects</td>
</tr>
<tr>
<td>May 2020</td>
<td>RTC (Action) – Approval of Selected Projects</td>
</tr>
<tr>
<td>June 2020</td>
<td>Executive Board Meeting</td>
</tr>
</tbody>
</table>
Partner Agency Input

Incident Management Commitment Level Survey

➢ Seeking New Project Ideas for Crash Reconstruction Software/Technology
  ○ [https://www.surveymonkey.com/r/VPPVNDX](https://www.surveymonkey.com/r/VPPVNDX)

20. Are There Any Hardware, Software, Training or Other Needs to Assist Your Agency In Responding To and Clearing Incidents More Safely and Efficiently?*
   If Yes, Please Provide Examples of What is Needed in the Comment Box Below.

   ○ Yes
   ○ No

Examples:
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