CURRENT UAV EQUIPMENT

DJI Phantom 4 Pro
• Aircraft weight < 55 pounds
• Certified Pilot
• Daylight or Civil Twilight
• < 400 feet AGL
• Class G airspace
• Within unaided line of sight
• Visibility 3 miles or more
• No flights over non participants
CURRENT APPLICATIONS

• Imagery/Videography

• Inspections:
  • Aircraft Beacon
  • Rockfall Sites
  • Construction Sites

• Mapping- Topo Surveys

• Modeling- 3D terrain models

• Stockpile Measurements
Dearborn River High Bridge. Photo taken 1 week before 25+ Ton vehicle crossed. Bridge is rated at 7 Tons.
Beartooth Pass Condition Inspection prior to Snow Removal Operations
PUBLIC RELATIONS
MAPPING
MAPPING

Vertical RMS of 0.078’
and NSSDA accuracy of 0.153’.

(Currently, MDT Photogrammetry targets 0.3’ or better NSSDA)
Rock Slope was modeled and rock scaling quantities were derived for the contract.
### SCALING

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<th>STATION</th>
<th>SCALING</th>
<th>cubic yards</th>
<th>REMARKS</th>
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LITTLE DRY CREEK

• Mapped ~3400 feet of project
• 734 images
• 10 control points
• Two 18 minute flights
POST PROCESSING SOFTWARE

Pix4D

Virtual Surveyor
Little Dry Creek

Check stations every 500’
NSSDA accuracy .16’ on pavement.

Accuracy of vegetated areas heavily dependent on post processing software and skill level. We have a lot to learn still.
Not an MDT application but the technology is being used to accurately map crash scenes.
NEXT STEPS...

• Survey Grade GPS units

• 2 additional UAVs - DJI Inspire 2

• Develop Workflows for Preconstruction Mapping

• Construction Projects – Earthwork Measurement
FUTURE

• Fixed Wing
• LIDAR
• Machine Learning / Artificial Intelligence to optimize data processing
FUTURE

• Thermal imagery
• In-service Bridge Inspection
• Beyond Line of Sight Operations