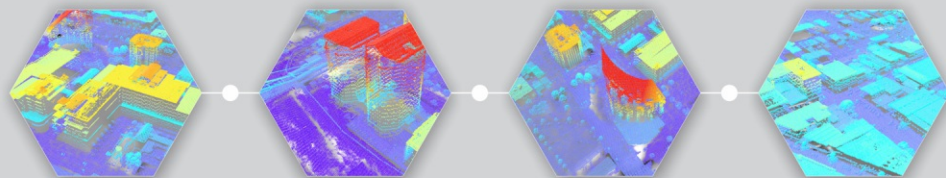


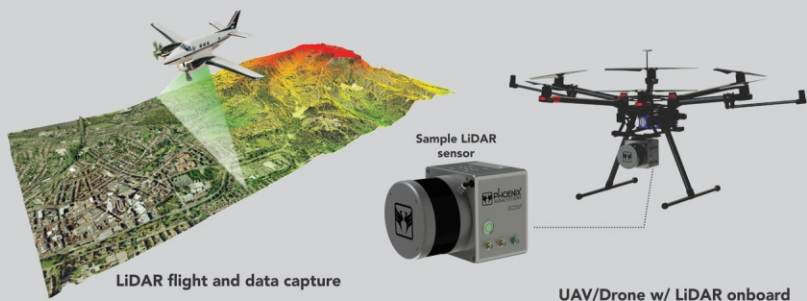
LiDAR

Light Detection and Ranging



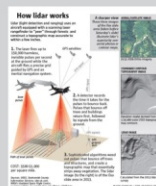
What is LiDAR?

- LiDAR stands for "Light Detection and Ranging", similar to RADAR but with light instead of sound waves.
- A remote sensing method that uses pulsed light to measure distances.
- The light pulses - combined with GPS - generate precise, three-dimensional information about the shape of the Earth and its surface characteristics.
- A LiDAR instrument consists principally of a laser, a scanner, and a specialized GPS receiver.
- Airplanes, helicopters, and UAVs (drones) are the most commonly used platforms for acquiring LiDAR data over large areas.
- Two types of LiDAR are topographic (uses near-infrared laser light) and bathymetric (uses water-penetrating green light to measure seafloor and riverbed elevations).

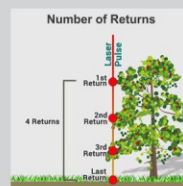


LiDAR Point Classification

- Light pulses emitted from a LiDAR system reflect from objects below: trees, buildings, bridges, and pavement.
- One emitted light pulse can return to the LiDAR sensor as one or many returns. Any emitted light pulse that encounters multiple reflection surfaces as it travels toward the ground is split into the same number of returns.
- In the case of multiple returns, the intermediate returns are used generally for vegetation structure and the last return for bare-earth terrain models; however, the last return will not always be a ground return.



LiDAR flight and data capture



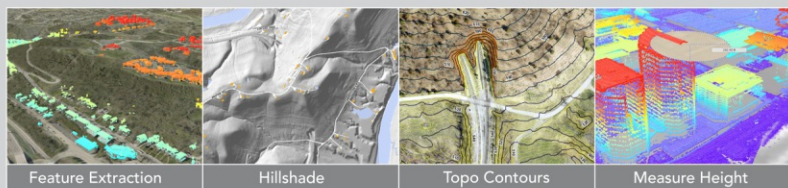
LiDAR returns

LiDAR stored in LAS format has a standard classification scheme

Classification Value - Meaning		
0 - Never classified	7 - Low Point	14 - Wire - Conductor (Phase)
1 - Unassigned	8 - Reserved *	15 - Transmission Tower
2 - Ground	9 - Water	16 - Wire-Structure Connector (Insulator)
3 - Low Vegetation	10 - Rail	17 - Bridge Deck
4 - Medium Vegetation	11 - Road Surface	18 - High Noise
5 - High Vegetation	12 - Reserved *	19-63 - Reserved
6 - Building	13 - Wire - Guard (Shield)	64-255 - User Definable

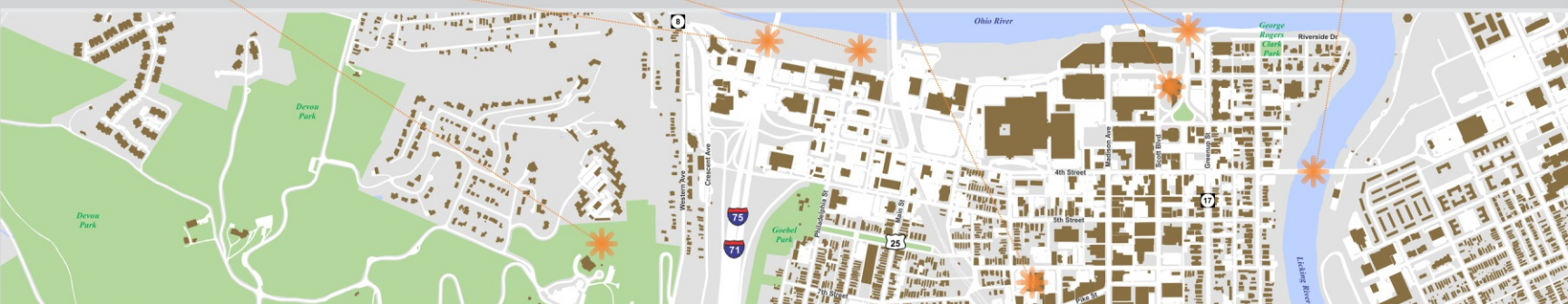
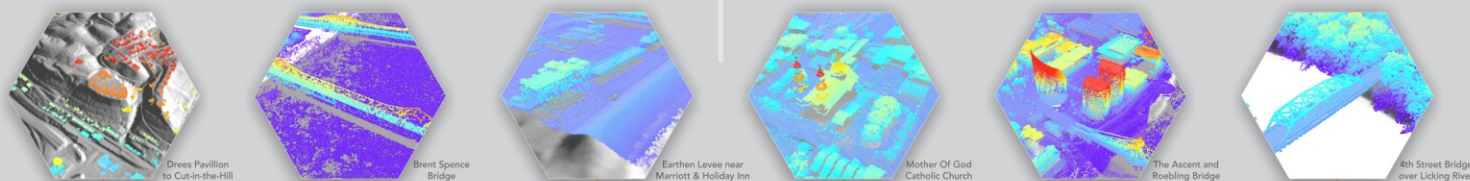
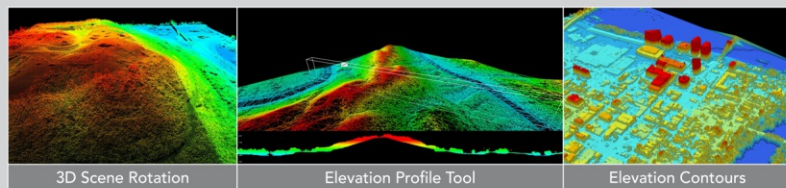
LiDAR Applications

- Topographic Lines - 2-foot and 10-foot contour line intervals showing elevation
- DEM - digital elevation model is countywide data where each 5-foot x 5-foot square is assigned an elevation height
- Hillshade - 3D representation of the ground, with the sun's position taken into account
- Feature Extraction - identification of objects in the built environment (buildings, towers, pavement, etc.)
- Heights - measurement of feature heights (tree canopy, buildings, multi-planed roof surfaces)



LiDAR Data in Kenton County

- Countywide data available for 2007 and 2012
- Over 75 GB LiDAR data (LAS format)
- 1.7 billion points in the 2012 LiDAR dataset
- Each point represents an X,Y,Z location - latitude, longitude, and elevation



NKYmapLAB

February 2017 Volume 3: Map 1

Northern Kentucky mapLAB is a regionalized, collaborative project of Planning and Development Services of Kenton County, KY, and the City of Cincinnati, OH. The project is a joint effort to create a comprehensive map of the region, including the Ohio River, and to provide a platform for the public to share their ideas and feedback. The project is a joint effort to create a comprehensive map of the region, including the Ohio River, and to provide a platform for the public to share their ideas and feedback.

LiDAR Elevation Profiles

- Point of LiDAR profile
- Park
- Building
- Pavement

Featured Data Sources

www.direction2030.org
www.linkgis.org
www.pdsc.org
www.arcgis.com

PDS

NKYmapLAB Awards

2015 KY GIS Award
2015 KY GIS Award
2015 KY GIS Award
2015 KY GIS Award

LiDAR

LiDAR is a remote sensing technology that uses light in the form of a pulsed beam to measure distances. The light is emitted from a sensor, reflects off a surface, and returns to the sensor. The time it takes for the light to return is used to calculate the distance to the surface. LiDAR is used in a variety of applications, including mapping, surveying, and environmental monitoring.

LiDAR Kenton County

LiDAR is a remote sensing technology that uses light in the form of a pulsed beam to measure distances. The light is emitted from a sensor, reflects off a surface, and returns to the sensor. The time it takes for the light to return is used to calculate the distance to the surface. LiDAR is used in a variety of applications, including mapping, surveying, and environmental monitoring.

direction 2030

Your Voice. Your Choice.

Goals and Objectives

- C Community Identity
- E Economy
- G Governance
- H Health
- HC Healthy Communities
- M Mobility
- N Natural Systems
- Primary Goal
- Secondary Goal

How Does This Topic Apply to Direction 2030?

- N** Strive to achieve a balance between development and preservation.
- HC** Encourage innovative design on sites with constraints based on the presence of natural systems and incentivize the protection of quality open space.
- G** Encourage cooperative governance.
- E** Continue to encourage the sharing of technical tools and resources effectively reducing the cost of the system.