# Historic Preservation — Digital History Design

Jackie Aguirre, Daniel Gugel, Xiuwei Li, Aviva Moshman, Jooyong Song

Under the supervision of
Professor T.J. Rainsford
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An initiative of the National Center for Smart Growth

Gerrit Knaap, NCSG Executive Director
Kimberly Fisher, PALS Director

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## Introduction

The goal for this project was to create the early stages of a web development project for the Prince George's County Parks and Recreation Department. Our team created the initial wireframe designs, identified problems for future aspects of the project, and provided recommendations for the next stages of development.

The original project requirements included developing a website design for Parks and Recreation historical sites. However, our project scope changed to focus on the historic Compton Bassett house.

Compton Bassett is a former plantation in Upper Marlboro, Maryland dating to 1783. The historic site consists of 14 buildings and is suffering from age and degradation. As a result, the site is not safe for the public to visit and needs to be preserved through an online virtual exhibit.

The website will serve two different stakeholders: the public and researchers. It will allow the public to explore historic sites virtually by manipulating 3D models of the sites and accessing information about the sites. Researchers will be able to access sensitive data by registering for an account.

Our client and point of contact for the project was Dr. Stefan Woehlke. Our team also communicated with Partnership for Active Learning in Sustainability (PALS) Director Kimberly Fisher, PALS Graduate Assistant Sophie Kotzker, and National Center for Smart Growth website developer Aishwarya Biddatanda.

## Methods

We began the project by outlining five essential stages:

1. Initial project setup and background research on problem
2. Project plan development and maintenance
3. Project plan and requirements adjustment
4. Research, develop and update design wireframes
5. Final project outcome and deliverables

In each stage of the project, we created subtasks and mapped out the duration for each task. This provided us with short-term goals that kept us on track to fulfill the project objectives on time.

For each stage, we used various information-gathering methods to understand the problem background and the client's needs. Before meeting with stakeholders, we researched Compton Bassett and the County Parks and Recreation Department to learn our client's background and the historical site's conditions. We also met with a digital history subject matter expert, Professor T. J. Rainsford, who advised us on how to approach this project.

After preparing interview questions based on this research, we conducted an initial stakeholder interview meeting with Dr. Weohlke, Kimberly Fisher, and other stakeholders. After the

interview, we were able to clarify the project goals and expectations. We also interviewed several other stakeholders to gather their thoughts and suggestions on the project.

With information from various sources, we began wireframe design, based on user experience research into what makes a good user interface. We also incorporated design elements that would provide an easy and smooth experience for website users. We also researched wireframe design software and chose based on functionality, usability, and complexity, opting for Adobe XD, one of the most popular and standardized tools for interface design and prototyping.

Once the wireframes were created, stakeholders reviewed them and provided suggestions to better meet their needs. The project finished with a presentation, finalized wireframes, and this report, which includes further development plans and recommendations for the client.

### *Obstacles*

We encountered various obstacles throughout the project, including a change in the project scope. To deliver high-quality results to the client in a limited time frame, we adjusted the project objectives and goals. We composed low-fidelity wireframes to better show the various interfaces that will help map out the website.

Another obstacle was unfamiliarity with 3D data, which made it difficult to visualize different types of data into wireframes. Fortunately, a few stakeholders had previous experience with 3D modeling data and helped us gain a better understanding of how to approach the data and incorporate its requirements into our wireframes.

## Description

### *Wireframes*

As mentioned, the project's tight timeframe led the team to complete and deliver a set of low-fidelity wireframes for website prototyping.

Each member of the Digital History Design team developed a wireframe that represented the appearance of a page from an online preservation site for Compton Bassett (and by extension, other historic sites). Researcher access was an important for the stakeholders and to this end, the team also created wireframes to mimic a research-oriented web design. In total, the team created five sets of wireframes each displaying an aspect of how the online preservation site could look, including:

- A homepage wireframe that previews a featured exhibit along with accompanying general information relevant to the Parks and Recreation Department.
- A wireframe displaying what a specific exhibit could look like, with collapsible sections that would explain some history behind the exhibit, and extensions that could integrate with third party tools, such as WebGL and WebXR, to show a virtual reality version of a historic site.
- A set of wireframes showing a page configured for researcher access, including general data presentation pages with objects researchers can download or edit.

- Donation and “about us” pages that visitors can use to find out more or to help sustain the exhibits.

The wireframe images below provide insight into how an early version of the exhibit website might look. (Separate wireframe files with higher resolutions are attached.)

Figure 1 - Home Page

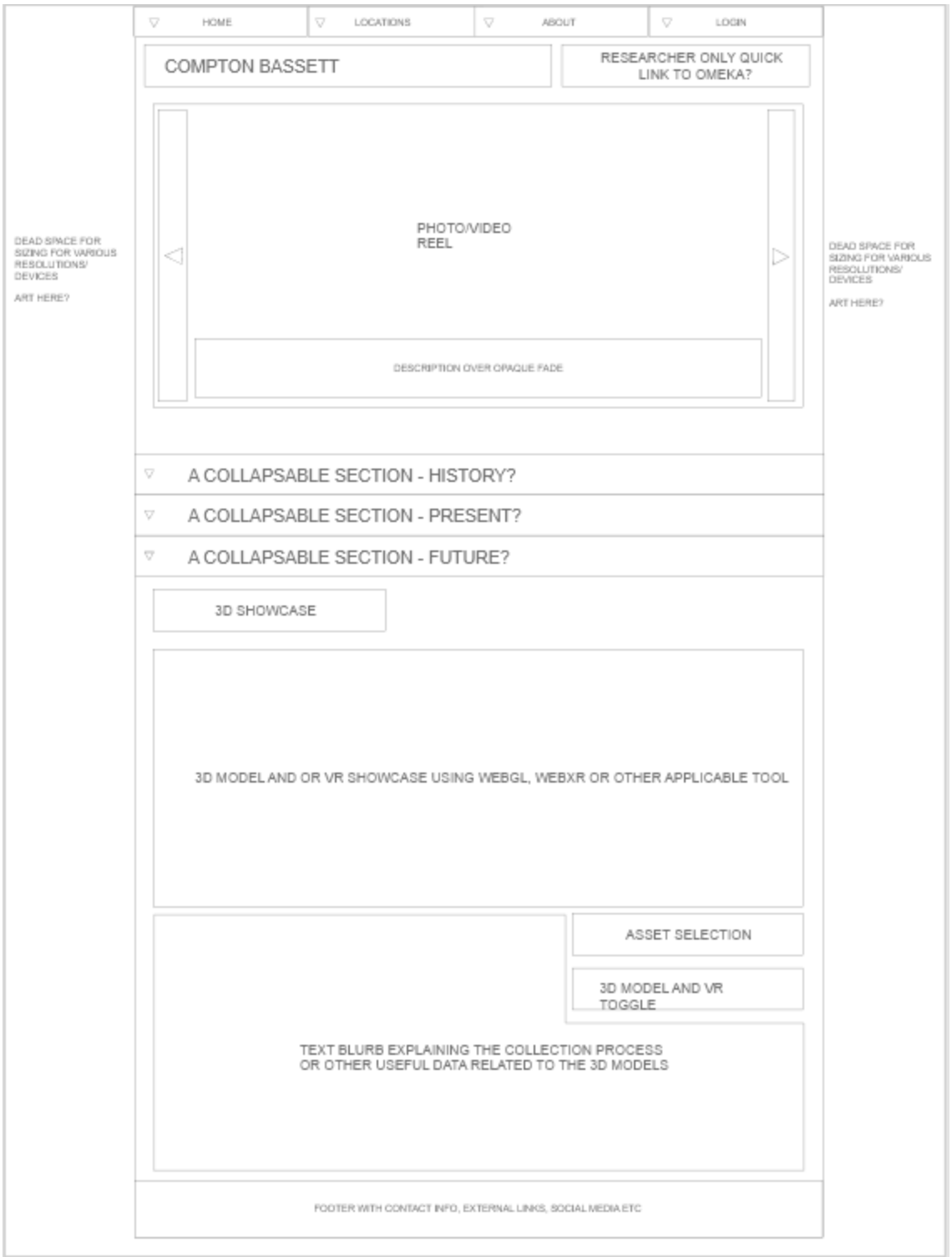


Figure 2 - Compton Bassett Page

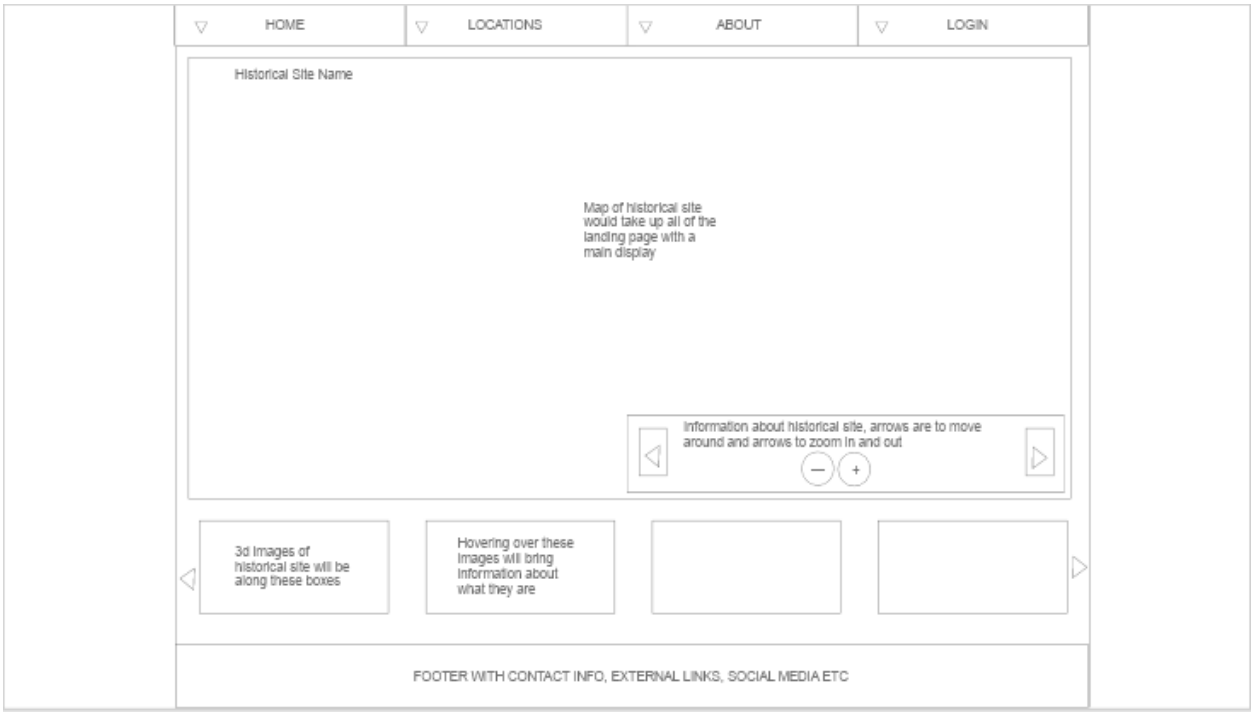


Figure 3 - Historic Site Page

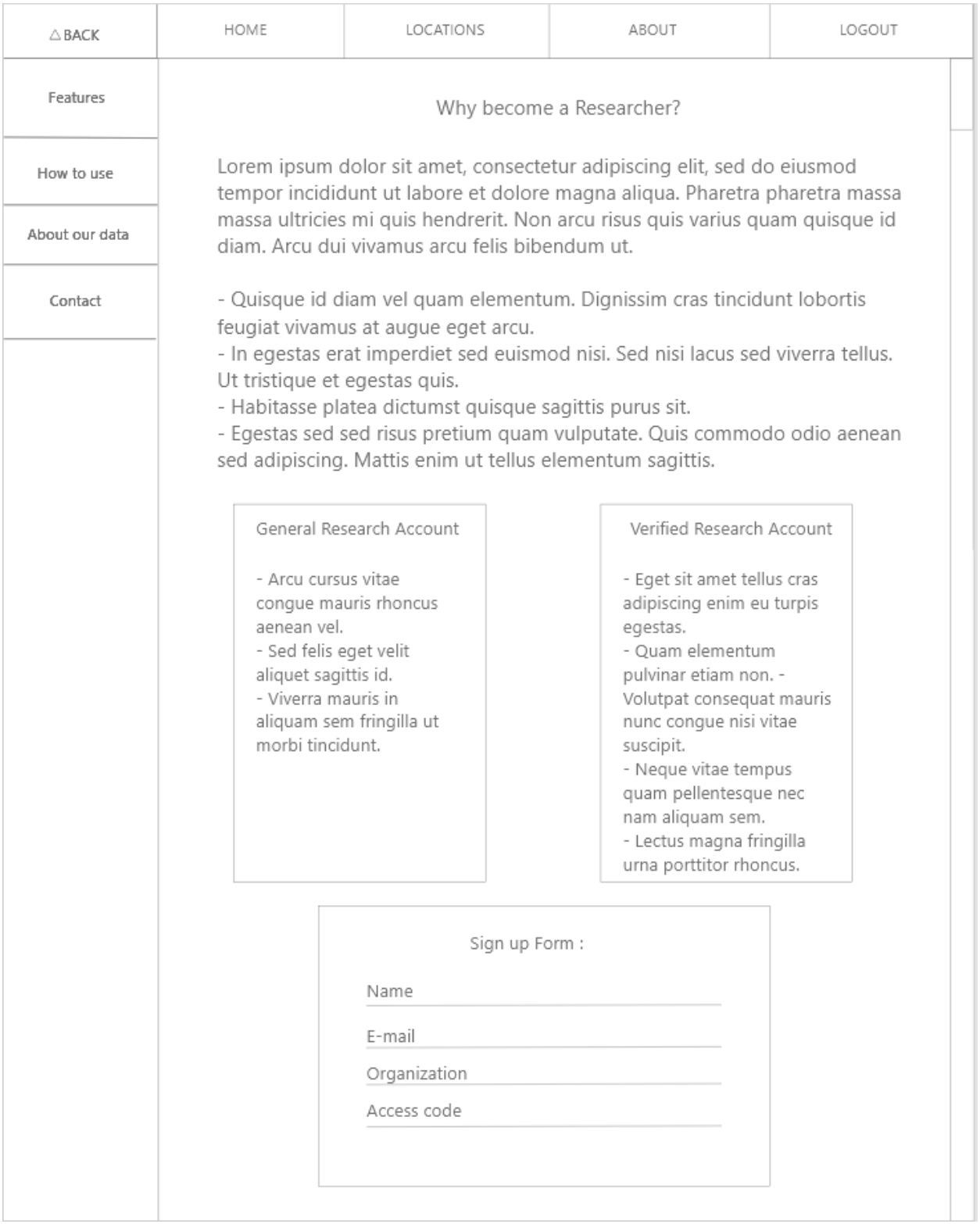


Figure 4 - Researcher Sign-up Page

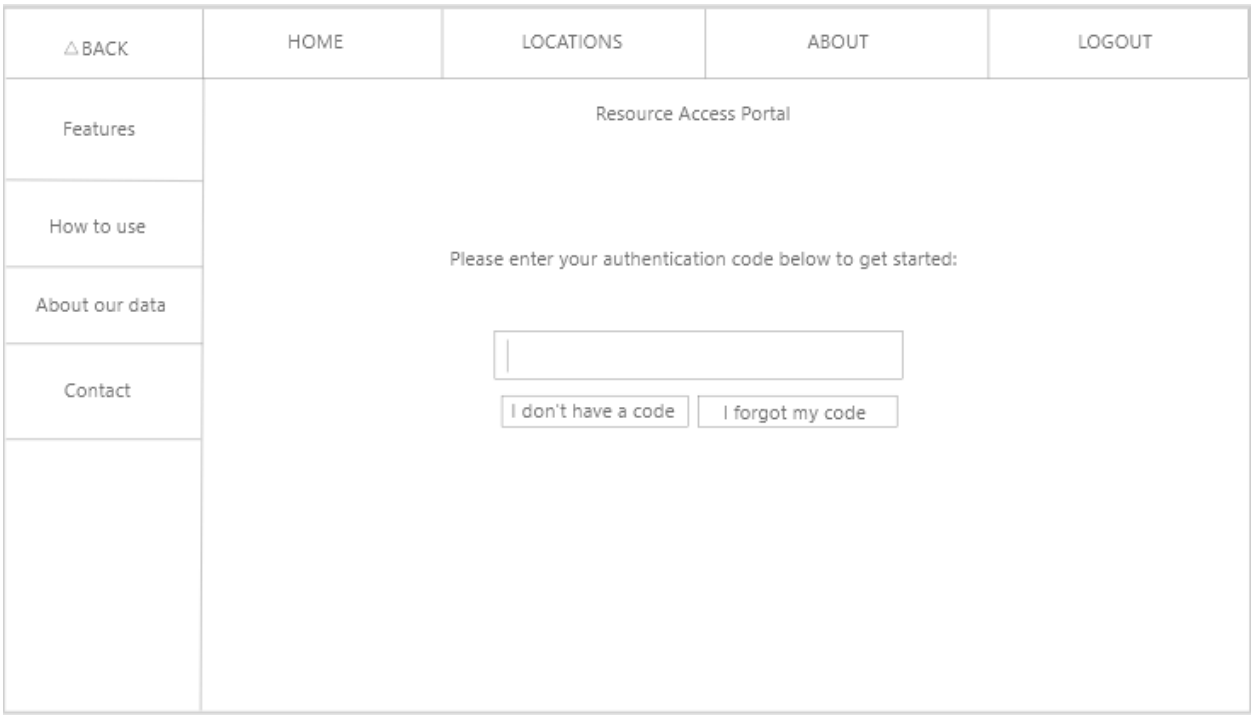


Figure 5 - Researcher Access Page

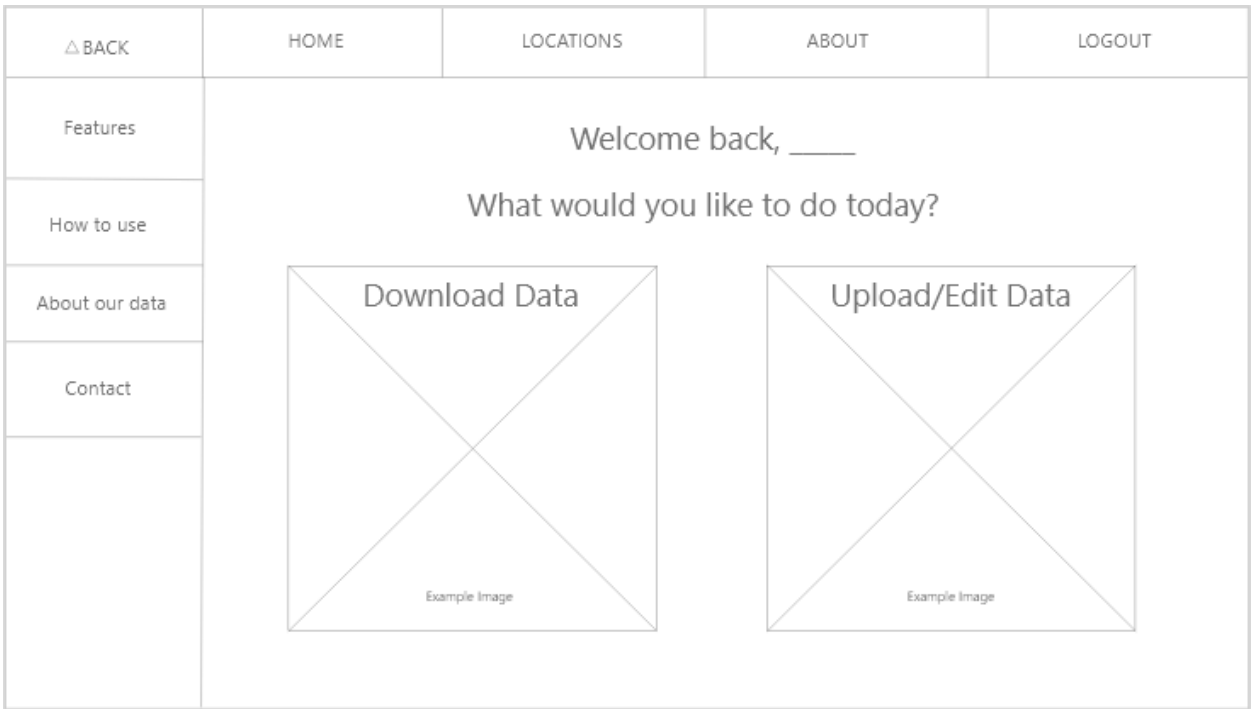


Figure 6 - Researcher Welcome Page

Figure 7 - Researcher Data Portal, Page 1

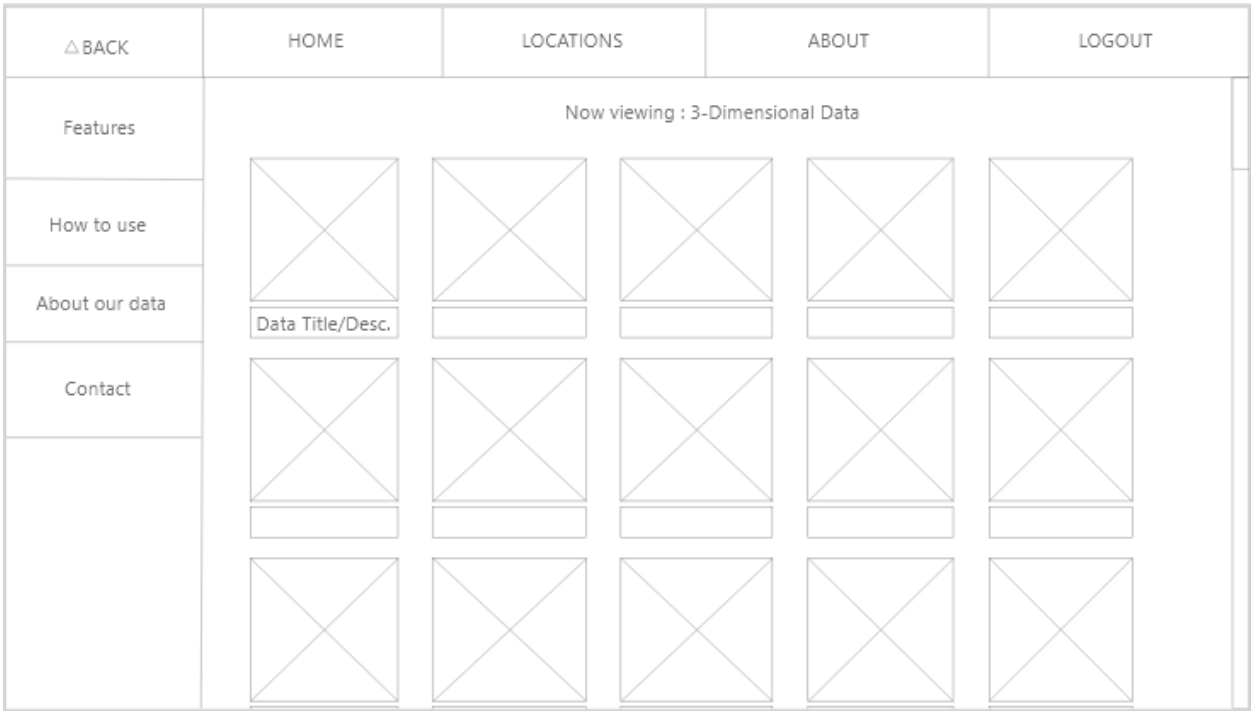


Figure 8 - Researcher Data Portal, Page 2

Figure 9 - About Page

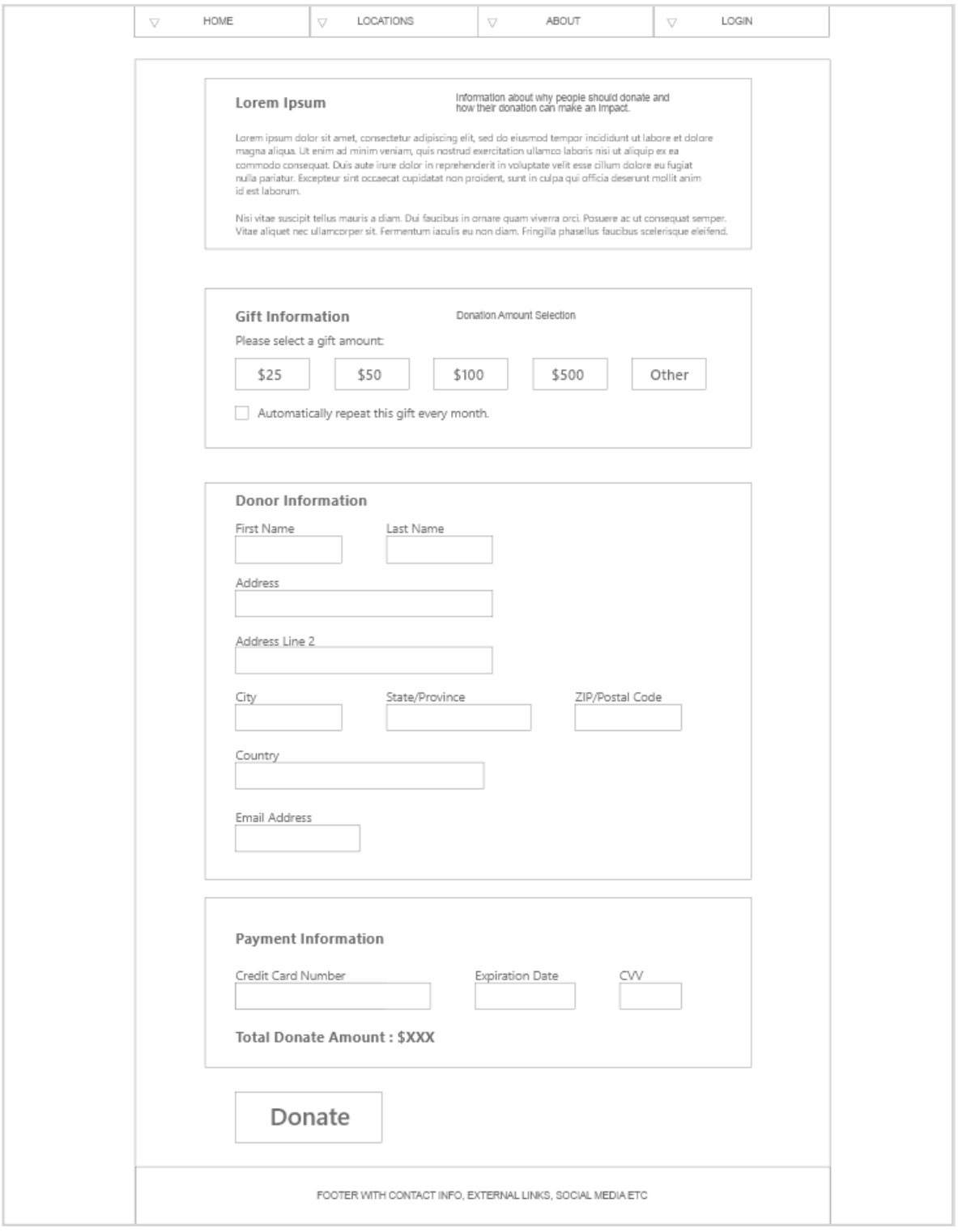


Figure 10 - Donation Page

While not high fidelity, the sample wireframes provide the County Parks and Recreation Department and the UMD Preservation Group with a direction that may be helpful in decision-

making for Compton Bassett and similar exhibits. Using the wireframes as a starting point, a design and research team with web-development skills can begin to create the actual site and start the digital containment of the aging exhibits.

### *User Manual*

The user manual answers common questions that users may have when using the website. It describes how to access the site and perform different tasks. It's important to include a user manual to help users easily understand how the website works. The manual includes instructions on how to:

- register for a research account
- sign-in to a research-verified account
- make a donation
- access different historic sites
- navigate in the Compton Bassett online exhibit page.

Please see the attached file for the full version of the user manual document.

## Recommendations

To continue this project, the team would conduct user-testing on the wireframes and work with stakeholders to gain feedback. After testing we would create higher fidelity prototypes with design improvements based on the feedback. We would repeat the testing on these prototypes for final feedback. We would then do user testing to ensure there are no performance issues.

One goal for this project was to do an early assessment of future considerations that will be encountered in future aspects of this project. Below is a categorized comprehensive list of considerations.

### *Functionality*

- Tiered research data access via logical groups can be handled at the account management level via Unix groups or active directory groups.
- Two-factor authentication, Google 2FA, is recommended.

### *Infrastructure/Performance*

- We recommend implementing an N-scalable server infrastructure. This can be done using a load balancer such as HAProxy, and any number of backend servers. It can start with one backend server and scaled as the project and traffic grows.
- Using a dedicated server such as Omeka, will provide a bandwidth separation between the web servers and a download server.
- Hosting the website on a Linux server such as Ubuntu Server or CentOS would allow minimal resources to be used for the operating system and simplify management over time.

- The Linux package “Keepalived” allows configuration of more than one server in a “highly available” configuration. This can be done at the load balancer level, or anywhere else it’s appropriate.
- WebGL and WebXR are two APIs that will be useful for implementing a 3D ViewModel on the website. These can be implemented in Javascript, which offers more modular control over its implementation.

***Data Preservation***

- Since the project’s goal is indefinite preservation of data that can’t be recreated, some thought must be given to media and storage method. A 3-2-1 backup schema is highly recommended.
    - 3 unique and separate copies
    - 2 media types (general computer storage and tape storage)
    - 1 offsite

  This 3-2-1 backup schema can be increased as necessary. More unique copies, media types, and offsite locatios create even greater resiliency against data loss. Offsite locations are necessary to protect from natural disaster, building disaster, or other localized event impacting hardware. Recommendations for offsite backup include:
    - AWS S3 Glacier Deep Archive
    - Azure Archive Storage
    - BackBlaze B2 Backup & Archive
- Hard drives, if they survive for the long haul, generally last about seven to ten years. Commonly they fail before this, making it important to implement a local redundant storage configuration on important machines, such as RAID, versions 1, 6, or 10, depending on the data’s importance. The data on these hard drives will need to be migrated every six to eight years until a faster and more resilient storage technology is developed.

***Legal Considerations***

- Limit/tier the access to intellectual property.
- Protect any relevant tax or financial requirements related to accepting donations

***Security***

- Ensure appropriate system logging tools are developed for the web server. All instances of data access should be logged and referrable. It should log the:
    - user account
    - IP address
    - browser
    - operating system of host
    - data that was accessed, and/or downloaded
    - time of access.

- Limit access to the admin portal to private IP networks; a VPN should be required to access any management portions of the system.

**Conclusion**

Thank you for working with us on this project. We're glad to have had this experience and to contribute to preservation of our local community's history. We hope that the information here will serve you well after handoff, but if you have any questions please reach out to any of our team members:


- Xiuewi Li - xiuweili99@gmail.com
- Aviva Moshman - avivamoshman@gmail.com
- Jackeline Aguirre - aguirre.jph@gmail.com
- Daniel Gugel - dangugel@outlook.com
- Jooyong Song - jooyongsong98@gmail.com