

Greene County LiDAR Acquisition A Partnership for Better Topography

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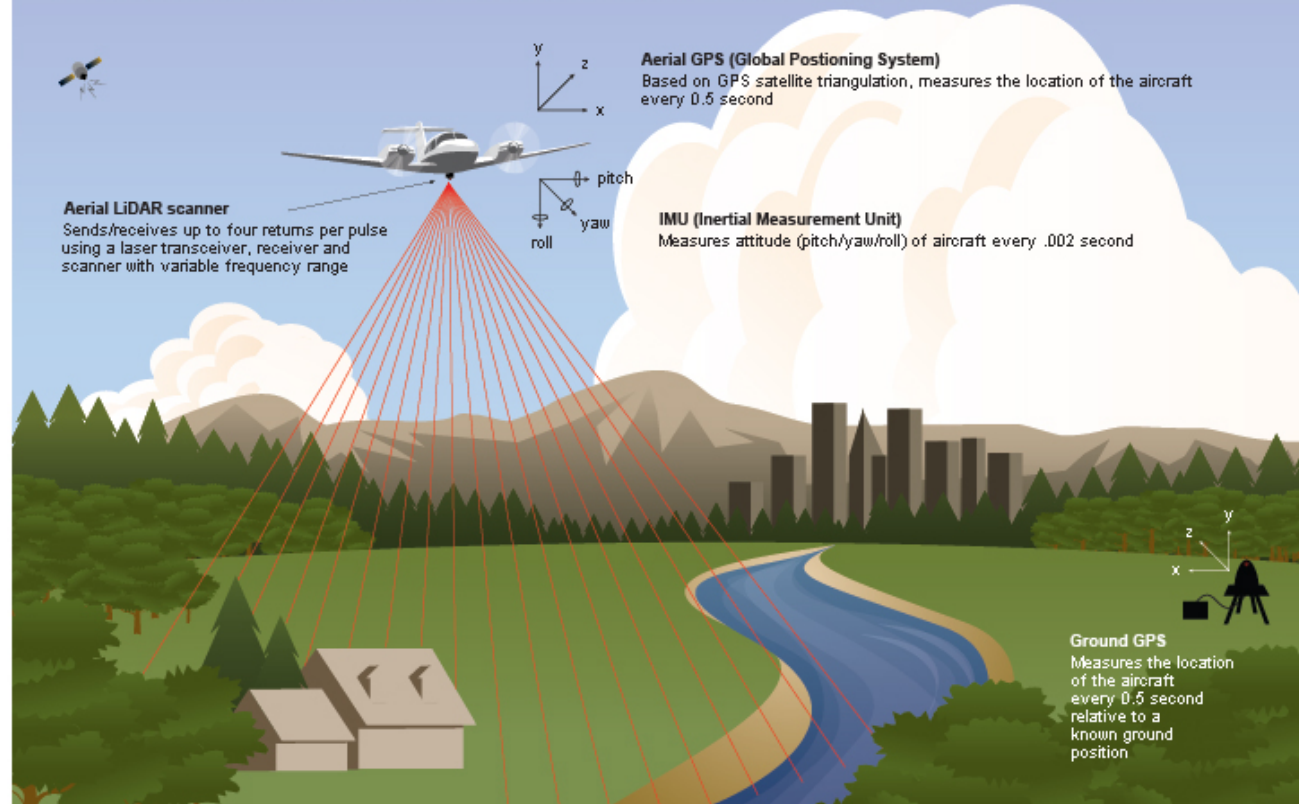
LiDAR (Light Detection And Ranging)

LiDAR: Operating Principles



LiDAR Operating Principles

LiDAR (light detection and ranging) is mapping technology through which a laser is fired at the ground from an airplane to measure distance to the ground. LiDAR was developed as a fast and effective method to gather digital elevation model (DEM) data. With state-of-the-art LiDAR sensors, and many thousands of square miles of data successfully acquired and processed, Sanborn sets the highest standard of accuracy and reliability for LiDAR technology.



Project Purpose

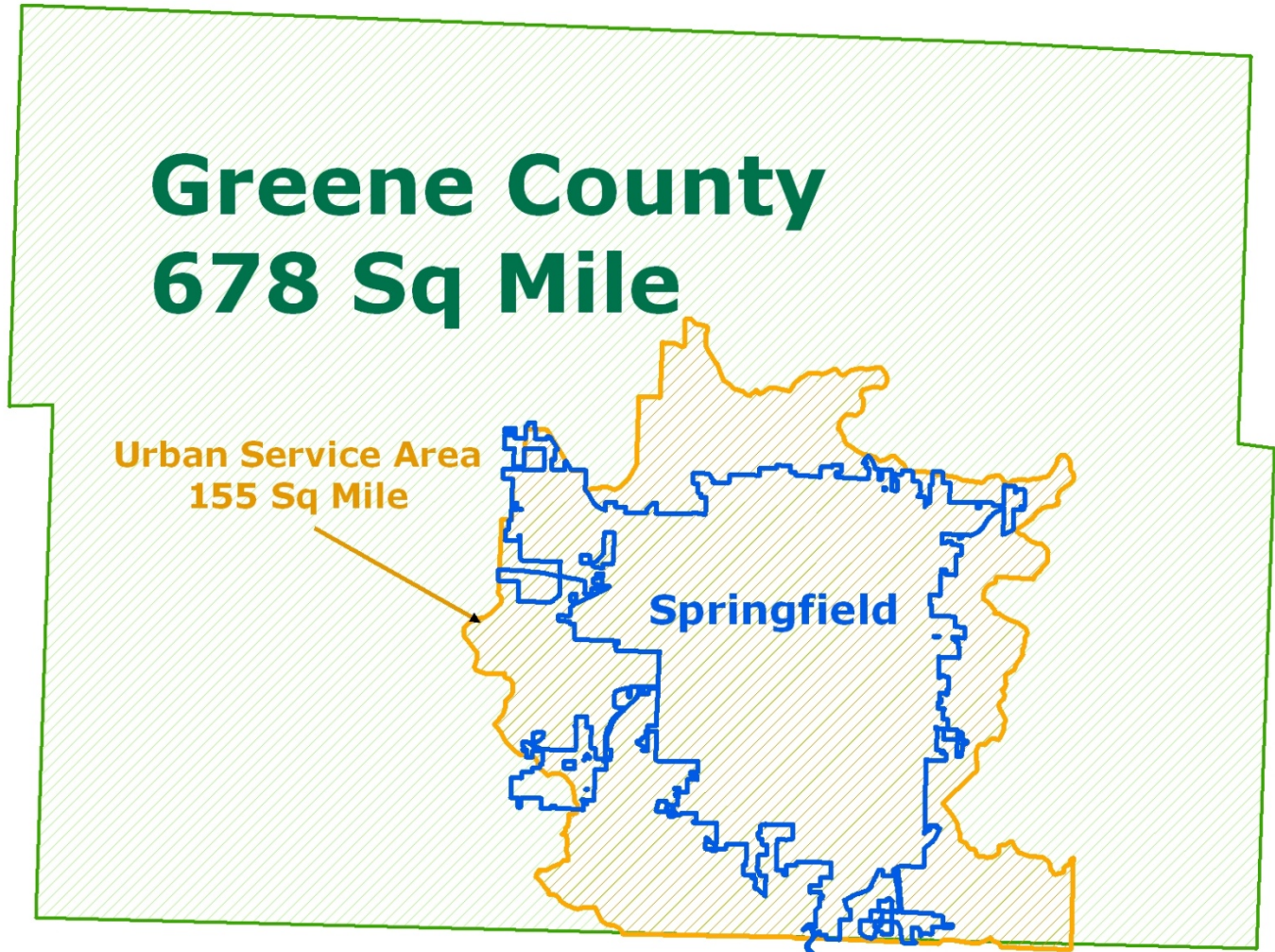
- Acquire LiDAR imagery for all of Greene County Mo (678 square miles)
- Existing 2-ft contours within Springfield produced in 1999. Greene County had no precise digital elevation data
- Partnership between:
 - City of Springfield
 - Greene County
 - USGS
 - US Army Corp of Engineers

Partner Contributions

Greene County
678 Sq Mile

Urban Service Area
155 Sq Mile

Springfield



U.S. Geological Survey (USGS)

- Goal to provide mapping information, such as LiDAR, throughout the US
- Contributed \$75,000 to this project
- Data made available to the public through the USGS web site

U.S. Corp of Engineers

- St. Louis District
- Provides project administration and quality control for a 10% fee
- Administration Includes:
 - A written contract that includes a scope of services tailored to fit your needs
 - Procurement of the LiDAR contractor according to state and federal regulations
 - Contract price negotiation on behalf of their client

Benefits of a Partnership

- Cost sharing
 - USGS - \$75,000
 - City of Springfield - \$47,250
 - Greene County - \$160,000
 - City Utilities - \$25,000
- Economy of Scale
- Data Continuity
- Expert Advice & Procurement – Very Important!



Pitfalls of a Partnership

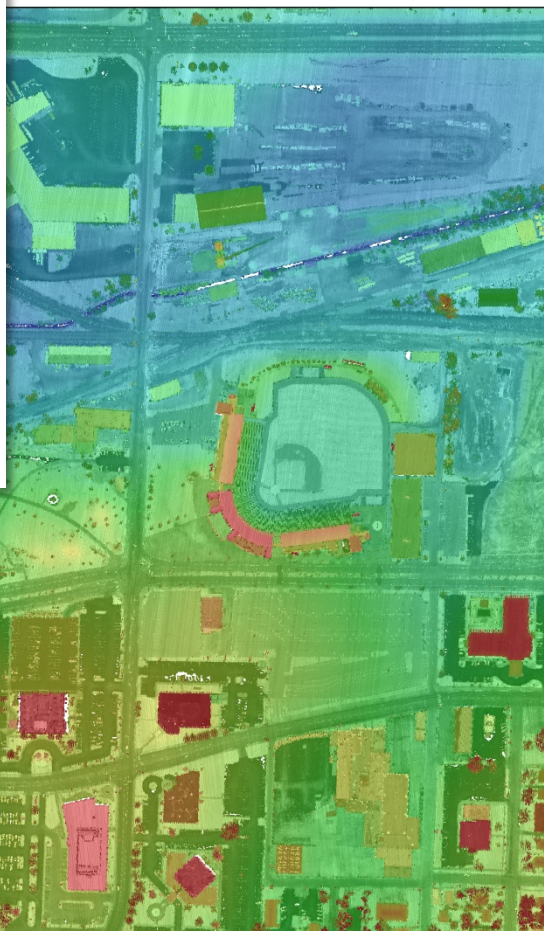
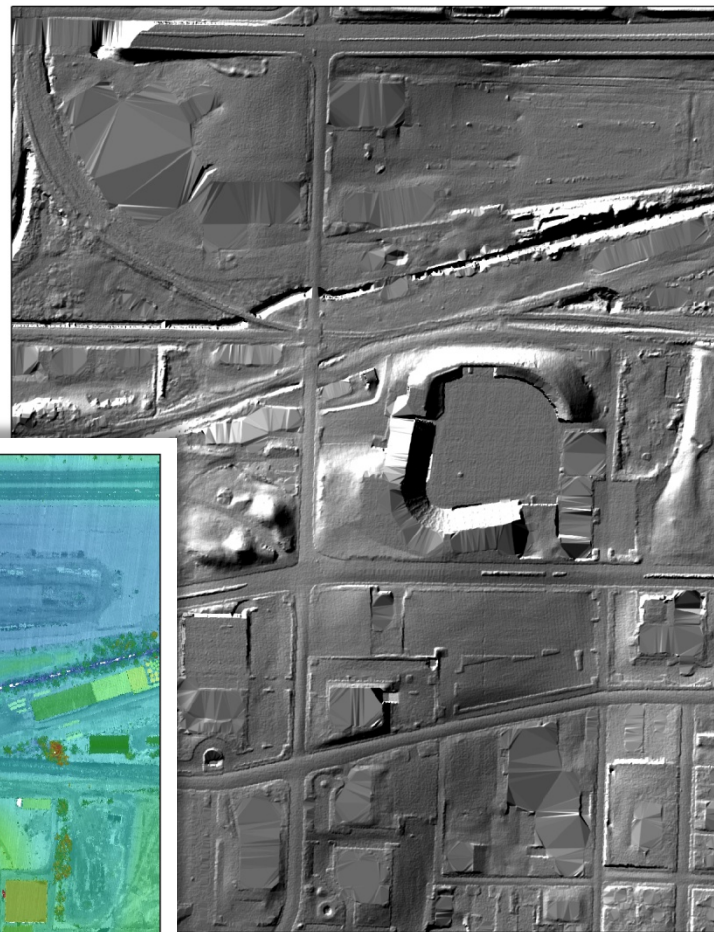
- Too many cooks in the kitchen!
- Communication: It's hard to keep everyone on the same page at all times
- Multiple and conflicting deadlines



END RESULT

LIDAR DATA: 2011





High Density LiDAR

- High Density LiDAR is a project-specific, high accuracy and point concentrated data set.

Typical uses for the dataset include:

- Heavily vegetated project areas
- Land development, transportation and other corridor projects
- County mapping projects requiring sub-meter point postings
- Terrain, forestry, and volumetric analysis
- Change detection and 3-D modeling in dense urban areas

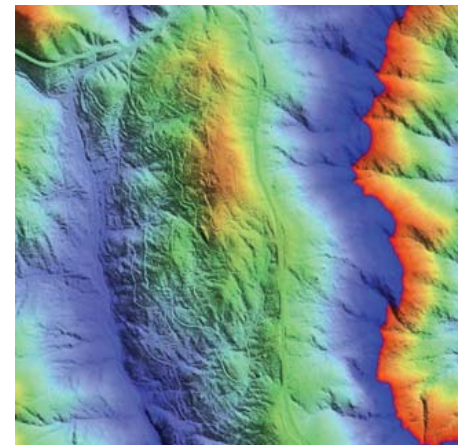
Accuracy Requirements

- Vertical Bare Earth – 15cm (5.9in)
- Vertical in Vegetation – 27cm (10.6in)
- Ground Sampling Every 0.7m

*Using High Density LiDAR should increase accuracy above minimum requirements

Project Deliverables

- LiDAR Bare Earth DTM (.las file)
- LiDAR data points classified as Bare Earth, Vegetation, or Buildings
- ESRI Floating Point Grid
- Bare Earth DTM
- ASCII Files (classified and unclassified)



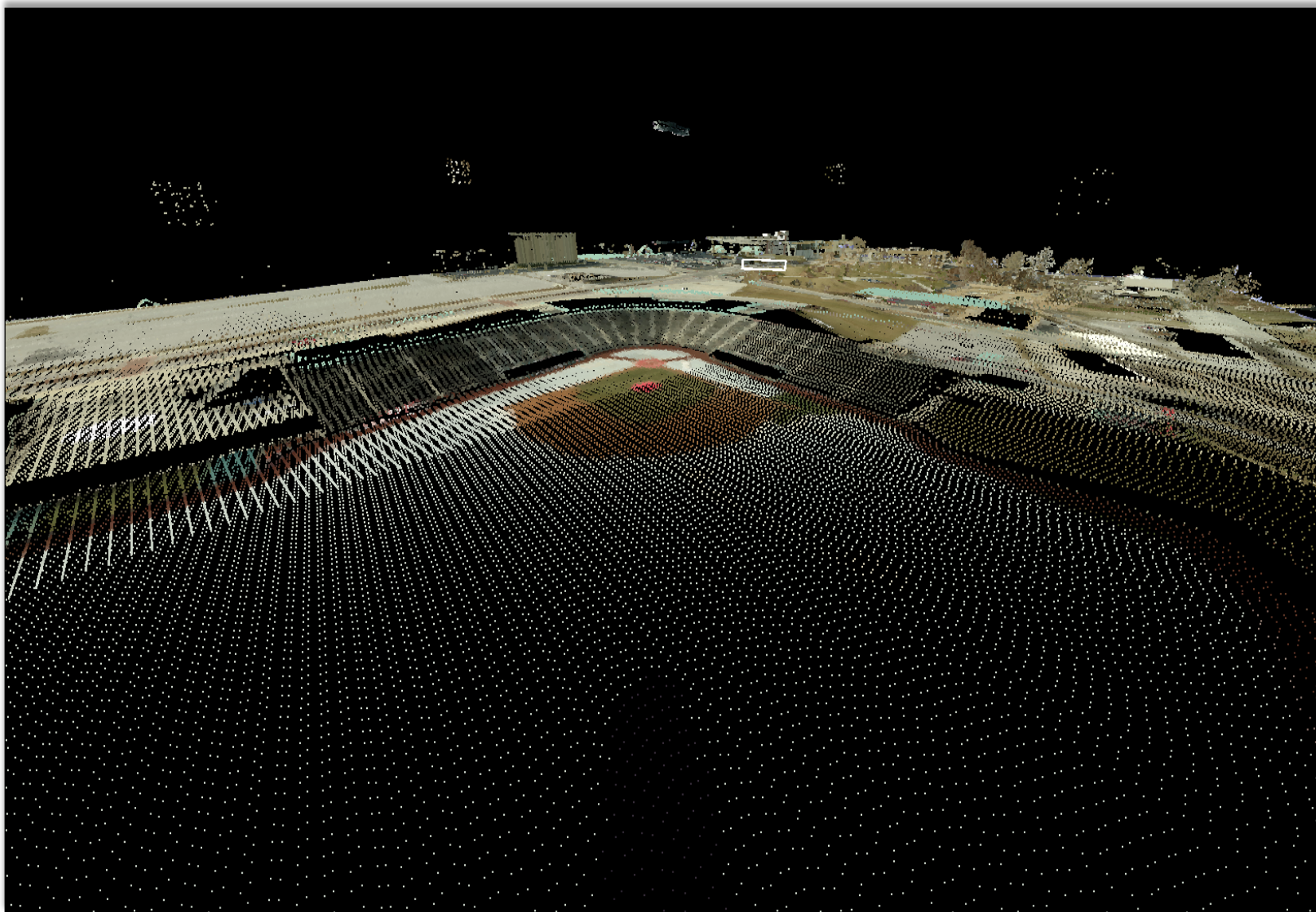
Products Produced

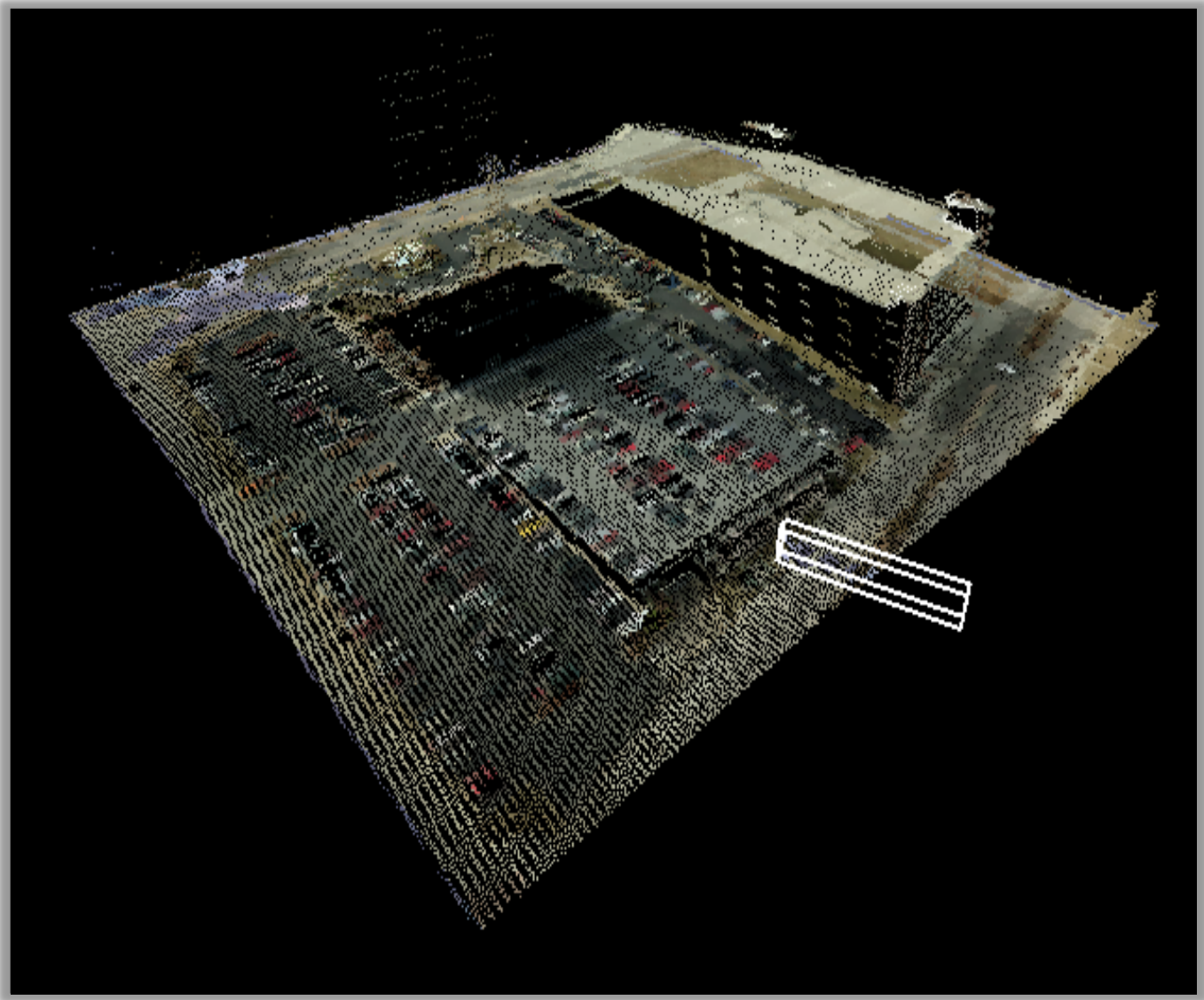
- Digital Contours – 1ft, 2ft, 5ft, 10ft & 50ft
- Hillshade DEM – For display

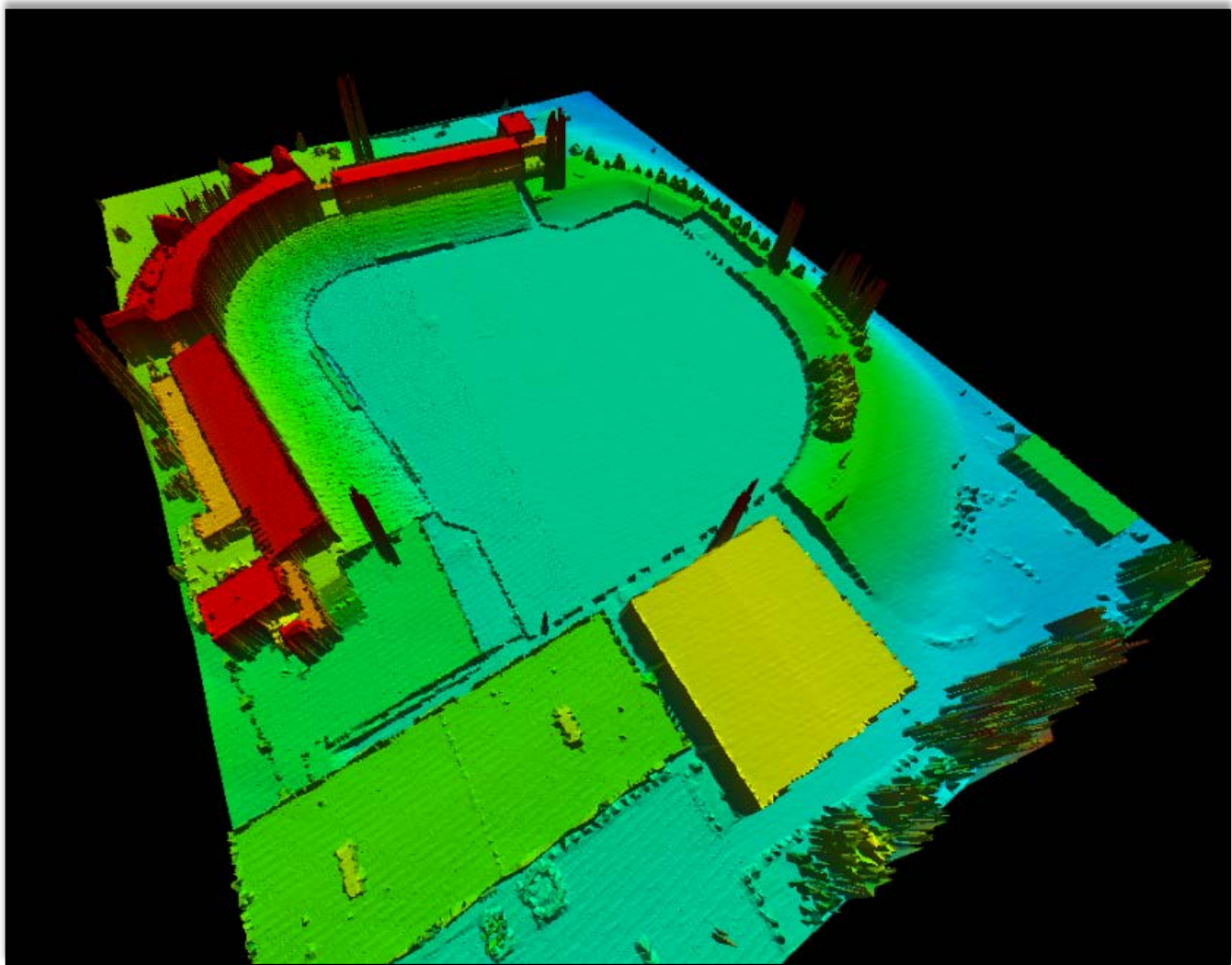


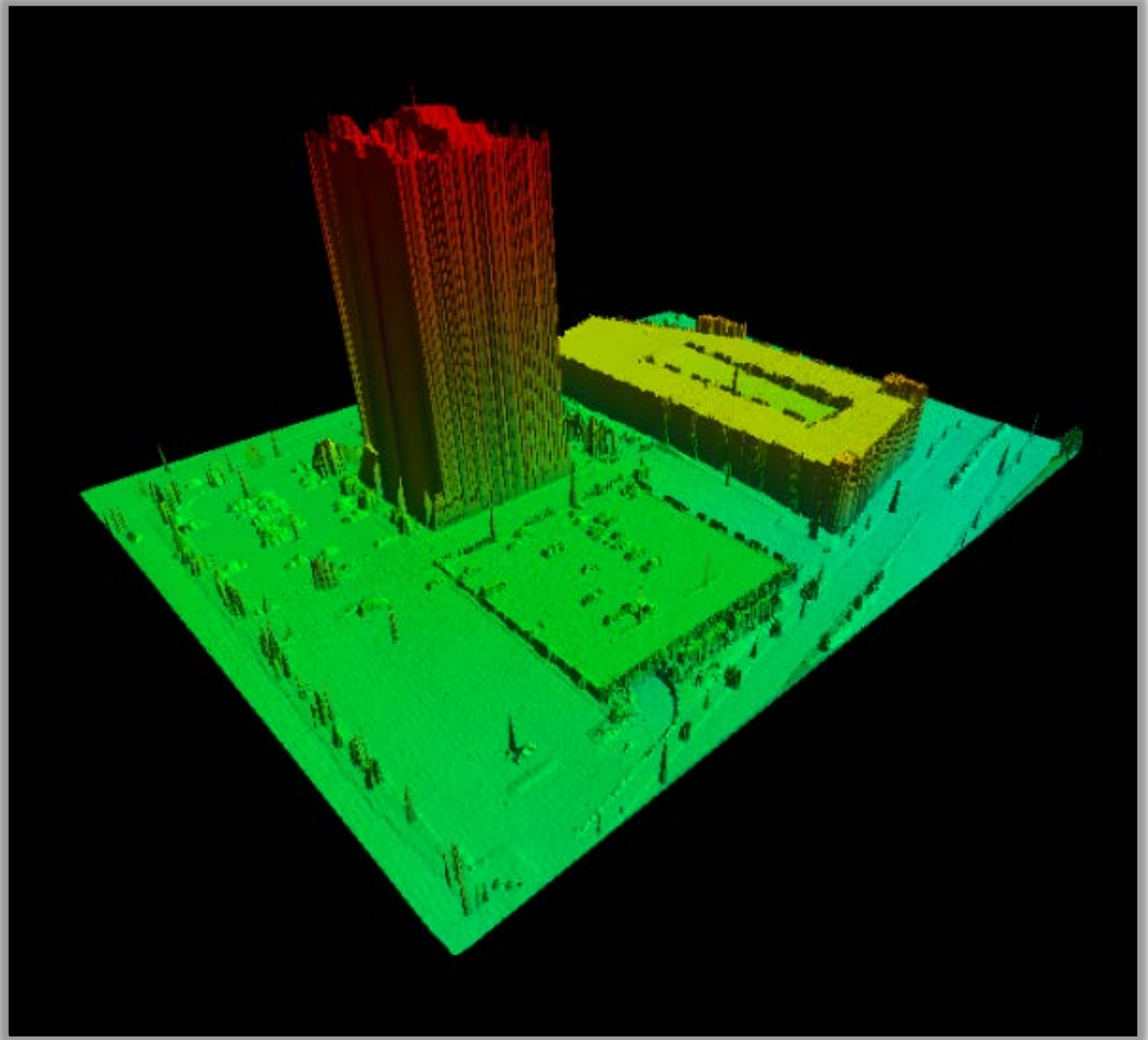
LiDAR Uses

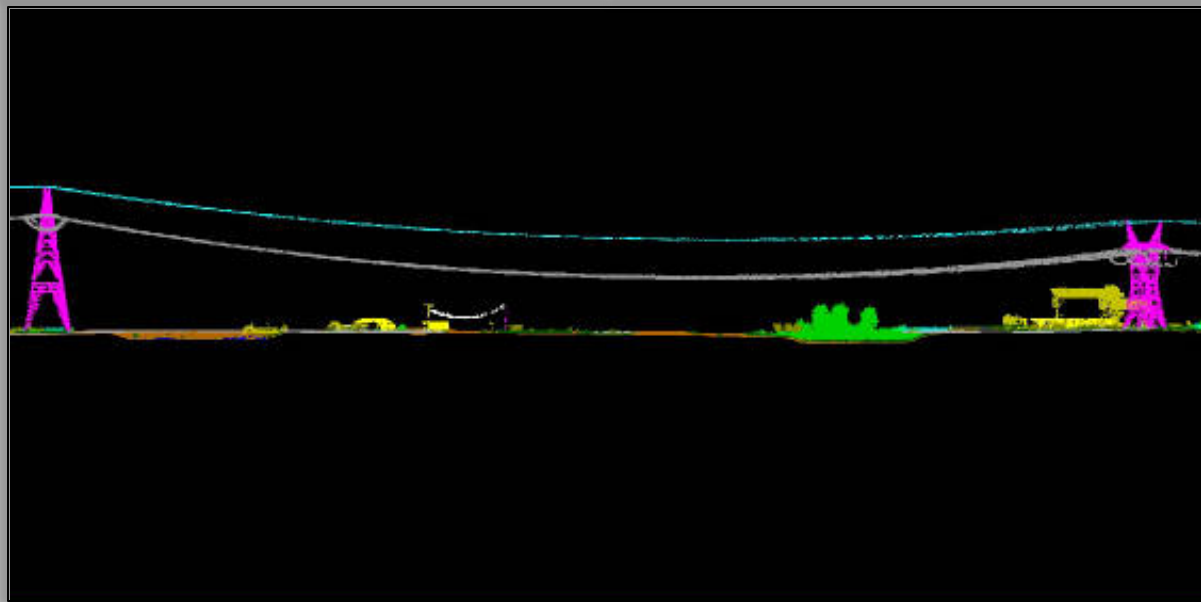
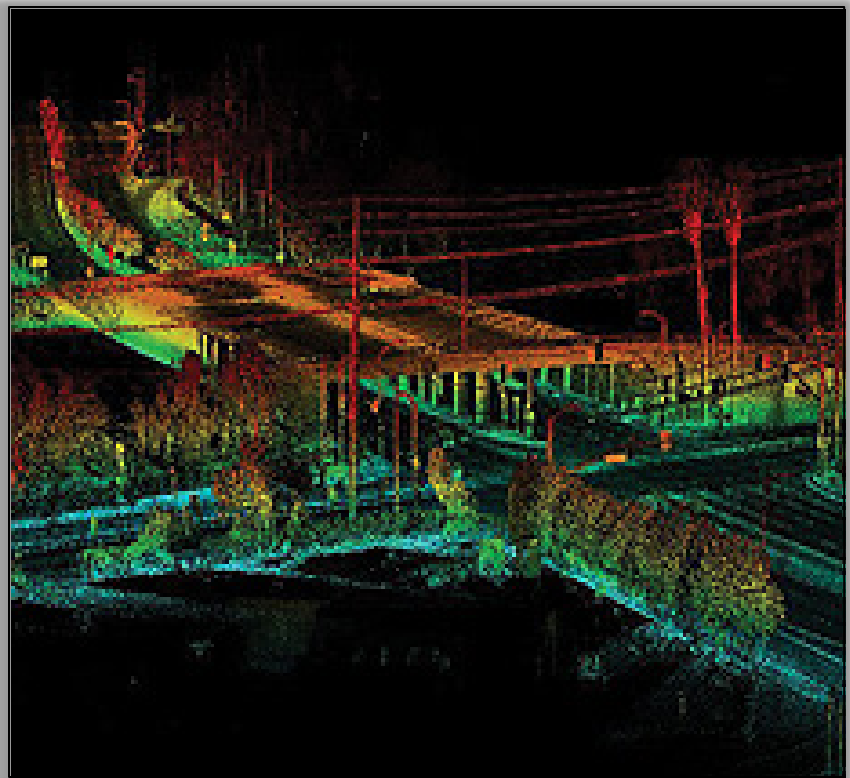
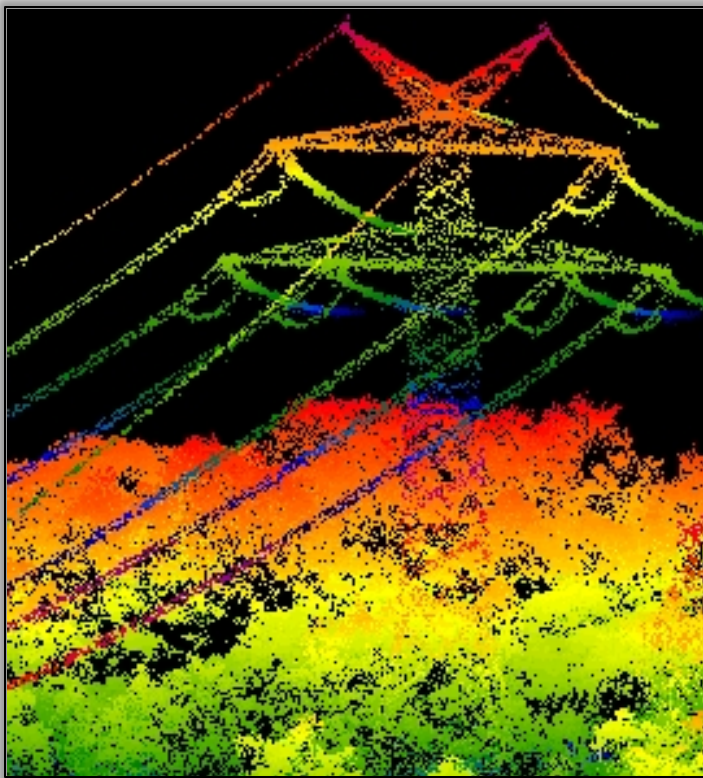
- Updated contours 1ft, 2ft, 5ft, & 10ft (replaces 12 year-old data)
- Accurate ground surface can replace some preliminary survey
- Assess building, tree, and other object heights
- Elevation of stormwater & sanitary sewer manholes
- Revised flood studies (data exceeds FEMA standards)
- Establish BFEs in unstudied floodplains (LOMA)
- Check detention basin volumes
- Identify and analyze sinkholes
- Impervious surface analysis
- Enhanced hydrology
- Tree canopy, density, riparian corridor
- Orthorectify aerial photography (gives accurate distances between points)
- Better GIS exhibits











Project Costs

LiDAR Collection	\$270,000
Floating Grid	\$ 10,000
USACE Fee	\$ 26,000
<u>USGS Contribution</u>	<u>\$ (75,000)</u>
Total Cost to Locals	\$231,000

Cost Comparison

- 1999 2-ft Digital Contours
 - Included aerial imagery
 - \$3,500/sq mi
- 2011 LiDAR Data
 - \$340/sq mi

Distribution

- MSDIS (Missouri Spatial Data Information Service)
- It's FREE
- Reduces staff time needed for data requests

Outreach

- For local users, the data will be made available from any City GIS console.
- Presentations to user groups
- City is working on a training video for CAD users

Any Questions:



- Partner Contacts
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