GIS, Drones, Reality Capture

Cody Kutil | Drone and 3D Scanning Services Lead

Alex Johnson | Solution Architect

wsb
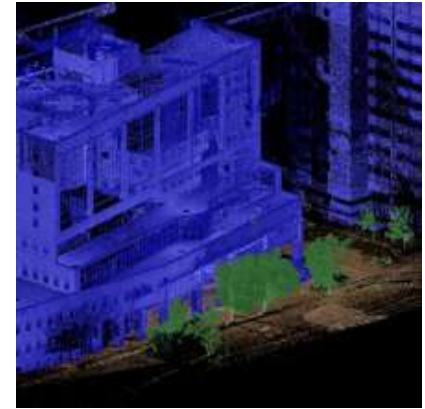
Reality Capture

360 Street View

Drone

Indoor Scanning

3D Scanning

Benefits of Reality Capture

Safety	Collaboration	Cost Reduction	Asset Management

Drone Capabilities

- Aerial Photography & Videography
    - Geospatial Documentation
    - 360 Degree Imagery
- High Resolution Imagery
- Reality Captures (3D modeling)
- Traffic Analysis
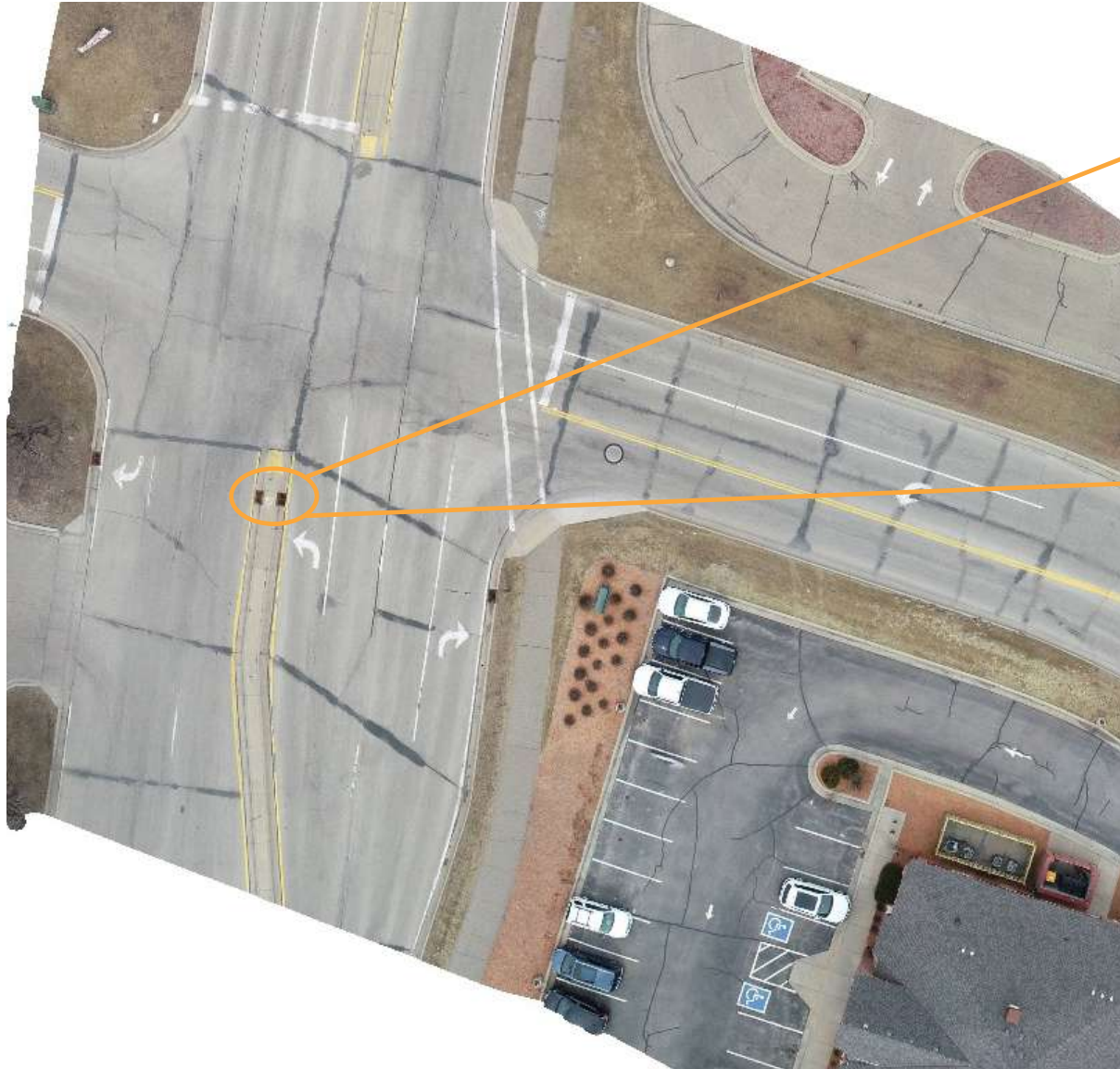- Planimetric Drafting
- Live Inspection

Aerial Photography & Videography

- Simple photos ideal for documentation to edited compilation marketing videos

360 Air

- Easily accessible, up-to-date visual documentation

- Allows users to pan, zoom, and tilt around the photosphere

High Resolution Imagery

- Geospatially Accurate
- Easily Reproduced
- Imagery can be used as a basemap or used for planning/design purposes
 - AI Auto Drafting

Drones & Reality Capture

- Cost-effective data acquisition

- Large sites/repeated surveys

- Captures a significant amount of data vs traditional survey

- Achieves similar accuracies

- Feeds not only design but GIS & Asset Management

Reality Capture

- Construct to-scale reality models using photogrammetric mapping and AI software
- Create accurate 2D and 3D calculations without expensive mapping software.
- When flown multiple times, we can compare surfaces and generate earthwork calculations
  - Before and After of a project
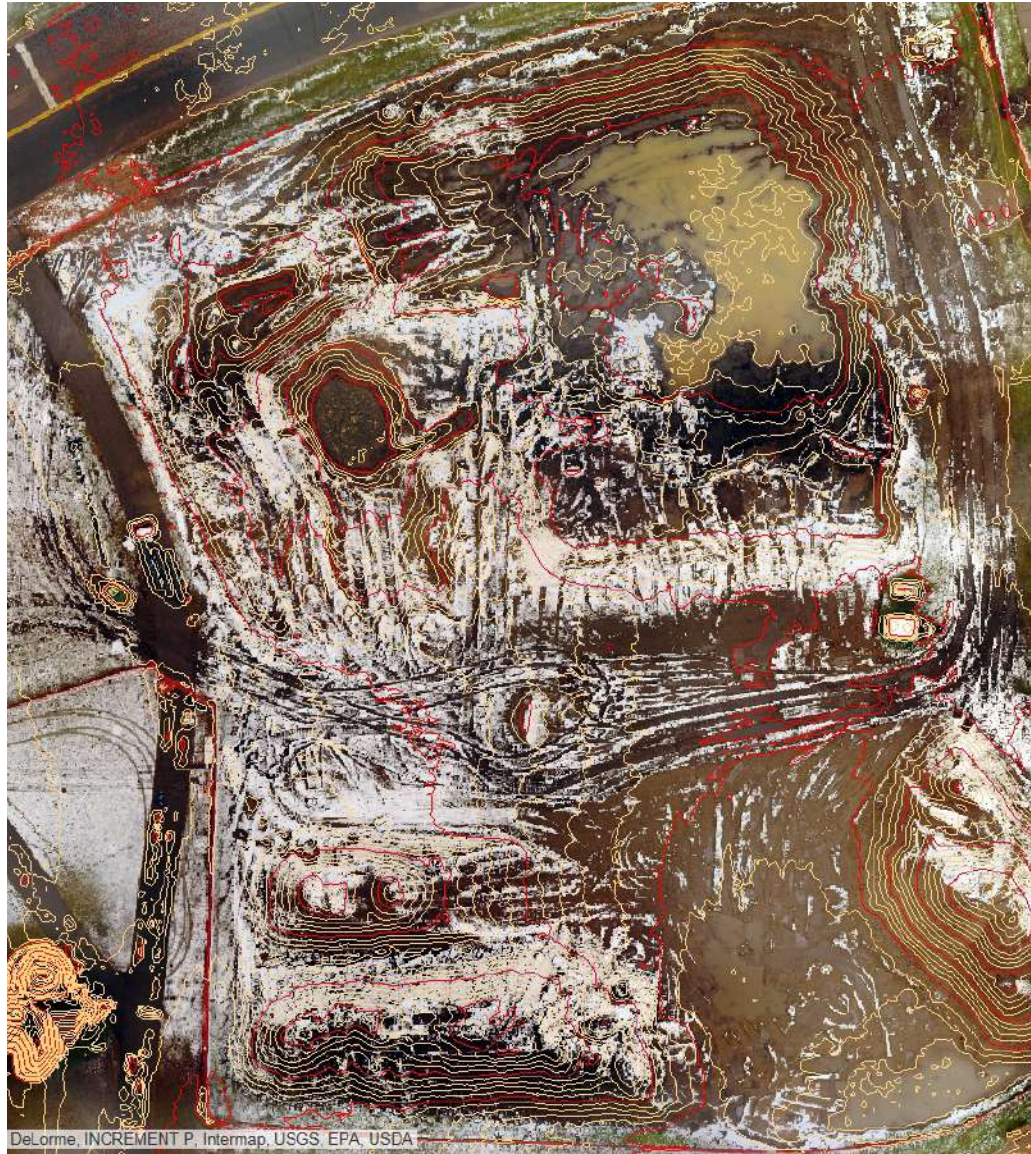
DeLorme, INCREMENT P, Intermap, USGS, EPA, USDA

Drone Data Outputs

- 3D Reality Mesh (3D imagery)
  - Local or Web Based
- 2D contour/topography
- DEM / DTM / DSM (surface models)
- Planimetric features
- Orthophotos

Reality Capture Design
Integration

Traffic Analysis

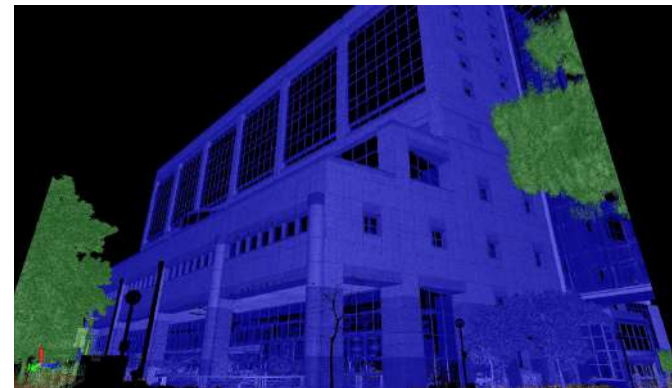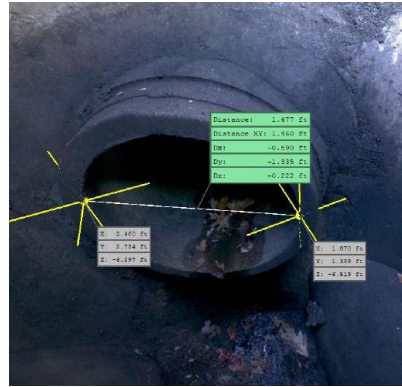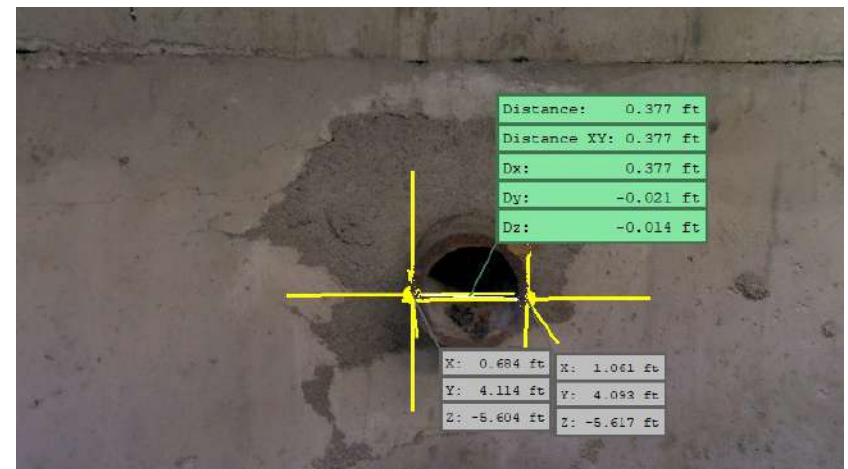# AI Driven Planimetric Data

Live Inspection

Reality Capture / 3D Scanning

- Quickly capture accurate site data
- Reality mesh is becoming the new standard
- Connect directly to the digital design process
- Variety of tools / processes available
- Better speed, usability and accuracy
- Improves AMS capabilities

Survey Grade 3D Scanning

Manhole Scanning

360 Street View

- Drive 360-degree high resolution imagery

- Can be uploaded to Google Street View

- Driven at highway speeds of 45 to 65 mph

- Detects, classifies, and maps objects/assets

360 Object Detection

360 Object Detection

- Guardrails

- Markings

- Street Lights

- Pavement Distress

- Street Lights

- Hydrants

- Mail boxes

360 Object Detection – Complete List

Point Features – 42 types of object

- Temporary Barrier
- Crosswalk - Plain
- Driveway
- Lane Marking - Arrow (Left)
- Lane Marking - Arrow (Right)
- Lane Marking - Arrow (Split Left or Straight)
- Lane Marking - Arrow (Split Right or Straight)
- Lane Marking - Arrow (Straight)
- Lane Marking - Crosswalk
- Lane Marking - Give Way (Row)
- Lane Marking - Give Way (Single)
- Lane Marking - Other
- Lane Marking - Stop Line
- Lane Marking - Symbol (Bicycle)
- Lane Marking - Text
- Banner
- Bench
- Bike Rack
- Catch Basin
- CCTV Camera
- Fire Hydrant

- Junction Box
- Mailbox
- Manhole
- Parking Meter
- Phone Booth
- Signage - Advertisement
- Signage - Information
- Signage - Store
- Street Light
- Pole
- Traffic Sign Frame
- Utility Pole
- Traffic Cone
- Traffic Light - Cyclists
- Traffic Light - General (Horizontal)
- Traffic Light - General (Single)
- Traffic Light - General (Upright)
- Traffic Light - Other
- Traffic Light - Pedestrians
- Trash Can
- Water Valve

Traffic Signs

Can identify and categorize more than 1.500 different traffic signs. Some of the more common ones are

- Stop Sign
- No Parking
- Yield
- Speed Limit

- Railroad Crossing
- Pedestrian Crossing
- Do Not Enter
- No Turn

- All Regulatory Signs
- All Warning Signs

Linear Features – 19 object classes

- guardrail
- service lane
- sidewalk
- traffic island
- dashed lane marking
- solid lane marking
- bike lane

- curb cut
- parking
- rail track
- road
- road shoulder
- curb

- fence
- other barrier
- separator
- vegetation
- snow
- water

360 Object Detection – Pavement Analysis

360 Object Detection – Pavement Analysis