



PA-SHARE

Pennsylvania's Historic & Archaeological Resource Exchange



STATE: Commonwealth of Pennsylvania

AGENCY: Pennsylvania State Historic Preservation Office

AWARD CATEGORY: Data Management, Analytics & Visualization

PROJECT TITLE: PA-SHARE: Pennsylvania's Historic & Archaeological Resource Exchange

PROJECT START: June 2018

PROJECT END: Phase 1 - August 2021, Phase 2 – Ongoing

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Executive Summary

The Pennsylvania State Historic Preservation Office (PA SHPO) works to educate Pennsylvanians about the Commonwealth's vast collection of historic and archaeological resources, encourage them to value these resources as part of our collective past and future, and enable them to preserve the places that tell our local, state, and national stories for future generations. The PA SHPO's customers include municipal and city planners, other state agencies, archaeologists, historians, transportation construction project consultants, and the public.

The office had utilized a Cultural Resource Geographic Information System (CRGIS), a web-based application that could be used to search, view, analyze, and retrieve various cultural resource data within a GIS framework. However, by 2016 the technology could no longer fully meet the business needs of the PA SHPO with respect to the management of its program areas, nor the needs of its customers. Additionally, PA SHPO staff utilized several internal databases and information management systems to support daily operations that were not integrated with CRGIS.

Recognizing that the implementation of a new system could result in more efficient internal processes and procedures, improved coordination and communication with all external constituents, and increased access to data, PA SHPO developed a new enterprise-wide, spatially enabled cultural resource information system named the Pennsylvania State Historic and Archaeological Resource Exchange (PA-SHARE) to replace CRGIS and the other independent databases.

Launched in February 2021, PA-SHARE combines a GIS platform and custom-built project management software to make it easier and faster for users to find information about historic places and archaeological sites, process project submissions, and access state and federal historic preservation programs. PA-SHARE streamlines application and review processes with online forms, real-time updates, and project tracking. Interactive mapping allows users to pinpoint a specific place, define a project area, or draw boundaries. Six months later, the Surveyor Suite debuted on PA SHARE to enable users to conduct both above ground historic resource surveys and below ground archaeological surveys. PA-SHARE Surveyor is a set of desktop and mobile survey tools that add convenience, enable teamwork, and expedite resource information submission to PA SHPO. Integration with PA-SHARE means that the user's mobile data collection is always tied to a specific project and smoothly imported into the main inventory.

PA-SHARE has improved customer service, increased efficiency, and greatly reduced processing times both for customers and staff. For example, PA SHPO is required by law to complete an environmental review of a proposed transportation construction project within 30 days. The office now completes them in an average of 7 days instead of an average of 15 to 30 days, thanks to a new streamlined electronic workflow process. Consultants are now kept informed of their project's status at every stage from inception through closing. PA-SHARE has also improved cross agency collaboration through the integration of Pennsylvania's Department of Transportation (PennDOT) [Project PATH](#) system to promote better consultation between the PA SHPO, PennDOT, and the public on cultural resources that may be affected by transportation construction projects. Both agencies have benefited from productivity gains by spending less time processing projects and carrying out data entry.

Several SHPO's from other states have taken notice of the success of PA-SHARE and have contacted PA SHPO to ask questions or request demonstrations as they plan to build similar solutions of their own.

Idea

State Historic Preservation Offices (SHPOs) in all 50 states and many U.S. territories play a critical role in carrying out many responsibilities in historic preservation. The Pennsylvania SHPO (PA SHPO) is the official historic preservation agency for the Commonwealth of Pennsylvania. PA SHPO administers several federal programs created by the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470), in addition to many state programs authorized through the Pennsylvania History Code (Title 37). PA SHPO fulfills its mission through the following programs and services:

- Preparing and implementing a statewide historic preservation plan to guide historic preservation activities throughout Pennsylvania
- Providing information, education, training, and technical assistance to all Pennsylvanians about historic preservation and its many benefits
- Documenting historic properties and archaeological sites to help municipalities and agencies with decision-making
- Maintaining Pennsylvania's inventory of historic properties through an online GIS database
- Identifying and nominating properties to be listed in the National Register of Historic Places
- Supporting local governments in developing historic preservation programs, including the Certified Local Government (CLG) program
- Providing consultation and review of state and federal undertakings that may impact historic and archaeological resources. This includes projects, activities, or programs funded in whole or in part under the direct or indirect jurisdiction of a Federal or State agency, including those carried out by or on behalf of an agency; those carried out with public financial assistance; and those requiring a federal/state permit, license, or approval.
- Advising federal and state agencies and local communities in matters of historic preservation
- Working with property owners to take advantage of the federal Rehabilitation Investment Tax Credit (Historic Tax Credit) program
- Advising the Pennsylvania Department of Community & Economic Development on project eligibility for the State Historic Tax Credit program
- Administering the Keystone Historic Preservation Grant program
- Managing the Pennsylvania Historical Marker program
- Monitoring historic preservation covenants

Since its creation more than 50 years ago, PA SHPO has collected and created a large and varied number of records, only a fraction of which were available online. In 1997, the PA SHPO implemented the Cultural Resource Geographic Information System (CRGIS), which integrated a significant amount of digital data within a GIS framework and provided a centralized, web-based application that could be used to search, view, analyze, and retrieve various cultural resource data. For over two decades, CRGIS played a critical role in the daily operations of the PA SHPO. However, by 2016 the technology could no longer fully meet the business needs of the PA SHPO with respect to the management of its program areas, nor the needs of its external stakeholders. Additionally, PA SHPO staff utilized several internal databases and information management systems to support daily operations that were not integrated with CRGIS, including but not limited to: Environmental Review Tracking, National Register of Historic Places Log, Grants, Covenants, Historical Markers, and Tax Credit databases.

Recognizing that the implementation of a new system could result in more efficient internal processes and procedures, improved coordination and communication with all external constituents, and increased access to data, PA SHPO began planning to develop a new enterprise-wide, spatially enabled cultural resource information system named the Pennsylvania State Historic and Archaeological Resource Exchange (PA-SHARE) to replace

CRGIS and the other independent databases. The new system would efficiently integrate the vast amounts of data that existed in both hardcopy and digital formats and would support a revised business process for the effective management of the many PA SHPO programs.

IMPLEMENTATION

Business Needs Analysis

The PA SHPO conducted a thorough business needs analysis with assistance from an outside firm focused on assessing the current systems, data, resources, and workflows. The PA SHPO began to identify the requirements for a new system using re-engineered business processes to improve efficiency, increase the level and quality of service, and eliminate the limitations and issues of the legacy CRGIS system. This analysis was completed in June 2017.

Digitization Project

An in-house scanning project using a high-capacity scanner was initiated to digitize all the PA SHPO's paper resource files which includes reports, PA Archaeological Site Survey, and PA Above Ground Survey records. All paper records, except reports, were digitized by PA SHPO staff. A contract team of six cultural resource experts was hired to work on this project. This team's primary duties included data entry of files into CRGIS, scanning paper files, and uploading electronic records to CRGIS for eventual migration into PA-SHARE. The consultants also performed a gap analysis between paper and electronic records, tracked down and addressed discrepancies, and entered missing information. This work was completed in June 2020 at a cost of just under \$1 million.



It took three years to convert more than one million records in rows and rows of library files into digital documents which are now available online in PA-SHARE.

CRGIS Online Data Entry

To eliminate the need for duplicate manual entry of data into the system, a CRGIS data entry application update was released in August 2017 to allow external users to begin submitting their historical resource and report data electronically. PA SHPO began requiring use of online data entry for large projects in 2018.

PA-SHARE Surveyor Suite

In August 2021, PA SHPO introduced its newest set of tools, the [PA-SHARE Surveyor Suite](#), to enable users to conduct both above ground and archaeological surveys in Pennsylvania. PA-SHARE Surveyor is a new set of desktop and mobile survey tools that were designed to add convenience, enable teamwork, and expedite resource information submission to PA SHPO. Surveyor is integrated

with PA-SHARE, which means that the user's mobile data collection is always tied to a specific project and the resource data is smoothly imported into the main inventory. There are three tools in the Surveyor suite: Surveyor Manager, Surveyor Mobile, and the PA-SHARE Surveyor app.

- Surveyor Manager is a desktop user interface that is used in a web browser and is the means through which survey teams can review their field data and update, view, and interact with survey resource information prior to submission to the PA SHPO. The ability to pre-populate resource records in Surveyor Manager has two big benefits: field teams do not need to spend time on data entry in the field, and they will know

immediately which resources they need to survey. Both advantages translate into time – and money – saved.

- **Surveyor Mobile** is a map-centric webpage that can be used to communicate resource information to the Surveyor app for field data collection. Information gathered on mobile devices in the field about existing PA-SHARE resources can be sent directly to the PA-SHARE Surveyor app to update resource records. This means that users back at the office will not need to retype or recollect information on existing resources.
- **PA-SHARE Surveyor app** is a form-centric app that is used on a mobile device, such as a smartphone or tablet, to conduct field work on location and quickly collect information on above ground, archaeological, and district resources.



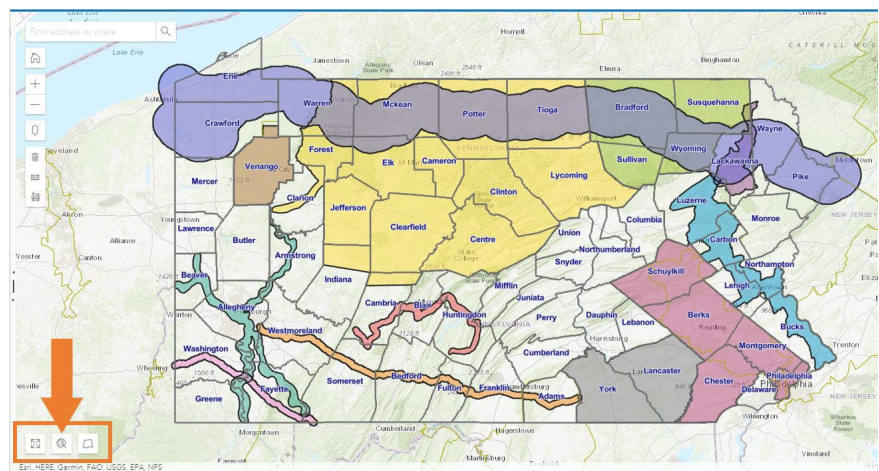
Customer Education Tools

PA SHPO also developed several new tools to assist users in learning about and using PA-SHARE.

- **PA-SHARE Webpages:** These pages are dedicated to educating both our internal staff and the public. They include instructions for registration and login, system troubleshooting, information about the different levels of PA-SHARE access and useful online tools, extensive FAQs, and help materials, including step-by-step tutorials and more.
- **PA-SHARE E-news:** PA SHPO developed an [e-newsletter](#) to help communicate important PA-SHARE information in the days leading up to and after the system launched. SHPO also maintains a [blog](#) which is frequently updated with information or new features recently added to PA-SHARE.
- **PA-SHARE YouTube Playlist:** There is a [dedicated playlist](#) in the PHMC YouTube Channel specific to PA-SHARE informational and training videos.

PA-SHARE

PA-SHARE leverages state-of-the-art enterprise technology that is based on the Esri ArcGIS platform. Esri client-side JavaScript API (JS API) is used for all map display and client-side geospatial functionality and ArcGIS Enterprise (including Portal for ArcGIS) provides the spatial server tier. ArcGIS Enterprise provides all geospatial processing and geographic data services to retrieve spatial data stored in an Esri enterprise Geodatabase within the centralized relational database. Additional geographic data and services such as Esri base maps, Bing



National and Pennsylvania state heritage areas are visible as colorful regions or corridors. The geographic coordinates widget is shown in the lower left corner.

Maps, Google Street View, Pennsylvania State Data Access (PASDA), and other services are consumed from external servers via REST endpoints directly into the client application.

A client-side web application based on HTML5 and JavaScript leverages a middle tier of web services to retrieve data from an SQL server database. The web services tier also provides required server-side application logic, processing, and security via the HTTPS protocol. The web server is Windows based and uses Microsoft IIS and ArcGIS Web Adaptor. The spatial server is a Windows Server also using Microsoft IIS and is configured with both ArcGIS Enterprise and Portal for ArcGIS. The data server is a Windows SQL Server with a centralized database that uses a relational database management system (RDBMS) and serves up both spatial and tabular (non-spatial) data.

PA-SHARE development was paid for entirely with private funds received from a mitigation settlement. The costs to operate and maintain PA-SHARE, now and in the future, are partially offset by revenue received through a subscription-based access model. Subscribers have the option to access the system anonymously through a free basic account or by signing up for either a paid professional or business account. Last year, the PA SHPO collected approximately \$50,000 in fee-based revenue which was used to support salaries, server infrastructure costs, and other operational expenses. Annual revenue is expected to increase as PA-SHARE's customer base continues to expand.

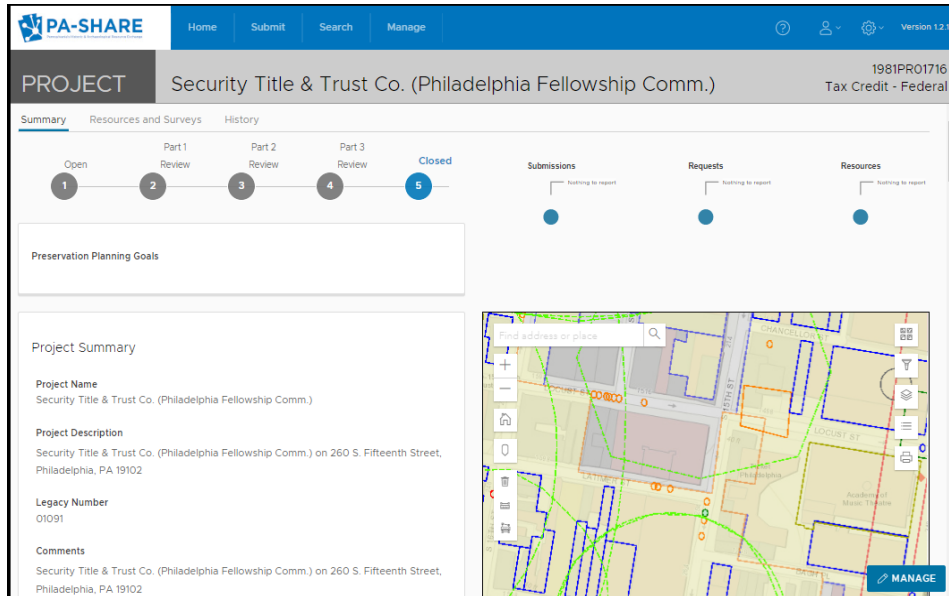
IMPACT

PA-SHARE has resulted in vastly improved customer service, increased efficiency, and greatly reduced processing times both for customers and staff.

- Consultants, historians, archaeologists, city planners, and others doing business with the PA SHPO no longer find it necessary to travel to Harrisburg to review historic documents that can only be accessed from a file room in paper format. Individuals interested in submitting nominations for a Pennsylvania Historical Marker can submit their applications online.
- Determination of Eligibility requests can be processed quickly to find out if a resource is eligible for listing in the National Register of Historic Places.
- Consultants can initiate environmental reviews and rapidly determine whether their construction project is eligible for a building permit under Section 106 and the State History Code.
- Archaeologists can submit information related to above ground or archaeological resources for surveys they are conducting or submit survey proposals.
- Municipal officials can submit requests to have their local historic district certified by PHMC under the Historic Districts Act. The federal Historic Tax Credit (HTC) program and the state Historic Preservation Tax Credit (HPTC) program are also administered through PA-SHARE.

PA-SHARE's online submission and workflow functionality allow PA SHPO customers to submit projects online, check a project's status, receive updates, and communicate with PA SHPO staff members. These features increase efficiency, provide customers with better communication, and reduce the amount of time needed to make submissions or receive approvals. A project workflow model makes it easy for PA SHPO staff to manage and prioritize incoming submissions or assign tasks to other personnel.

Cross agency cooperation with PennDOT has improved dramatically through the integration of Project PATH. PA SHPO also makes public service subscriptions available at no cost to Certified Local Governments (CLG), governmental agencies, members of select historical and archaeology societies, and in some cases, individuals associated with educational institutions. Greater public engagement has been encouraged through contests held to find the best preservation success story showcasing the people, places, programs, and projects embodying historic preservation.



Projects are tracked from beginning to end and customers are provided status updates at every stage during the review process.

SHPOs in many other states recognize the success of PA-SHARE and are seeking to emulate a system which is arguably the best and most advanced online cultural resource system commissioned by any State Historic Preservation Office.

	
Historic Resources in PA-SHARE	Archaeological Sites in PA-SHARE
Historic resources are above-ground buildings, districts, objects, and structures.	Archaeological sites are below-ground and can be pre-historic or historic.
Added to Date, SFY	Added to Date, SFY
13,756	322
Total in PA-SHARE	Total in PA-SHARE
183,094	27,574