ELECTRICAL INFRASTRUCTURE MAPPING AT PURDUE

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PROJECT TEAM MEMBERS

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ABOUT
• Over 380 buildings
• Approximately 18M GSF
• 2,600+ acres
• Over 200 miles of underground utilities

SERVICES
• Physical Facilities
  – Buildings and Grounds
    • Operations and Maintenance
  – Energy and Construction
    • Energy and Utilities
  – Asset Management
    • Campus Planning
    • Office of University Sustainability

• External Units
  – Environmental Health and Public Safety
    • Police
    • Fire
    • Radiological and Environmental Management
  – Service Enterprises
    • Parking, Airport and Transportation
    • Materials Management and Distribution
RECENT/CURRENT

- Annexation by the city of West Lafayette
- Thomas S. and Harvey D. Wilmeth Active Learning Center
- Honors College and Residences

UPCOMING

- Purdue Research Park Aerospace District
- Flex Lab Facility
- Bechtel Innovation Design Center
- Zucrow Lab expansion
- State Street Redevelopment Project
- Football Training Facility
- Hobart and Russell Creighton Hall of Animal Sciences and Land O’ Lakes Center for Experiential Learning
- Agronomy Center Automated Phenotyping and Seed Processing Laboratory
The University has experienced significant changes on and around campus over the last several years. Documenting changes to the campus environment is necessary for the safety of students, faculty, and staff, as well as planning for construction projects and providing campus services.

- Documentation supporting electrical distribution assets was outdated or non-existent
- Methods for obtaining information about the campus electrical infrastructure were inefficient and paper-based

**INFORMATION SEEKING METHODS**

- Research hardcopy maps across different locations
- Evaluate accuracy and frequency of changes
- Seek out individuals who may have associated institutional knowledge
- Contact Indiana 811 and/or the University’s locate crew
ELECTRICAL DISTRIBUTION

THE SOLUTION

Use ESRI’s ArcMap solution within Physical Facilities GIS to develop an inventory and map for identified campus electrical distribution assets.

This would represent the first utility discipline mapped within a true GIS. Previous utilities had been mapped in a CAD-based environment which has advantages and limitations.

**CAD**
- Graphics are representative, not driven by data
- New information requires a completely new map each time
- Only outputs available are those that are inputs or representations
- Features must be re-symbolized manually to represent changes

**GIS**
- Graphics driven by data through a Geodatabase
- New information can be added to the same map or linked to other datasets
- Greater amount of attribute data about an object can be maintained
- Scalable
- Searchable
- Data representation allows for situational illustration
OBJECTIVE

• Update, inventory and map electrical distribution assets in and around the West Lafayette campus
• Make the product available for staff to use for asset management and planning needs

PURPOSE

• Campus safety
• Inventory and location of assets for biannual infrastructure inventory report to State
• Support development and maintenance of physical campus
• Knowledge base
CONSIDERATIONS

• Age of data and frequency of updates
• No single source of data and communication; multiple maps and sources
• Categorization of features had to balance both inventory and client needs
• Data collection process was needed
• Field verification to identify/validate gaps
Care was taken to identify important details, such as

- Object number
- Location
- Spare(s)
- Manhole size
- Orientation
- Access
- Manhole number
Feature Creation involved:
• Importing graphic data from CAD-based maps and files
• Identification of feature categories
• Definition of collection requirements
• Definition of symbolization

Feature example: manhole lids

Abandoned
Annotation
Boulevard Lighting
Boulevard Supporting
Duct banks
Lighting
Hand Holes
Manhole Lids
Manholes
Power Poles
Primary
Switches
Transformers
Vault

Over 12,000 features documented
• Staff are able to use the application in project planning
• Source data is attached for ready reference
• The ability to trace distribution throughout multiple sites is more efficient
ELECTRICAL DISTRIBUTION

NEXT STEPS

- Establish plan and process to maintain data currency
- Collaborate with Utilities Distribution staff on further data collection
- Align symbology with industry norms
- Partner with Utilities stakeholders to transition other utilities
THANK YOU