MOBILE MAPPING

GeoSmart Asia – Locate 18
ESP Associates, P.A.
ABOUT ESP

• Founded in 1986 (28 Years of Experience with DOT’s)
• ESP has 14 offices throughout the US
• 37 States, Canada, and Australia
• 400 employees
• ENR 500 (#299)
• Began Mobile Mapping in 2010
• Improve efficiency by capturing the most possible data at traffic speeds in a single pass
• Fully synched and georeference the data from multiple sensors
• Capture data that is relevant for GIS and Survey applications
• Extract intelligent information by automated means to the fullest extent possible
• Efficiently manage terabytes of data
  – Get it to a level that the client is comfortable
• Value Added Data – Collect Once use Many
• Safe Work Zone – NO ONE IN THE ROADWAY!
TRIMBLE MX 8 MOBILE SYSTEM
Trimble MX8 Components

- 2 - VQ 250 Lasers
- 6 – 5 megapixel cameras
- 1 - Applanix POS LV420 IMU
- 2 – Trimble GNSS GPS Receivers
- 1 – DMI unit
RIEGL VMX-1HA
• Riegl VMX-1HA
• Applanix POS LV 610 Inertial Measurement System (IMU)
• 2 Riegl VUX-1HA lasers 1 million points per sec X 2 (2,000,000/sec)
• 4 Riegl 5mp cameras
• 1 Flir Ladybug 5 30 mp camera
• 1 Nikon D-800 36 mp DSLR (High Res Photos)
Trimble MX8 Upgrades
• Detachable Hy-Rail system
• Dalsa Spyder Pavement Imaging Camera
• High Intensity Light Bar
• IR Illuminator
• Ladybug5
Trimble MX8 Upgrades
• Dalsa Spyder Pavement Imaging Camera
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Data Asset Extraction

- Sign / Pole Inventory
- Infrastructure Inventory
- Bridge Clearances
- Lane Markings
- Walls
- Bulkheads
- Utility lines
- Oblique LiDAR and Photo

Pavement DTM Details
Hydroplane Detection
Roadway Cross Sections
Asbuilt – Existing Condition
Floodplain Mapping and Risk Analysis
Storm Inventory
Hi-Rail Surveys
SUE designation location
LIDAR / PHOTOS = PRODUCTION
I 77 - I 277 – I 485 – I 85 MOBILE MAPPING
APPLICATION: PAVEMENT CROSS SECTIONS
Eagle P3 Commuter Rail

Denver, CO

1.5 days on site for the scanning. 200 hours for survey control (every 2500’)

Conventional survey estimated at approx. 3000 hours

Scanning was complete in 18 hours

Extraction is on going (Still mining the data)

No additional software was needed for the design team

Scan data is transferred via external hard drives. 23 mile project equaled 500 GB (1/2 TB) of data

Additional tasks can be identified at a later date with no re-mobilization to the site. Example: Bridge clearance heights.
EAGLE P3 PROJECT

Eagle P3 Commuter Rail - Denver, CO
At Grade Crossing
EAGLE P3 PROJECT

Eagle P3 Commuter Rail - Denver, CO
Georeferenced Photos
Eagle P3 Commuter Rail - Denver, CO

Encroachments
EAGLE P3 PROJECT

Eagle P3 Commuter Rail - Denver, CO
Rail Extraction
ASBUILT – MODEL
Extraction of Assets using Photogrammetry only or LiDAR only or both simultaneously
APPLICATION: BRIDGE CLEARANCES
INFRASTRUCTURE ASSETS MAPPING
Pioneer in Efficient FFE Collection Methods
APPLICATION: TUNNELS
NOISE RETAINING WALLS

- Beginning of Wall
- Step in Wall
- Corner of Wall
- End of Wall
MID-SPAN CLEARANCES
ACCURACIES

Scalable

- Function of the GNSS, Control, Surface, Foliage
- Function of the project – be practical

MX8 – Max control < 1 cm (200 – 500 m)
Control at 1200 – 1500 m spacing = 2 cm
Kinematic GPS = 5 – 7 cm or more*
  - more of a function of the Base Station
DELIVERABLES

CAD or GIS Product
- Main Production Tool = Trident Trident
  - MicroStation
  - TopoDOT
  - AutoCAD
  - ArcGIS
- ESP Analyst
- TIN or DTM surfaces
- Contours
- Cross Sections
- Databases
- Shapefiles
- Standard Forms
THANK YOU
QUESTIONS?