



Pennsylvania Above Ground Survey Introductory Annual Report 2021



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Introduction

For the first time since the 1980s, the Pennsylvania State Historic Preservation Office is seeking to provide an above ground companion to the PASS (Pennsylvania Archaeological Sites Survey) Report on annual above ground survey activities throughout the Commonwealth during the preceding calendar year. Prior to this report, reporting on the scale, geographic extent, and methodology of the survey of architectural and other above ground resources in Pennsylvania throughout at least the last forty years – if not longer – has not been consistently available to the general public or to PA SHPO partners.

This report is intended to be the first in an ongoing series of yearly reports that will highlight above ground survey efforts across PA SHPO program areas. It will present changes to the SHPO-endorsed methodology, including any changes or enhancements to the PA-SHARE Surveyor suite

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of tools, challenges, successes, project highlights, and provide a brief data summary of above ground survey activities across the Commonwealth from the preceding year.

This report seeks to document the emergence of Pennsylvania Above Ground Survey (PAGS) as a named program at the Pennsylvania State Historic Preservation Office and the introduction and early use of the PA-SHARE data management system's integrated PA-SHARE Surveyor suite of tools in their first partial year of existence, from August 2021 to December 2021.

This report will:

- summarize the pre-history of PAGS,
- the current use and iteration of the tools as they were developed,
- the current application of the PAGS and Surveyor methodology by other PA SHPO program areas,
- highlight successes of the system and of a selected large-scale project,
- provide a data summary focused on what has been produced using the Surveyor tools from July-December 2021,
- outline challenges, including resolved and ongoing issues,
- briefly introduce programmed enhancements,
- and will briefly address the other PA SHPO programs and areas that are harnessing the same ESRI Survey123 technology for internal SHPO purposes.



Figure 1: Survey site visit to Ridley Creek State Park

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Summary

During 2021, the PA SHPO worked with civil engineering and IT development company VHB to launch PA-SHARE in February of that year and the PA-SHARE Surveyor suite of tools in August.

From Surveyor's launch to the public and to SHPO partners through the end of the calendar year, through the use of the Surveyor tools, the PAGES program successfully centralized and coordinated the submission of nearly 15,000 above ground resources in 30 counties.

Multiple professional cultural resource consultants from nine different professional firms have been trained on using the Surveyor tools for above ground survey projects and have proceeded to successfully work on those projects.

Survey staff at the PA SHPO have successfully addressed and solved a number of problems and bugs with the Surveyor tools that were inevitable as part of the growing pains of transitioning to the new PA-SHARE data management system.

Many of the successes from the first partial year of PAGES and Surveyor are related to the much-needed standardization and centralization of survey methodology, data, and resource processing at the PA SHPO, although it is important to note that the prodigious number of newly identified and updated resources entered into PA-SHARE via the Surveyor tools is a considerable success of its own.



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PAGS as a Program

While survey and its associated activities have always been an integral part of the work of the Pennsylvania State Historic Preservation Office, 2021 was the first year to see the realization of a named program area for the above ground survey and inventory efforts conducted by and through the PA SHPO.

The name “Pennsylvania Above Ground Survey,” with the acronym PAGS, was identified to coordinate with the existing program and acronym for its archaeological companion – the Pennsylvania Archeological Sites Survey program, or PASS.

Prior to the formalization of PAGS at the beginning of the PA-SHARE era of the PA SHPO, the management of both internal survey and externally directed survey was decentralized throughout the bureau. Accordingly, each individual project was primarily managed by the staff member who was the internal contact for the project type within a certain geographic region or program area. This



Figure 2: Before PA-SHARE Surveyor's tools, SHPO staff and intern are pictured wrangling paper during field survey. 2018.

procedure led to extensive variation in both survey methodology and survey results, as well as considerable differences in the amount of time that it would take SHPO data management staff to process any incoming information. As a consequence of this decentralization and variety, annual reporting beyond the presentation of numbers of resources and projects was difficult to conduct – as well as presenting a challenge in terms of the ability to confidently ensure its completeness.

In order to provide the means to centralize survey coordination, standardize methods and data, and increase confidence in the PA SHPO's survey requirements, methodology, processing, and review, the introduction of PAGS and its co-management of the PA-SHARE Surveyor suite of tools with the PASS program was determined to be a significant component of the PA SHPO's transition to the PA-SHARE data management system.

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PA-SHARE Surveyor Introduction

To facilitate the completion of the PA SHPO's need for centralization, standardization, and coordination of survey information moving forward into the PA-SHARE era, the PA-SHARE Surveyor suite of tools was created.

PA-SHARE Surveyor is comprised of a set of desktop and mobile survey tools that were designed to add convenience, enable teamwork, and expedite resource information submission to PA-SHARE. The specific "tools" are made of up three interacting interfaces that are accessible through either a web browser on a traditional computer or via an app on a handheld mobile device, like a smart phone or smart tablet. These three interfaces are the following:

- Surveyor Manager, or simply "Manager," which is intended for use through a traditional web browser,
- Surveyor Mobile, which is optimized for use on a mobile internet browser on a handheld mobile device,
- the Surveyor field app for handheld devices.

Please note that these three tools will each be discussed further in a subsequent section of this report.



Figure 3: This resource was documented using the Surveyor tools in 2021. It is located in Endeavor on Route 666, Hickory Township, Forest County.

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Information collected as part of all Surveyor survey projects is passed through all of these components and ultimately is seamlessly added to PA-SHARE as resource records that are then instantly available to the public and to the PA SHPO's partners. From mobile devices, to the Surveyor Manager desktop project management suite, to PA-SHARE's main inventory and individual resource records, information collected on resources as part of survey projects flows seamlessly.



Figure 4: The Linger Longer Hunting Camp in Susquehanna County, PA. This resource was documented using the PA-SHARE Surveyor tools in 2021.

As a result of the seamless flow of data, images, attachments, and spatial information, teams working together on survey projects have the ability to truly collaborate on their research, planning, documentation, and submission efforts in a way that is not possible anywhere else in PA-SHARE. Multiple users can interact with the data, images and attachments, and spatial information (mapping) on each individual resource record prior to submitting the record to the PA SHPO. Records can be saved while only partially or minimally completed, edited multiple times, deleted, submitted, et cetera, by as many survey project team members as makes sense for the consulting firm's, or other partner's, workflow. Survey project team leads can also communicate back and forth with their team members about the status and quality of the potential future submissions, all prior to submission to the SHPO, thereby ensuring the highest quality resource submissions and potentially minimizing future requests for more information from SHPO review staff.

Furthermore, as a result of the implementation of the same data standards in Surveyor that are used on the main PA-SHARE website, the field-by-field data validation requirements on each resource

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that mean that the “required fields” need to be filled in before the record is allowed to be submitted ensure that the required standard minimum information is always collected for each resource record. This means that information that is collected via survey across all of the various program areas at the PA SHPO is consistent and our users can expect the information they need for research or informational purposes to be available on every resource record created moving forward. This standardization of survey information as a result of field validation requirements means that our state and federal agency, private, and general public users can all be increasingly confident in both PA-SHARE and the PA SHPO as valuable repositories of important research information on the older and historic places identified throughout the Commonwealth.



Figure 5: Mausoleum at the Shamokin Cemetery in Shamokin Borough, Northumberland County, P.A. This cemetery was documented using the PA-SHARE Surveyor tools in 2021.

The Surveyor tools have centralized and standardized survey project management and data collection for both SHPO staff and its external partners, thereby making the SHPO’s expectations for survey clear and consistent for all our users. The SHPO anticipates that this will make survey projects simpler to plan, easier to execute, and more consistently integrated into the PA-SHARE

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database of Pennsylvania's older and historic places, as well as providing the means for more consistently useful and valuable cultural resource information overall.

PA-SHARE Surveyor Comes Online in August 2021

After PA-SHARE went live for the public in February of 2021, Surveyor was introduced to the public as an additional enhancement to the system in August of that year. Designed as a means through which to streamline and expedite resource data entry and survey management throughout a project's planning and fieldwork time spans, Surveyor is a valuing-adding augmentation to the resource submission and project processing procedures that exist as part of the main PA-SHARE website.



Introductory Summary of the Surveyor “Suite of Tools”

“Suite of tools” is the phrase commonly used to refer to PA-SHARE Surveyor’s component parts as one unit. As a consequence of the fact that the component interface, management, and data collection tools were designed to work in close support of each other, the three parts are often referenced as a whole. Even so, it is important to understand that the use of one component does not require the use of both or either of the others – PA-SHARE Surveyor was developed with an eye to the goal of working as effectively as possible within the many various workflows that may suit our agency, consultant, municipal, or other partners.

The three parts of the PA-SHARE Surveyor suite of tools are Surveyor Manager, Surveyor Mobile, and the Surveyor field app for handheld mobile devices. These components will be introduced below.

Surveyor Manager

Surveyor Manager is an interface for registered users of PA-SHARE that have an approved survey project proposal. Through Surveyor Manager, often referred to simply as “Manager,” users can facilitate the completion of their survey project activities throughout the entire timeline of the research, planning, field work, and initial documentation submission processes for their survey project. Survey Manager was developed to be accessed through web browser on a traditional computer, but it is also functional through mobile internet browsers on handheld mobile devices, like smartphones and tablets with internet connectivity.

Surveyor Manager makes it possible for users to manage their survey projects in a platform and format that is seamlessly integrated with PA-SHARE. This desktop user interface is the means through which survey team members and survey project leads can plan, pre-populate, interact with pre-existing PA-SHARE resource data, update, QAQC, and submit resource information collected during survey efforts to the PA SHPO for both review and inclusion in the PA-SHARE database.

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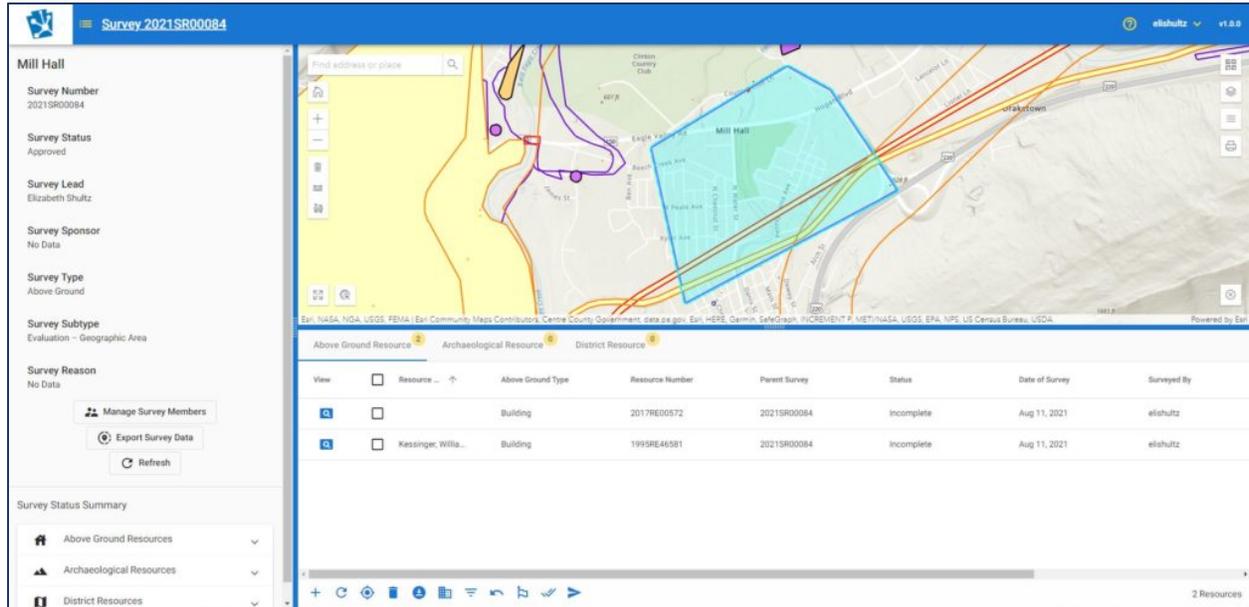


Figure 6: A screenshot of the general Surveyor Manager interface.

From the initiation of survey work, the Surveyor Manager tools allows team leads to manage their team members to facilitate effective collaborative work. Unlike submissions via the main PA-SHARE website, teams using Surveyor can continue to engage in the cooperative workflow that best suits their efforts and enables them to submit the highest quality final product possible. A nearly unlimited number of team members can be added to each survey project in Surveyor Manager, and thereby are granted access to use the field app for Surveyor, which will be discussed more below.

Surveyor Mobile

Surveyor Mobile is the component of the Surveyor suite of tools that is optimized for use on a mobile internet browser on a handheld device. It is a map interface that shows all of the map information that is available in PA-SHARE in addition to the mapped information and boundaries that are specific to only the survey project in question. Only survey project team members have the ability to view the data from their survey project on the map before it has been submitted to the SHPO. Surveyor Mobile's map interface is very similar to PA-SHARE's and includes basemaps, resource layers, measurement tools, search bar, zoom in/out, and default map view.

As a result of its special position as a mobile device optimized map, the Surveyor Mobile tools is positioned to be ideally able to communicate resource information to both Surveyor Manager and the field app for Surveyor.

Surveyor Mobile allows users to:

- View existing resources from the PA-SHARE database in a browser on any size mobile device, as well as a traditional desktop computer internet browser, if desired,

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- Add existing resources to survey projects so that they can be updated from the field and/or as part of the survey project.

Surveyor Mobile allows project team members in the field to view the mapping of the resources that they are collecting in real time. This means that users in the field can understand the spatial relationships between their surveyed resources and ensure that they are not missing anything before they leave that field location. This feature will save our partners time and effort because they will not need to backtrack to collect information that had been missed during an earlier visit to the field location.

Furthermore, using Surveyor Mobile, users can also select any previously identified resource on the map to view the existing information and add it to the current survey for updating via the field app for PA-SHARE Surveyor.

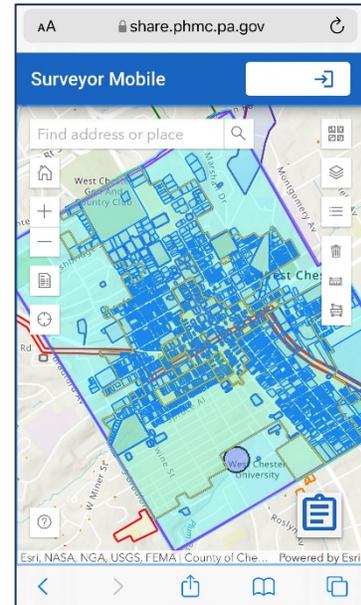


Figure 7: A screenshot of the Surveyor Mobile map.

Field App for Surveyor

The PA-SHARE Surveyor app is a form-centric app that is used on a mobile device, such as a smartphone or internet enabled tablet, to conduct field work on location and quickly collect information on above ground, archaeological, and district resources. The field app for Surveyor is designed to make the collection of resource information as streamlined as possible.

To collect or update information as part of the survey project, users download the free Survey123 by ESRI app from their device's app store and use basic app skills to navigate the simple interface.

After signing in and opening the survey, users can begin surveying with the customized PA-SHARE forms for collecting the standardized minimum information required for above ground, archaeological, or district resources. They are designed to collect the required minimum record data specific to each different resource type.

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The image displays two side-by-side screenshots of a mobile application interface for data collection. Both screens have a green header with a close button (X), the title 'Above Ground Resource Form', a signal strength icon, and a menu icon (three horizontal lines).
The left screenshot shows the 'Resource Type' section with a dropdown menu currently displaying 'Building'. Below the dropdown are four radio button options: 'Building' (selected), 'Non-Building', 'Bridge', and 'Cemetery'. Underneath is a 'Resource Name' text input field. A 'Photographs' section is collapsed, showing a note: 'Note: At least one photo is required. The first photograph should be the "primary" photo'. Below the note is a 'Photo' section with icons for a camera and a folder, and a green bar at the bottom with a white checkmark.
The right screenshot shows the 'Resource Number' section with the text 'Newly-Identified Resource' entered. Below is a collapsed 'Address' section containing three text input fields for 'Street Address', 'City', and 'Zip Code'. Further down are three dropdown menus for 'Foundation Materials', 'Wall Materials', and 'Roof Materials'. A green bar at the bottom features a white checkmark.

Figure 8: Screenshots of the field app for Surveyor.

Summary History of Surveyor Integration into Program Area-Specific Processes in PA-SHARE

While the PA-SHARE Surveyor tools were built on the foundation outlined by PA-SHARE, and the digital records and processes of PA-SHARE and the Surveyor tools interact seamlessly, the human processes related to the integration of Surveyor into the PA SHPO's various program areas developed over the course of the second half of 2021. With PA-SHARE launching for public use in February of that year – and hitting the ground running in terms of use by our partners – Surveyor and the PAGES program faced the challenge of integrating their later-developed tools into established internal SHPO work structures and terminology. Accordingly, the following workflows were developed to ensure a complete and accurate digital paper trail:

- For all survey projects that were not initiated as a result of Environmental Review consultation: Preparers will submit an Independent Survey Proposal from the Submit tab on PA-SHARE and will be the default Survey Project Lead, unless edited, and will make choices from the dropdown menus that best reflect their project's origination and purpose. They will upload the attachments that were deemed necessary for the proposal's review by the specific PA SHPO program area with which their project engages, although the system itself will not require these attachments to successfully complete the submission. For example, the Tax Credits and Incentives Division of the PA SHPO will determine which, if any attachments, are required for a complete survey proposal submission for a Keystone Grant-funded survey project. Users will follow the standard practices conveyed in their training on the use of PA-SHARE Surveyor to plan, execute, complete, and submit their work. Upon submission of the information, the PAGES coordinator will create a manual submission on the project in PA-SHARE that includes the relevant SHPO staff member to ensure that they are content with the final products submitted. The PAGES coordinator will link the survey project to any other relevant projects that have a record in PA-SHARE.
- For survey projects that were initiated as the result of Environmental Review consultation: Following the submission of an Environmental Review project via PA-SHARE, preparers will respond to the ER reviewer's Request for More Information – Survey Proposal on the existing project. For large-scale survey projects, ER reviewers will direct the phasing of the survey work by making multiple Requests for More Information. For example, a large-scale survey project covering multiple municipalities could see a request for a survey proposal submission for each studied municipality. Preparers will complete the survey project proposal by making choices from the dropdown menus that best reflect their project's origination and purpose. They will upload any attachments that the Environmental Review division deems necessary for an effective review of the scope of the survey project, although the system itself will not require these attachments to successfully complete the submission. Users will follow the standard practices conveyed in their training on the use of PA-SHARE Surveyor to plan, execute, complete, and submit their work. Upon submission and review of

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the resources, the ER may determine that selected resources require evaluation level documentation and review. If this occurs, the reviewer will respond to the project with a Request for More Information for the specific resources, and the preparer will be directed to submit this information through the main PA-SHARE website submission process.



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Success Highlights

As mentioned above in the Summary section of this report, the successes of the first partial year of the formalized PAGES program using PA-SHARE Surveyor can be both tangibly and intangibly assessed. The successful implementation of the system, the numbers of resources captured, the extent of professionals trained, et cetera, are easily tangibly measured and allow PAGES to be able to quantify the growth of the program. Other successes that this report seeks to highlight are more intangibly based on the experiences of internal SHPO staff and feedback that the SHPO and PAGES have received from users of the Surveyor suite of tools.



Highlight One: Field and Team Collaboration



Figure 9: A group of PA SHPO staff enjoying a historic metal truss bridge in Lebanon County, P.A.

On the main PA-SHARE website, share.phmc.pa.gov, while SHPO partners may work collaboratively on the research and external compilation of information, the submission process is a solitary affair. The same user submits the shapefile for the resource boundary, or creates it by hand, enters the correct descriptive and historic information into the required fields, and uploads

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confirmed accurate images and attachments. At the PA SHPO, we are aware that this does not always align with the most effective or established workflows of our partners. Accordingly, one of the highlights and successes of the Surveyor suite of tools is the ability to permit and *promote* the collaborative work of our partners in the pre-submission stages of survey projects. Using Surveyor Manager, teams can simultaneously work on resource submission records and update, map, provide images, et cetera, for records created or identified by other team members in real time, meaning that teams can truly work together to effectively expedite the resource documentation and submission processes. Surveyor also includes built-in mechanisms to allow team members to communicate with each other and project leads about the completeness or nuances of specific individual resources – all online in a streamlined interface without having to do tedious data entry of the same information multiple times in multiple places. Survey Project Leads can therefore QA/QC documentation inside the system prior to submission to the SHPO, thereby potentially minimizing future requests from SHPO staff for later clarification or more information.

Furthermore, this collaboration extends to the Surveyor field app. Resources that were pre-populated in Surveyor Manager by team members can be accessed and updated in the field by others in real time. This means that someone could be working in the office while others are in the field, and their collaboration on documentation is seamless.



Figure 10: Sunny Side Paddle Park in Bellefonte Borough, Centre County, P.A. This resource was documented using the PA-SHARE Surveyor tools in 2021.

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Highlight Two: Expediting Resource Recordation and Submission

As a mechanism of PA-SHARE that is available to users subscribed at the Pro, Business, and Public Service Subscription levels, the Surveyor suite of tools was designed with the goal of providing the means to expedite and streamline the team and data management of survey projects. PAGS has received anecdotal feedback from several users indicating that the use of the PA-SHARE Surveyor tools has significantly reduced the amount of time their work takes. Based on testing done by internal SHPO staff in comparison to resource data entry and mapping in the former CRGIS system, the use of Surveyor to data enter and submit/publish an individual resource has been cut in half. Furthermore, again based on internal SHPO staff experience using Surveyor in comparison to the workflow pre-PA-SHARE, the processing of submitted information and its public publishing for public access has been reduced from months to minutes.



Figure 11: Weaver's Ice Cream in Gregg Township, Union County, PA. This resource was documented using the PA-SHARE Surveyor tools in 2021.

There are other reasons that the use of the Surveyor suite of tools is effective in the expediting of resource recordation and submission:

- Using the Surveyor tools, survey project team members are able to identify and edit existing PA-SHARE resources that are found to be a part of their survey projects more easily. By pulling in real-time data on existing resources from PA-SHARE, the survey team can better plan and complete documentation updates without re-doing any existing work that remains accurate and relevant.

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- Using Surveyor Manager, survey project team members have the opportunity to pre-populate resource records with any known information before heading into the field. By so doing, teams have the opportunity to better plan routes, delegate tasks, amongst other workflow optimizations, as well as being able to minimize the amount of information that needs to be captured in the field – all of which result in significant time savings.
- Through the collaborative nature of Surveyor Manager, survey project team leads can potentially reduce time spent on Requests for More Information from SHPO staff by engaging in QAQC within the Manager platform. Users can view the information collected in the field in real time, confirm that the planned information is documented accurately, make real time changes to fieldwork to increase efficiency, make decisions without field staff returning to the office, and review eligibility recommendations made by the team members. By reviewing the work of field teams, survey project leads can ensure accuracy in both documentation and assessment and therefore potentially reduce review time.
- Surveyor Manager further expedites resource recordation by providing keystroke optimizations. While entering information via Manager, users can tab and type through the forms fluently, increasing speed and reducing fatigue.
- Through the Surveyor suite of tools survey data can be sent directly to the PA SHPO for review and uploading into PA-SHARE without needing to retype data that already exists elsewhere into another submission module or window. Furthermore, Manager facilitates communication between the PA SHPO and the survey team with the ability to send records back and forth for revision and review.

Highlight Three: Baseline Data

While more detailed information on this topic can be found in the 2021 Surveyor Data Summary section of this report, it is important to highlight the resource recordation achievements of PAGS and Surveyor from the five months covered by this report. The remarkable number of newly identified and updated resources entered into PA-SHARE via the Surveyor tools is a considerable success. The collection of new or updated information on nearly 15,000 resources via Surveyor in only five months demonstrates a significant leap in the data management capability of PAGS and PA-SHARE overall. In years prior to both the implementation of PA-SHARE and the SHPO File Digitization Project, the annual above ground increase in newly identified resources was below 3,500 for an entire year. Achieving more than double that number in half the time with the Baseline Survey Project alone clearly demonstrates the ability of the Surveyor suite of tools to handle significant volumes of information with ease.

Highlight Four: Total Offline Fieldwork

Before the close of the calendar year, the PAGS program was able to successfully respond to user feedback regarding the necessity of offline basemaps by developing, testing, and deploying a process to take survey project fieldwork entirely offline. Consequently, in very rural places and deep valleys

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of the Pennsylvania landscape, survey project team members will not be stymied in efforts to collect accurate spatial information using the field app for Surveyor.

The successful deployment of offline basemaps for totally offline fieldwork using the Surveyor app demonstrates the PAGS program's current ability to respond constructively to user feedback and apply GIS and IT Development topics to proactively manage the Surveyor tools of the PAGS program to their maximum effectiveness for all PA-SHARE Surveyor users.



*Figure 12: Saints Cyril and Methodius Ukrainian Catholic Church in Berwick Borough, Columbia County, P.A.
This resource was documented using the PA-SHARE Surveyor tools in 2021.*

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2021 Surveyor Data Summary

Counties with Expanded Documentation as a result of PA-SHARE Surveyor, August-December 2021

COUNTY	2021 SURVEYOR RESOURCE COUNT
Allegheny	1
Beaver	1
Bedford	4
Bucks	1
Cameron	137
Centre	595
Chester	2,627
Clarion	293
Clearfield	565
Columbia	168
Dauphin	1
Elk	560
Forest	753
Franklin	5
Fulton	1
Jefferson	880
Lackawanna	581
Lycoming	1,329
Monroe	8
Montgomery	4
Montour	198
Northumberland	457
Snyder	766
Somerset	2
Sullivan	211
Susquehanna	1,461
Union	798
Westmoreland	8
Wyoming	1,963
York	2
TOTAL	14,452



Figure 13: Clearfield Jewish Council building in Clearfield Borough, Clearfield County, P.A. This resource was documented using the PA-SHARE Surveyor tools in 2021.

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Looking Forward in 2022

Getting PA-SHARE's Surveyor tools up and running took a significant investment of time and patience from both SHPO staff and PA-SHARE's earliest using partners. The PAGS program would like to extend its hearty thanks and gratitude to all of the users who worked with us on and using Surveyor in 2021. We look forward to continuing our work together for many years to come!

Surveyor has already seen new enhancements to its tools in 2022 that were developed based on feedback from its users, and which have been deployed in the first quarter of the calendar year. Between this set of enhancements and 2021's ability to respond to user feedback about the use of offline basemaps, a positive and collaborative future is portended for both the PAGS program and the PA-SHARE Survey suite of tools.



Figure 14: Milk Can Corners signage in the unincorporated community of Milk Can Corners in Susquehanna County, P.A. This resource was recorded using the PA-SHARE Surveyor tools in 2021.