Pennsylvania’s Cultural Resources GIS:
The Proverbial Eight-Year Old and the Hammer – Finding the Next Problem to Solve

Presented by Ira Beckerman and Noël Strattan
TRB 2009

A cooperative venture of the Pennsylvania Historical & Museum Commission and the Pennsylvania Department of Transportation
Meeting a Need

• Agencies must consider project impacts on historic resources
  – What historic resources are already known?
  – What surveys have already been done?
  – How to interpret what is found?

• The SHPO has data on historic resources
  – How can we share the data to help agencies?
A Challenge: Security

• Sensitive data
  – Archaeological site locations
  – Landowner information
  – Sacred places

• Who should have access to what?
Our Solution

- Web accessible GIS with map and database search capabilities
  - Password protected
  - Authorized user requirements
  - Registration of authorized users
  - Tracking of use to machine address
  - SSL, Authentix, and object level security
3 Levels of Access

**Public** – anyone interested in history or archaeology

**Planner** – professional who develops or reviews project plans that have the potential to affect cultural resources

**Archaeologist** – any one who meets the Secretary of the Interior’s Standards as an archaeological professional
Public:

open to every one with general password

– Can search and view data for all resources through Ask ReGIS
– Can map historic sites and archaeological surveys
– Spatial search gives only summary archaeological information
Planner:
open to planning professionals by application for individual password

– Can search and view data for all resources through Ask ReGIS
– Can map historic sites and archaeological surveys
– **Spatial search gives specific site information inside search area, but does not map archaeological sites**
Archaeologist:
open to archaeological professionals by application for individual password

- Can search and view data for all resources through Ask ReGIS
- **Can map archaeological sites** and surveys and historic sites
- Spatial search gives specific archaeological site information
Archaeologist: open to archaeological professionals by application for individual password

- Can search and view data for all resources through Ask ReGIS
- **Can map archaeological sites** and surveys and historic sites
- Spatial search gives specific archaeological site information
Functionality: What’s in my project area?

(Archaeologist’s view)
Functionality: What’s in my project area?

(Public and Planner View)
**Functionality:** What’s in my project area?

### Spatial Summary (Archaeologist or Planner)
- **Historic Sites:** 0 Records
- **Unmapped Historic Sites:** 3 Records
- **Archaeological Sites:** 1 Record
- **Archaeological Sites by Watershed:** 1 Record
- **Archaeological Survey Reports:** 0 Records

### Spatial Summary (Public)
- **Historic Sites:** 0 Records
- **Unmapped Historic Sites:** 3 Records
- **Archaeological Sites by Watershed:** 1 Record
- **Archaeological Survey Reports:** 0 Records
Functionality: What’s in my project area?

CRGIS Spatial Summary (Public)

+ Historic Sites (0 Records)
- Unmapped Historic Sites (3 Records) Click to view records.

<table>
<thead>
<tr>
<th>Key #</th>
<th>ID</th>
<th>Address</th>
<th>Municipality</th>
<th>County</th>
<th>Historic Name</th>
<th>National Register Status</th>
<th>Tax Parcel</th>
<th>Resource Category</th>
<th>Date Built</th>
<th>Material</th>
<th>Bridge</th>
</tr>
</thead>
<tbody>
<tr>
<td>031988</td>
<td>31896</td>
<td>15 N Lancaster St.</td>
<td>Jonestown Borough</td>
<td>Lebanon</td>
<td>Leffler, W.</td>
<td>Undetermined</td>
<td></td>
<td></td>
<td>1800</td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>031956</td>
<td>31863</td>
<td>14 S Market St.</td>
<td>Jonestown Borough</td>
<td>Lebanon</td>
<td>Phillips &amp; Kleinfelter</td>
<td>Undetermined</td>
<td></td>
<td></td>
<td>1800</td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>135429</td>
<td>122166</td>
<td>SR 1003</td>
<td>Jonestown Borough</td>
<td>Lebanon</td>
<td>Ineligible</td>
<td>Structure</td>
<td></td>
<td>Steel</td>
<td>1950</td>
<td></td>
<td>Y</td>
</tr>
</tbody>
</table>

- Archaeological Sites by Watershed (1 Records) Click to view records.

<table>
<thead>
<tr>
<th>All Prehistoric Sites</th>
<th>Datable Prehistoric Sites</th>
<th>Datable Upland Prehistoric Sites</th>
<th>Prehistoric Sites with Features</th>
<th>Datable Stratified Prehistoric Sites</th>
<th>Historic Archaeological Sites</th>
<th>Sites w/ Identified Lithic Material</th>
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<tr>
<td>(7) Lower Susquehanna River D</td>
<td>469</td>
<td>226</td>
<td>107</td>
<td>5</td>
<td>13</td>
<td>90</td>
<td>275</td>
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### Functionality: What’s in my project area?

#### Historic Sites (0 Records)
- **031988**
  - Inventory: 31896
  - Address: 15 N Lancaster St.
  - Municipality: Jonestown Borough
  - County: Lebanon
  - Historic Name: Leffler, W.
  - National Register Status: Undetermined
  - Tax Parcel: 1800
  - Resource Category: Bridge
- **031965**
  - Address: 14 S Market St.
  - Municipality: Jonestown Borough
  - County: Lebanon
  - Historic Name: Phillips & Kleinfeiler
  - National Register Status: Undetermined
  - Tax Parcel: 1800
  - Resource Category: Bridge
- **135429**
  - Address: SR 1003
  - Municipality: Jonestown Borough
  - County: Lebanon
  - Historic Name: Ineligible
  - National Register Status: Structure
  - Tax Parcel: Steel
  - Date Built: 1960
  - Bridge: Y

#### Unmapped Historic Sites (3 Records)
- Click to view records.

#### Archaeological Sites (1 Records)
- Click to view records.

The following sites are located in the selected area and may be affected by your project. For more information, contact your Cultural Resource Specialist or the Bureau for Historic Preservation.

- **Site #**: 36LEB153
- **Site Name**: Informant Interview/Amateur Survey
- **Site Type**: Prehistoric
- **Topographic Setting**: Terrace
- **Stratified Soils**: No
- **Bedrock Formation**: Oh-Ordovician, Hamburg, Sequence-phylilitic shale
- **IR Status**: Insufficient Data Available to Make a Decision
- **Meters To Water**: 10

#### Archaeological Sites by Watershed (1 Records)
- Click to view records.

<table>
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Functionality: Where is this historic resource?

OR

Search by Resource
Functionality: Where is this historic resource?
Functionality: Where is this historic resource?
Functionality: Where is this historic resource?

Search by Resource
Functionality: Where is this historic resource?
Functionality: What is this historic resource?
Functionality: What is this historic resource?
Functionality: What is this historic resource?
Functionality: What other resources are like this one?

Search by Resource Type
Functionality: What other resources are like this one?
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Search by Resource Type
Functionality: What other resources are like this one?

Search by Resource Type
Functionality: Who has worked in this area?

Search by Resource
Functionality: Who has worked in this area?
ABSTRACT

A Phase I archaeological survey was conducted for the area to be affected by the planned construction of sewage collection lines and treatment facilities in East St. Clair, West St. Clair, and King townships, and the boroughs of Pleasantville and St. Clairsville, Bedford County, Pennsylvania. The Chestnut Ridge Joint Municipal Authority system includes a treatment plant site and approximately 32 mi (51 km) of sewer lines. The Phase I survey examined the portions of the collection system that lie outside disturbed areas such as railroad beds, paved roads, and basins. The study area was defined during a preliminary reconnaissance to include approximately 33,000 linear ft (9750 m) or 6 mi (10 km) of proposed sewer lines. The 14-acre treatment plant location lies in an area excluded from further field testing after a preliminary study by the Baltimore District Corps of Engineers. Assuming a 50 ft (15 m) wide right-of-way for the alignments, a total of approximately 37 acres (15 ha) was surveyed. Of this area, only ca. 25% (9 acres) were considered to have a high potential for prehistoric sites. None of the study area had any substantial potential for important historic deposits. The study area is situated along Dravus and Bells creeks, tributaries of the Raystown Branch of the Juniata River. Much of the study area consists of the stream terraces of the two streams, or adjoining uplands.

The Phase I survey included a preliminary reconnaissance to identify areas of archaeological potential and the excavation of subsurface test units at various intervals, depending on the archaeological potential of particular settings. Settings within the study area were characterized as having low to high potential for the presence of prehistoric archaeological sites on the basis of several factors: proximity to known sites and historic Indian trails, slope, soil characteristics (especially drainage), and proximity to water sources. A total of 327 shovel tests and two one-meter test units were excavated and a number of plowed fields with adequate surface visibility were systematically inspected, resulting in the discovery of eleven prehistoric sites. These sites represent a range of functional types, from small, ephemeral campgrounds or browse sites to larger, seasonal base camps. No potentially significant historic archaeological sites were found.

In summary, eleven prehistoric archaeological sites were discovered within the project area, seven of which were judged potentially significant. In these seven cases, the proposed alignments either affect the sites only marginally, or alternative alignments were considered which will avoid impacts to the site. Assuming that these avoidance alternatives are chosen, the project should have no effect on cultural resources.
Visitation

- Average monthly website use FFY 2008
  - Visits 2820
    - Average duration 15:22 minutes
  - Unique Visitors 1014
  - Repeat Visitors 305
    - Ranging from 2 – 95 visits/person
Current status of data

- Historic Resources (HRF)
  @128,000 resource records (keyno)
- Archaeological Sites (PASS)
  @21,000 sites
- Archaeological Survey Reports
  @ 6,000 reports
How do we share data now?

– HRF
  • **Website** – *limited tabular data downloads possible, but not spatial*
    – Publicly accessible
  • **Data Requests** – Tabular and spatial
    – limited term use
    – large projects,
    – context studies,
    – area surveys
    – use agreement required
How do we share data now?

- Archaeology
  - *Website – limited tabular data downloads possible, but not spatial*
    - passwords
    - levels of access
  - Data Requests — Tabular and spatial
    - limited term use
    - large projects,
    - predictive models and
    - Phase III contexts
    - use agreement required
IT'S INTERMISSION TIME, Folks!
Recent changes to transportation

• SAFETEA-LU, especially Sections 6001 and 6002 – *August 10, 2005*

• 23 CFR 450 Final Rule, especially Appendix A – *March 16, 2007*
Section 6001 Highlights

- Include mitigation opportunities in plans
- Make sure plans promote environmental protection and encourage consistency between projects and planned growth
- Talk to people* about conservation plans and environmental inventories
- Figure out how to involve the public in TIP development – participation plans

*people means resource agencies, other stakeholders, and the public
Section 6002 Highlights

- Defines Environmental Review Process
- Participating agencies invited
- Review Timeframes
- Early involvement of agencies and public
- Statute of limitations as well as funding to agencies for a better process
The Long-Range Transportation Plan

• May include some combination of policies, operations strategies, and projects
• Must covers at least the next 20 years
• Must lead to an intermodal system
• Must involve the public
• Must be fiscally constrained
• Must be updated every 3-5 years
Pennsylvania Planning

State level

LRTP → STIP

Metropolitan level

LRTP → TIP

Project Selection and Implementation

Project Selection and Implementation
23 CFR 450 Highlights
Statewide and Metropolitan Transportation Planning

• Appendix A Guidance: Linking Planning and NEPA

• “statewide and metropolitan transportation planning should be the foundation for highway and transit project decisions”
• **LPN** (or PEL- Planning and Environmental Linkages) implements aspects of SAFETEA-LU as well as TEA-21

• Definitions for: Consultation, Coordination, Consideration, and Cooperation

• Promotes analytic tools, such as GIS, environmental scans, projections, plans
LPN Goals

• Better information sharing
• Better communication amongst agencies
• Better guidance
Transportation

Resource Agency

System-level Planning

Project-level Decision

Integrated Planning, Consultation

Linking Planning and NEPA

23 CFR 450/ Appendix A

NEPA, Environmental Review Process

S-LU 6001

S-LU 6002

Slide Courtesy of Shari Schaftlein, FHWA Project Development & Environmental Review
Linking Planning and NEPA: Connecting SAFETEA-LU Sections

**Section 6001**
- Coordination with land and resource agencies, others
- Consideration of land use, resource concerns in the planning process

**Linking Planning and NEPA**
- Mechanisms and tools for coordination
- Planning products for use in NEPA

**Section 6002**
- Early coordination with resource agencies, other stakeholders for process improvement and higher predictability

*Slide courtesy of Michael Culp and John Humeston, FHWA Office of Environment and Planning, 2006*
CRGIS and LPN Goals

- Better information sharing
- Better communication amongst agencies
- Better guidance
Better information sharing:

- Shared GIS gives same data to everyone *(all the time, in real time)*
- GIS facilitates layering & analysis
- CRGIS readily shows data gaps and holes
CRGIS and LPN Goals

- Better information sharing
- Better communication amongst agencies
- Better guidance
CRGIS and LPN Goals

- Better Communication
- Need for the same data makes people talk to each other
- Same data supports replicability in results
- Data underlying decisions easily verified — builds trust
CRGIS and LPN Goals

• Better information sharing
• Better communication amongst agencies
• Better guidance
CRGIS and LPN Goals

Better guidance

• GIS forces standardization in data
• GIS forces standardization in approach
• GIS forces explicit definitions
CRGIS and LPN

• 3 Ways CRGIS helps LPN
  – Better programming for TIP
  – More intelligent advanced mitigation
  – Integrates Historic Resources in LRTP
CRGIS and LPN

Better programming for TIP

– Built environment up front and at fingertips for MPO/RPO

– Archaeological modeling can be extended into probability polygons – estimate entire space

– The larger the project/corridor, the more useful CRGIS
CRGIS and LPN

More intelligent advanced mitigation

– Offsite is now acceptable
– Look to optimize benefit
– Need regional approach

CRGIS has tools to analyze region and optimize solutions spatially, e.g. find me all historic schools in Indiana County ranked by number of children 5-12 years old less than 3 miles away
CRGIS and LPN

• Integrates Historic Resources into LRTP
CRGIS and LPN

- Northern Tier RPO
- Developing 30 year LRTP
- Region poorly inventoried for historic resources
- PHMC, DCED partnered to develop historic preservation plan
CRGIS and LPN

- Emphasis on inventorying corridors of regional **significance**
- **Significance** through tourism or higher traffic
- 15 Corridors surveyed
- Corridors are the source for most TIP projects
- Results being put into CRGIS to then service Northern Tier MPO
CRGIS and LPN

• “Wrong” uses of CRGIS
  – Reliance on data dumps
    • the second it is downloaded, it is out of date and no longer “data sharing”
    • Old data is hard to “kill”
  – Misreading negative information
  – Closed/turnkey systems – can’t serve data to the outside: agencies, public, etc.
Implications for CRGIS use

- For **full data** sharing, must be
  - Updated in real time
  - Instantly available
  - Serve across multiple platforms/users

- INTERNET is only suitable approach
CRGIS 2009 and Beyond

- Future upgrades to include:
  - Archaeological sensitivity layer (model)
  - Other historic resource layers, e.g. cemeteries

- More partnerships with MPO/RPO’s
  - Including data sharing agreements
• Closing thoughts:
  – Technology not really a problem anymore
  - Biggest issues around projections -
  – Funding to maintain data is critical but can be done!
  – **Biggest obstacle** is unwillingness to share data – *this is a trust issue not a technology issue!*
Thank you…

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http://crgis.state.pa.us

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