Aerial Imagery for Transportation Past, Present, and Future
Traditional Aerial Imagery

- Fixed Wing Aircraft with Port
- Large format film or digital camera - RGBNIR
- Semi-Automated Workflow
- 3-inch pixel resolution
- Horizontal – 8-inch
- Ability to fly over purposed or existing corridors
- Proven Platform
- Moderate cost
Traditional Aerial Imagery
Traditional Aerial Imagery

![Image of aerial view](image-url)
Traditional Aerial Imagery
Traditional Aerial Imagery
Traditional Aerial Imagery

• Low Altitude Mapping Photography
  – Helicopter -Large format film or digital camera - RGBNIR
• Semi-Automated Workflow
• 1.5-inch pixel resolution
• Horizontal – 4-inch
• Ability to fly over purposed or existing corridors
• Proven Platform
• Higher cost
Traditional Aerial Imagery
Traditional Aerial Imagery
Traditional Aerial Imagery
Traditional Aerial Imagery
Future Aerial Imagery

• UAS – Fixed Wing or VTOL
• .7-inch pixel resolution
• Ability to fly over purposed or existing road corridors
• New Platform
• Low cost
“The Exemption”

In December 2014 Woolpert received approval from the FAA regarding an exemption seeking relief from selected requirements of Title 14 of the code of federal regulations concerning operation of an unmanned aircraft system over the state of Ohio pursuant to Section 333 of the FAA Modernization and Reform Act of 2012

[ First mapping & survey firm in the U.S ]
The Exemption… Translated

• UAS are so new that not all of the existing aviation regulations from the FAA are applicable
• We received exemptions from those that are not applicable
• We provided the FAA with operational and technical UAS information such that the FAA determined our activities would be safe for the national airspace and society in general
• Approval is for a specific make and model of aircraft
• Yes, the UAS are considered aircraft … tail number RW937
Recent “Blanket” COA

• FAA established an interim policy to speed up airspace authorizations for commercial UAS operators who have already obtained Section 333 exemptions in the form of an automatic COA for flights at or below 200 feet, across the United States, with some conditions

• This eliminates the wait time and expense of a COA process for those projects suited to a flying height of 200 ft. of rural areas.
Amendments?

• Filed three amendments so far:
  – Permission to use a private pilot – Approved
  – Permission to fly near airports, with coordination - Approved
  – Permission to fly alongside major roads and highways - DENIED
Where can we Fly?

Regarding our 333...

• 5 miles from airports, helipads and landing strips
• Not over populated places (simple example: cities, towns)
• 500ft from non-participating objects and people (FAA rule)
• 300ft offset from major roads (@400AGL)
• For now that means flying in rural areas
Altavian Nova Block III

- Platform: Fixed Wing
- Endurance: 90 min
- Cruise Speed: 35 mph
- Max Speed: 70 mph
- Altitude Max.: 1000ft AGL
- Wing Span: 108 inches (9ft)
- Length: 67 inches (5.5ft)
- Weight: 15 lbs. maximum takeoff weight (MTOW)
- Camera – Nikon 2cm Pixel resolution -RGB
- Horizontal – 4-inch
- Automated Workflow
Altavian Nova Block III
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Altavian Nova Block III
Kespry

- Platform: VTOL (vertical take off and landing)
- Linear Range: 50mi
- Endurance: 35min
- Cruise Speed: 9-18 mph
- Max Speed: 30 mph
- Altitude: 50-400ft AGL
- Width: 30 in
- Height: 8 in
- Weight: 4.5 lbs VTOL
- Camera – Sony 2cm Pixel resolution - RGB
- Horizontal – 4-inch
- Automated Workflow – In the Cloud
Kespry
Kespry
UAS Sensors

- **LiDAR - Riegl VUX-1**
  - Survey-grade accuracy & precision typical 10 mm
  - Scan speed up to 200 scans/second
  - 7 lbs.
- **Hyperspectral – Headwall Photonics**
  - +/- 300 bands
  - 2-3nm band width
  - 400nm-1000nm range
  - 1.5LB
Present Aerial Imagery

- Renaissance System (proprietary)
- Standard Fixed Wing Aircraft with transferable pod
- Produces the same resolution as UAS Nikon 2 cm digital camera - RGB
- No UAS restrictions
- Semi-Automated Workflow
- .7-inch pixel resolution
- Horizontal – 4-inch
- Ability to fly over purposed or existing road corridors
- New Platform
- Low cost
Renaissance System
Renaissance System
Renaissance System
Renaissance System
Automated Processing UAS- Renaissance

- Amazon Cloud Based
- Mosaicked Imagery
- Digital Surface Models
- 3-D Renderings
- Data can be used for feature extraction
Point Cloud
Aerial Imagery for Transportation

• Traditional
  – Industry Accepted
  – Requires separate aerial and survey mobilization
  – Moderate cost

• Renaissance System
  – New to Industry
  – Requires separate aerial and survey mobilization
  – Low cost

• UAS
  – Existing Corridors Coming Soon
  – Requires separate aerial and survey mobilization
  – Low cost
  – Combined with MMS
Questions?

Renaissance Imagery
Site: maps.woolpert.com
Login: renaissance demo
Password: highres