# Title: Aggie Tree Track: USU's Digital Arboretum Management & Community Engagement Platform

Student Name: Dallin Moon

## *Narrative*

College campuses act as green space hotspots providing a lot of benefits to the community. As Utah State University (USU) and the surrounding Cache Valley region experience rapid growth and urbanization, preserving, nurturing, and highlighting the value of campus trees become increasingly essential, especially when the trees represent the largest of their species.

The USU campus is considered a Level 1 Accredited Arboretum already, with the strong possibility of rising to level 2. As such, USU has many called State Champions, which is a status that is tracked by the Utah Community Forest Council (Utah Community Forest Council). These large trees are especially significant because they embody decades of ecological and cultural history, helping to establish a strong sense of place on campus. A recent study noted that the landscape of a university— especially its trees and green spaces—plays a central role in shaping public perception (Cruz, et al, 2025). In turn, this influences how prospective students, newcomers, and alumni experience and remember the institution (Cruz, et al, 2025).

Research demonstrates that urban trees provide measurable benefits, including carbon sequestration, air quality improvement, stormwater management, energy savings, biodiversity support, and enhanced human well-being (O'Brien et al., 2022). Some specific metrics available come from three different studies. One involving a survey sent to Vermont residents states that 'the respondents felt forested landscapes provide a sense of place and play an important role in the development of one's personal identity through long-term connections and memories' (Science Direct). Another study referenced in the same article discusses financial benefits of urban forests. "Specifically, they found that a 10% increase in tree cover within 100 m of homes increased the average property sale price by 0.48% and within 250 m increased the sale price by 0.29%" (Science Direct). Campus-specific tree inventories have proven effective in quantifying benefits to the University directly, enabling institutions to demonstrate the economic and environmental value of their canopies—often through student-led efforts that combine service learning with data-driven insights (Cruz et al., 2025). One study involving Texas A&M, which has more than 3200 trees, reported annual savings of just over $43,000 due to the environmental benefits of their

trees (Cruz, Jasmin R). USU has over 7000 trees, and it would follow that they provide substantial financial benefits yearly to the university.

It is apparent that protecting and managing these trees is important. It is also imperative to the mission of USU that people know more about these trees. This applies not only to the Logan campus, but all of the USU campuses. The data should be managed well or created to improve management's ability to make effective decisions and take advantage of the incredible urban forest here in Logan and the possibilities for all other campuses as well. Leveraging what we have and designing a future where these trees play a part in what it means to be an Aggie is critical. That is why a formal, standardized method of managing this data is very much needed.

This project will focus on two objectives, with the goal of achieving three outcomes. The objectives and outcomes are detailed below.

## *Objectives*

*1) facilitating efficient data collection and ongoing management of the campus tree inventory by arborists and authorized users, and*

*(2) enabling exploration, education, and outreach by allowing students, faculty, and visitors to query and visualize tree data*.

## *Outcomes*

- Enable USU employees to better manage and care for the trees on campus.
- Create opportunities to educate students and visitors about trees on campus.
- Improve recruiting by facilitating personal experiences and connections to campus through exploration.

## *Methodology*

The Aggie Tree Track project aims to develop a system of integrated apps to manage, tour and explore trees across the Logan campus (Figure 1). The system will comprise two distinct applications that will be designed for different user groups:

*Note. The figures below represent how the desktop view will appear, but a mobile view will also be designed to enable users to effectively navigate the apps from phones and tablets*.

**Aggie Tree Explorer** (Public facing)- This self-guided web experience serves the USU and Logan community with two features to learn about different tree species across campus (Figure 1a).

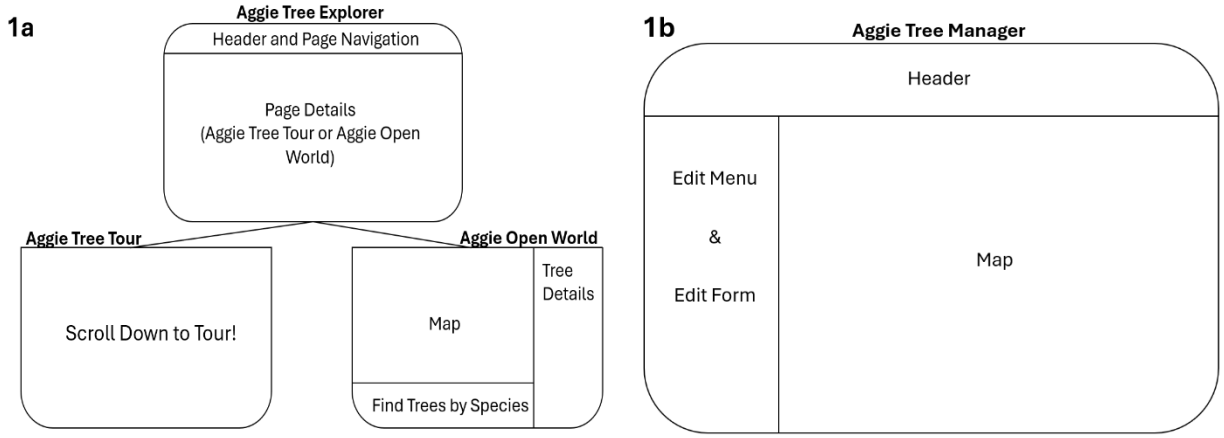
1. **Aggie Open World** – An exploratory and interactive tool allowing users to browse and learn about the diverse tree species across Logan campus.
2. **Aggie Tree Tour** - A curated experience highlighting the state champion trees on the Logan campus

By combining both the features into a single web experience, users can seamlessly switch between exploring campus trees and structures tours in one accessible location.

**Aggie Tree Manager** (Internal Use) – This administrative application enables the arborists team to create and edit tree inventory data. They will be able to document new plantings and monitor and manage existing plantings (Figure 1b).

The data necessary for this project are the existing trees and comes from Dane, the USU Arborist. This data has attributes such as tree species and whether it is a State Champion. It will be updated to include interesting facts, habitat region, watering and sunlight needs and an attribute to store links to external sites to facilitate learning beyond this project. Other supplemental data for visual purposes in all included maps will be buildings, pathways and roads on campus.

**Objective 1) Aggie Tree Manager Development**




The Aggie Tree Manager will be made using either Esri Experience Builder, which is a simple way to enable intuitive editing of the tree data, or Field Maps, which is an existing app that would require configuration with our data. In either case, it will display a map of campus with all the data mentioned above and allow existing trees to be edited by

selecting them. This will open a form prefilled with the existing data, which can be updated and saved directly to the data used by all the apps in this project. Meaning updates are seamlessly incorporated into the Aggie Tree Explorer. Trees may also be deleted and, more importantly, created by selecting an option given to create data. A tree may then be placed on the map, which opens the form with all the attributes to be filled out regarding the tree. The data created (and any edits made) can be set up to go through a quality control check before being seamlessly integrated into the system.

**Objective 2) Aggie Tree Explorer Development and Design**

The Aggie Tree Tour app will be lightweight and easy to use. It will be in the form of a StoryMap, an example of which is listed in our references, and will allow users to scroll through a self-guided tour. This version will improve on the great work that has already been put into the existing StoryMap. The tour will begin at a specified location and highlight a pathway to the next State Champion tree. Details regarding that species of tree, the age and size that makes it a State Champion, and other interesting facts will be displayed. This will be followed by another path being highlighted on the map leading to the next State Champion and so on. The tour will not pass by all of the State Champion trees as some of them are isolated from the rest them, but at the end of the tour these trees will be shown, and a recommendation made to use the Interactive Map to explore and find the remaining State Champions.

The Aggie Open World will be made using the Esri Developer ArcGIS Maps SDK for JavaScript. This development kit will enable more complex symbology rules to be applied to the tree layers making the map efficient and aesthetically pleasing. The app will allow users to select trees of interest on the map and view more information about that specific tree and its species. It will also enable users to search campus for trees of specific species, habitat regions and other attributes. This ability to search and filter will allow easy exploration without the fuss of clicking on every tree individually.

This system of apps will enable USU to achieve the desired outcomes by directly improving management of the trees and creating opportunities for education and community involvement on campus. Once development is complete, replicating this project for other campuses or universities will be a simple matter of transferring functionality to use data for the desired new location. This project could also qualify the USU Arboretum as a level 2 and thereby increase the institutional ability and responsibility to protect, conserve and educate about these trees.

Science Direct https://www.sciencedirect.com/science/article/pii/S1618866722002503\

Utah Community Forest Council https://utahurbanforest.org/amazing-trees/big-tree-directory

Gumprecht B. 2007. The campus as a public space in the American college town. *J Hist Geogr*. 33(1):72–103. https://doi.org/10.1016/j.jhg.2005.12.001.

*Cruz, Jasmin R., et al. "Developing a University Campus Tree Inventory and Determining the Value of the Campus Canopy through Student Service Learning." HortTechnology, vol. 35, no. 5, 2025, pp. 687–698. https://doi.org/10.21273/HORTTECH05713-25. Accessed 08 Feb. 2026*