Data Fusion: Merging Public Domain and High Accuracy Mobile Lidar to Address Budget Constraints

Paul Braun – Vice President
Offices:

- Madison, WI (HQ)
- Indianapolis, IN
- Kansas City, KS
- St. Louis, MO
- St. Paul, MN

Philosophies:

- Right sensor / platform for the job
- Project centric geospatial data creation
- Aggregators and consolidators
Mobile Lidar
Mobile Lidar

GPS

Laser

Video
Challenges

• Accuracies dissipate quickly off of hard surfaces
• Coverage is difficult off of hard surfaces – drainage ditches can be problematic
• ROW-to-ROW mapping is not feasible

Technical Approach

• Integrate public domain aerial lidar
• Compare to mobile and adjust
• Integrate with fresh collect
End Client: Indiana DOT

Project Purpose: Pavement improvement of 5 miles of I-469

Infrastructure Concerns:
- Transverse cracks, pot-holing, and pavement failures
- High water tables and inadequate sub-grade drainage led to loss of structural strength in the sub-base
- Need to understand drainage

Requirements:
- Digital surface model for all paved surfaces
- X-section every 10 feet along roadway with pts every foot along the X-sec
- High accuracy 3D data (0.10’ vertical accuracy)
- Bridge clearances for each lane
- Planimetric mapping on hard surfaces
- Topographic mapping ROW-to-ROW
Project #1 – I-469
Project #1 – I-469
Project #1 – I-469

Public domain lidar
Project #1 – I-469
Project #1 – I-469
Mobile lidar
Project #1 – I-469
Project #1 – I-469
Integration Process

- Re-project aerial lidar to project coordinates
- Buffer roadway by 500’ and clip the aerial lidar
- Shoot a point along the road about every mile
- Compare elevation between mobile and aerial
- Derive an adjustment to the aerial based on the delta
  - Aerial lidar tends to be pretty tight to spec vertically
- Bulk edit the aerial lidar data
- Validate via spot checks
Project #2: I-94 & US-421

End Client: Indiana DOT
Location: Michigan City, IN
Project Purpose: Bridge inspection, road design, bridge rehab, and construction services for 7 miles of I-94

Infrastructure Concerns:
• Drainage concerns
• Extremely busy roadway

Requirements:
• Digital surface model for all paved surfaces
• X-section every 10 feet along roadway with pts every foot along the X-sec
• High accuracy 3D data (0.10’ vertical accuracy)
• Bridge clearances for each lane
• ROW to ROW mapping
Project #2: I-94 & US-421
Project #2: I-94 & US-421
Project #2: I-94 & US-421
Project #2: I-94 & US-421
Project #2: I-94 & US-421
Project #2: I-94 & US-421
Continental Mapping is hiring!

Paul Braun
Vice President
pbraun@continentalmapping.com
888.815.3327