Unmanned Aerial Systems and Infrastructure Inspections (Drones)
Current Methods
Usage

- Replacing expensive access when hands-on is not always needed
- When hands-on is never done due to return on investment or dangers
- When time constraints prevent current methods of access
- Provide overview prior to plan more expensive means of access
- Confined space entry
Bridges, Overlane signs, High Mast Light Poles, Other High Ancillary Structures

Structure inspections are expensive, dangerous, and time consuming.

Drones will make inspections cheaper, safer, and faster.

Drones do not replace inspectors or engineers. Drones acquire visual imagery in order to focus and expedite the inspection.

Subject to weather, limited use over traffic
Unique challenges associated with inspection drones.

Do you want:
- GPS?
- Infrared?
- Ultrasound?
- LIDAR?
- Microwave?
- Laser range finders?

We can do that. But remember...
UAS Design

- It still has to fly under a bridge!

- Size is a critical limitation, and bridges block GPS signals.
Scout UAS

- Collects high-resolution visual imagery in confined spaces.
- 15 minutes of flight time, 5 minute turnaround time.
- Not dependent on GPS.
- Up to 20 megapixel/10x optical zoom images.
- Independent camera operator station with full control of camera gimbal, zoom, focus, and shooting mode.
- LED spotlight.
- Portable charging station enables all-day flying.
Additional UAS

- Cinestar Heavy Lift.
- Capable of carrying more sophisticated payloads.
Additional UAS

- “Think you can fit in there?”
- “Uhh... let me grab the Phantom.”
Operations

- Planning Phase
  - Air traffic Control
  - Law Enforcement
  - DHS Coordination
  - Local residents
  - Spectator Control
  - Identify additional resources, i.e. a boat.
Safety

– Military aviation based safety program
– Checklists: “Did you hit record?”

### Risk Assessment Worksheet

<table>
<thead>
<tr>
<th>HAZARD</th>
<th>CONTROL</th>
<th>PROBABILITY (LOW/MED/HIGH)</th>
<th>SEVERITY (1-4)</th>
<th>GO/NOGO</th>
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Severity: 1 = normal operations; 2 = potential damage to equipment; 3 = potential damage to property; 4 = potential injury.
Hazard with a severity of 3-4 must be controlled to "LOW" probability.

### Safety Brief

I. Preflight Planning
   - Air Traffic Control Coordination
   - Local Law Enforcement Coordination
   - Local Resident Coordination
   - Spectator Control Measures
   - Risk Assessment Worksheet

II. Client Brief
   - Mission Overview:
     i. Big to small
     ii. Line of sight
     iii. Launch and recovery zones
   - Minimum safe distance: 20'. Do not stand directly beneath the UAS.

   - Designated spotter:
     i. Obstacles
     ii. Interlopers
     iii. Aircraft

   - Frequency Interference Prevention:
     i. Wi-Fi/Bluetooth
     ii. Radios/Walkie-Talkies
     iii. Video transmitters

III. Questions?
Insurance

- General SkyCam carries $1,000,000 liability coverage

- Illegal Acts Exclusion Clause
Judge ruled FAA cannot enforce laws that don’t exist.
- Model aircraft regulations
- Section 333 Exemptions
- COAs
- Academic SAO safety code
- Proposed regulations
  - UAS less than 55lbs
  - Line-of-sight only
  - Daylight only
  - Max airspeed 100mph
  - Below 500’ AGL
  - At least 17 years old
  - Must pass FAA UAS operator course

- General SkyCam Strategy
  - Abide by model aircraft regulations and proposed regulations.
  - Exercise sound judgment.