



# Orbit: The Total Visualization Package

CEC Infrastructure Solutions

Bryan Salsieder, GISP





# COMPANY PROFILE



Get Stuff Built Right  
Relationships | Communities | Families

[CONNECTCEC.COM](https://connectcec.com)

CEC

OKLAHOMA | TEXAS





# WHAT WE DO



- Transportation Design
- Surveying & Mapping
- Power Delivery
- Materials Testing
- Environmental Resources
- Bridge / Structural Design
- Construction Management
- Airport Design
- Land Development
- Mechanical / Electrical





# THE TEAM



**Bryan Salsieder**  
GIS Specialist



**Bartley Estes**  
LiDAR Manager



**Tyler VanWinkle**  
LiDAR Technician



**Emily Williams**  
LiDAR Technician





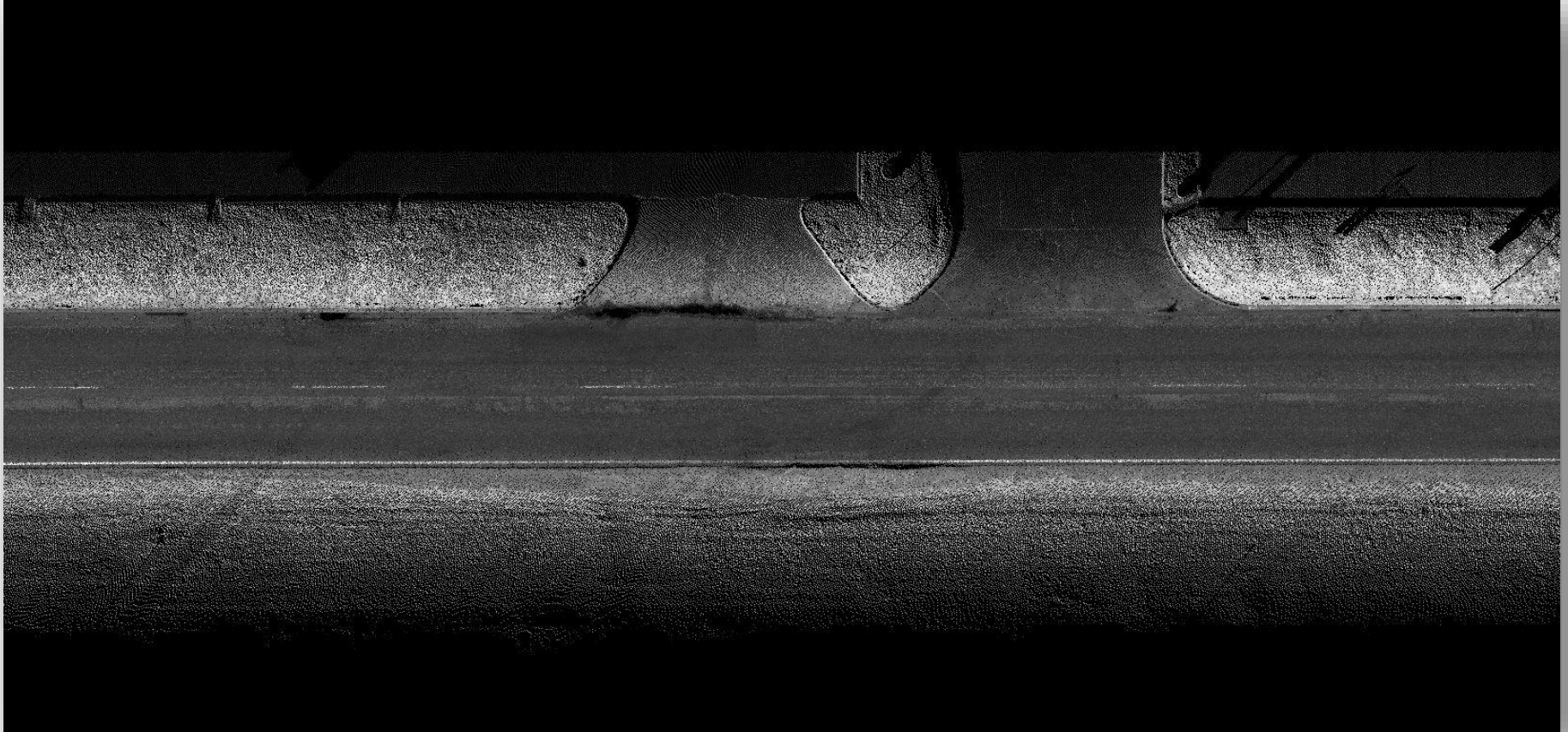


# MOBILE LIDAR

- Used mainly for high density, high accuracy corridor scans.
- CEC began using LiDAR in June 2012.
- Purchased our unit in January 2013.
- Optech LYNX M1 system attached to vehicle.
- 1 million points/sec at +/- 4mm accuracy.
- Data can be processed into highly accurate topographical drawings of breaklines, terrain modeling, drainage, and above ground utilities.
- Increasingly used for pavement condition analysis.



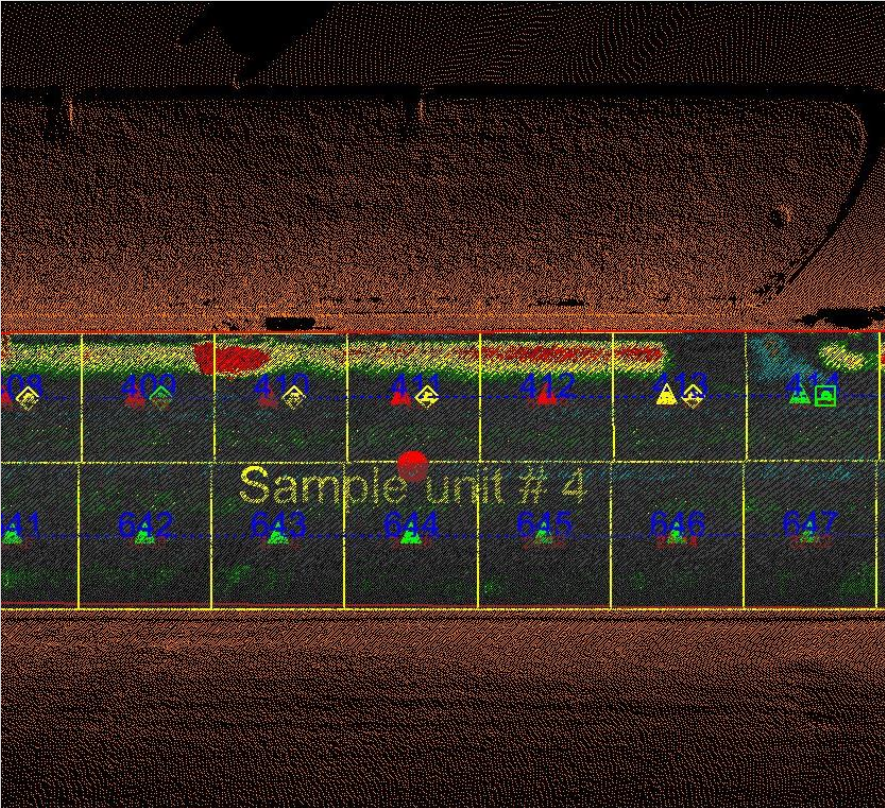
# PAVEMENT ANALYSIS







# PAVEMENT ANALYSIS



Sample Unit	Rating	PCI	Volume Below	Volume Above	Avg. Rutting Depth	Max Rutting Depth
1	Failed	4	18.84300027	0	0.034894332	-0.012533082
2	Poor	47.11	8.24692854	0	0.027621693	-0.016323054
3	Very Poor	37.08	18.29219177	0	0.039679052	-0.027076801
4	Serious	10.38	29.51613726	0	0.05171179	-0.029898464
5	Very Poor	34.95	14.76336284	0	0.03160191	-0.014780086
6	Poor	48.31	7.456429411	0	0.028073345	-0.001902992
7	Poor	48.26	10.34116375	0	0.030285739	-0.016798589
8	Very Poor	34.53	16.50595945	0	0.037404791	-0.018174989
9	Very Poor	28.84	16.97664507	0	0.036351082	-0.026113132
10	Poor	49.76	10.66453782	0	0.031349463	-0.019022959
11	Very Poor	26.62	17.53706929	0	0.036268735	-0.022200945
12	Very Poor	30.95	14.25716984	0	0.027858739	8.31E-07
13	Poor	48.27	11.73749179	0	0.029785262	-0.021842882
14	Very Poor	36.82	18.10133899	0	0.036690983	-0.021932663
15	Very Poor	38.27	22.07093776	0	0.039844821	-0.031564684
16	Very Poor	39.42	15.86989754	0	0.036677181	-0.026333216
17	Poor	41.33	13.96989523	0	0.033699267	-0.024107884
18	Very Poor	38.15	15.70372049	0	0.036265696	-0.026977156
19	Very Poor	37.82	15.96246884	0.484692726	0.036222384	-0.020049288
20	Poor	40.99	18.92420289	0	0.039692688	-0.025447537
21	Very Poor	31.92	18.34888044	0	0.039383361	-0.02653293
22	Poor	41.88	11.96421095	0	0.031659781	-0.021776844

# BUT WHAT ABOUT ESRI?





# GIS WEB INTERFACE



OKC Pavement Conditions LIDAR Scans by CEC

**Layer List**

**Operational layers**

- Run 6 - Road Blocks
- Run 6 - Bounding Boxes
- Run 7 - Road Blocks
- Run 7 - Bounding Boxes
- Run 8 - Road Blocks
- Run 8 - Bounding Boxes
- Run 9 - Road Blocks
- Run 9 - Bounding Boxes
- Run 6 - Point Cloud
- Run 7 - Point Cloud
- Run 8 - Point Cloud
- Run 9 - Point Cloud



# LADYBUG CAMERA





# BENEFITS SO FAR

- Very quick turnaround for detailed imagery.
- Survey crews have up to date imagery from the field for reference, no longer using Google Street view which may be very outdated.
- Ability to create video fly throughs of roadway construction diversions to meet safety requirements.
- Colorize the scanned point clouds based on the imagery behind it.







# ORBIT OVERVIEW

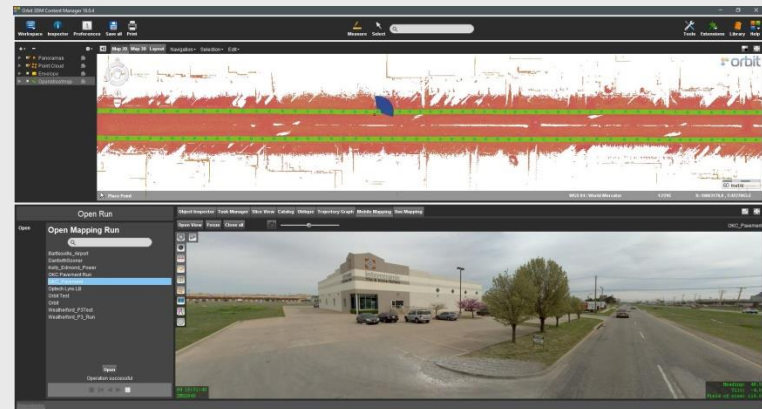
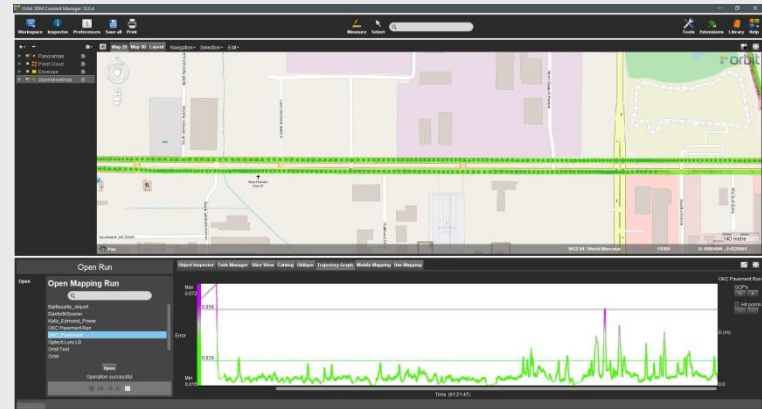
- Orbit GT is a software company based out of Belgium.
- Their prime focus is on 3D mapping solutions combining photography with scanned point clouds.
- An ESRI Silver Business Partner
- Software architecture that requires its own server to store LiDAR data and associated photographs.
- Data is hosted in-house in SQL Server and served on a secure port to be consumed by applications.
- Their software can handle big data very smoothly, perfect for our LiDAR scans and Ladybug photographs.
- Data can be published in HTML and Flash formats, and Plugins are available for ArcGIS, AutoCAD, & QGIS.





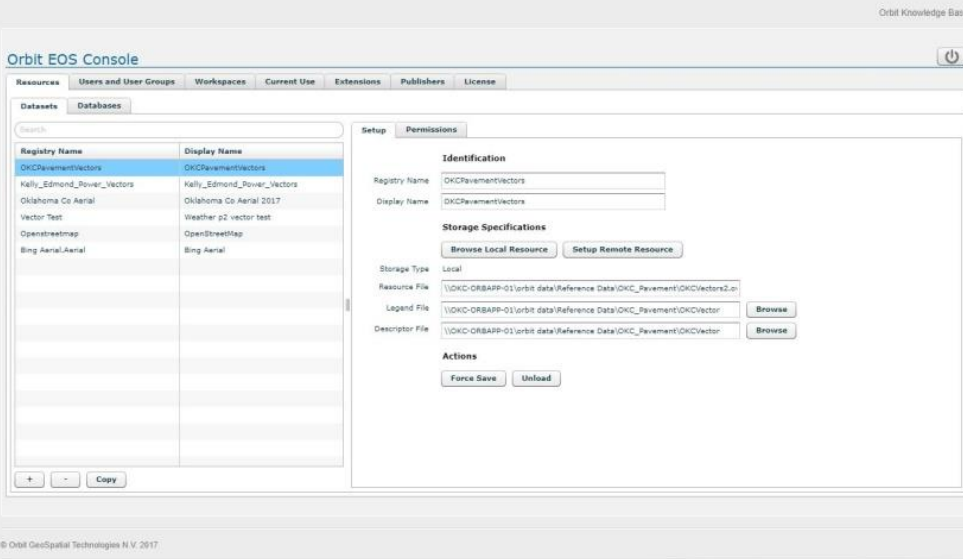
# ORBIT SOFTWARE SUITE

- 3DM Content Manager program for combining panoramic images with the point cloud to create Runs and Projects.
- This works similar to ArcCatalog where files are managed, edited, turned into mosaics, and formatted.
- Ability to correct positional accuracy and have it affect the point cloud and image positions.





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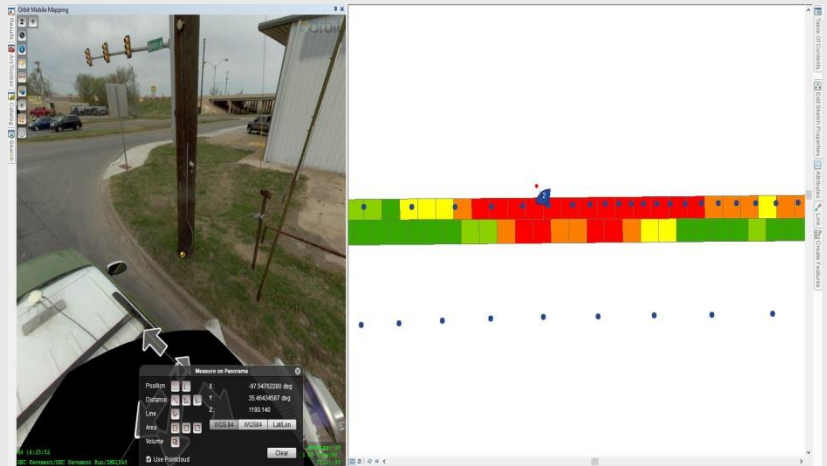
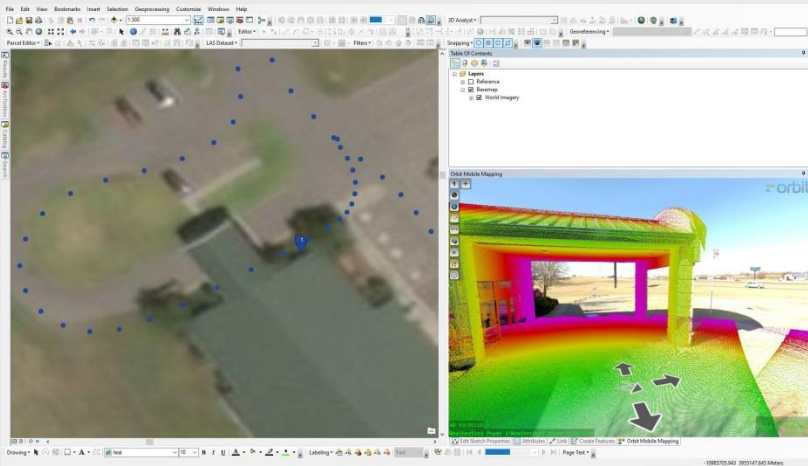


- 3DM Publisher program with a browser based front end.
- Publications work similar to ArcGIS Services published from Server or Portal.
- Vector layers and basemaps are added to Publications as resources.
- [Orbit Pavement Publication](#)





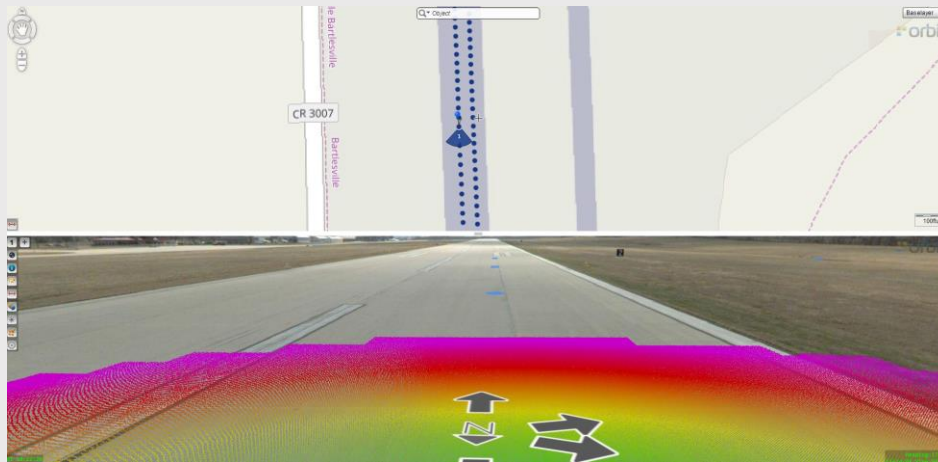
# ARCMAP ORBIT ADD-IN





# FUTURE PLANS

- 3DM Feature Extraction module for Orbit
- Site design and construction progress.
- Access to and development with the Orbit SDK.
- AutoCAD Plugin integration.
- Airport runway condition analysis.





QUESTIONS?

