

A Pathway for Hyperlocal Digital Asset Mapping

Recommendations for Churchill Public Asset Visibility & Effective Usage



(Churchill Borough, 2015)

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Abstract

Churchill Borough, a small residential community located east of Pittsburgh, faces a similar challenge to other municipalities. Its public assets exist, but residents and visitors lack a centralized and accessible way to discover and engage with them. This fragmentation of information can lead to underutilization of public resources, reduced civic participation, and a risk of planning duplication.

This project explored digital asset mapping as a response to this challenge. The theoretical framework developed by Hujanen et al. (2021) was used to analyze two case studies: Penn Hills Passport and Find It Cambridge. These platforms were in different stages of the identified developmental progression. The final stage of this process has not yet been reached.

A preliminary interactive GIS map was developed using ArcGIS Online, covering public assets across Churchill, Forest Hills, and Wilkins Township. The map includes filterable layers by asset type, integrated photographs, and a community survey function to support resident input.

The findings suggest that a regional approach offers the most sustainable path forward. A standalone platform for Churchill Borough may lack the scale needed for long-term viability. Collaboration with neighbouring municipalities, combined with inspiration from existing platforms, would increase the diversity of available assets and improve the platform's value to residents, visitors, and local organizations. This project serves as a proof of concept and a foundation for that broader conversation.

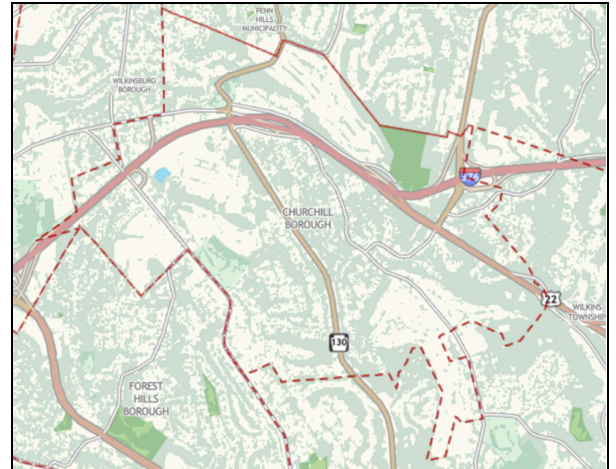
Introduction

Churchill Borough, PA, is a primarily residential community located 10 miles east of Pittsburgh in Allegheny County.

The Borough features tree-lined cul-de-sacs and easy access to and from the Parkway East. It covers approximately 2.5 square miles and has a population of just over 3,000 residents.

The geography of the Borough is largely hilly, with significant wooded areas and floodplains along Chalfant Run and Saw Mill Run. Route 22 and Interstate 376 are the access points to the wider Pittsburgh region.

(Churchill Borough, 2026)



Problem statement

As mentioned above, Churchill Borough features well-established neighborhoods, natural landscapes, and proximity to regional infrastructure. Despite this it faces challenges in effectively communicating and promoting its public assets to residents and visitors. Information about public assets, such as parks, local businesses and facilities, is often fragmented, limited and difficult to access. As a result, many residents may be unaware of nearby resources, and visitors may find it difficult to explore the area.

This lack of centralized and user-friendly information also creates challenges for Borough staff and planners. They must manage and promote community assets without a comprehensive overview of what is available within and around Churchill. Additionally, without clear visibility into existing amenities, there is a risk of underutilization of current resources and potential duplication of services in future planning efforts. This reduces the long-term sustainability and efficiency of community investments. Overall, the absence of an accessible system for identifying and exploring public assets limits the Borough's ability to fully use its resources. An improved system would support informed decision-making and use public resources more effectively.

Project Goal and Objectives

Through conversations with Council Member (and project host) Matt Castiglia, we were able to assess challenges facing Churchill Borough, including wanting to attract more economic development and lacking cohesive, accessible public assets. We aim to approach this challenge by exploring and developing an interactive digital asset map. This would enable residents, visitors, and municipal staff to identify and utilize public assets within the Borough and its surrounding areas with greater effectiveness. The goal of this project is to improve and centralize access to information on public assets. This would enhance public awareness, support community engagement, and contribute to more informed municipal planning. Additionally, this project aims to reduce the risk of unnecessary duplication of public assets and encourage collaboration with neighboring communities.

The project focuses on the following key objectives:

- **Identify and document community assets:** develop a structured overview of public assets within Churchill Borough, including parks, businesses, landmarks, and community amenities.
- **Analyze best case practices in asset mapping:** review existing digital asset mapping initiatives to understand effective design, implementation, and maintenance strategies.
- **Develop a preliminary digital asset map:** create an interactive GIS-based map that demonstrates how community assets can be organized, categorized, and accessed through filterable layers.
- **Assess implementation feasibility:** evaluate which components of digital asset mapping can be implemented in the short term and which may require longer-term development.

Best Case Practices

Hyperlocal digital platforms have been emerging in recent years. Hujanen et al. (2021) describes how "the affordances of Internet and digital technologies enable hyperlocal initiatives to enhance civic engagement in localities and serve as a resource for local deliberative processes." What distinguishes these platforms from broader digital media is the local, spatial focus. They have the capacity to offer a "geo-social" sense of place, anchoring residents to their specific community rather than a generalised information environment such as Google Maps(Hess and Waller, 2014). The digital revolution and platform economy is being hyperlocalized. This has implications for Churchill Borough.

Hujanen et al. identify three distinct civic roles that these hyperlocal platforms can take: information provider, community builder, and civic mediator. These roles represent a developmental progression and a measure of community sustainability and resilience. From distributing content, to facilitating participation, to enabling connection. This provides a theoretical framework for understanding the current state of the two platforms that this report will analyze.

Penn Hills Passport

Penn Hills Passport, a free mobile application launched in 2024, aggregates local news, events, businesses and public assets into a single place. Its motivation, as described by its creator, was straightforward: residents *"just don't know how much we have"*. In Hujanen et al.'s terms, this is the information provider role. It centralizes practical and service-oriented content that helps residents navigate their own community. Certain features like "Lost Pets" offer links to facebook discussions. This enables a limited interaction between users.

This role carries civic value. Residents who do not know what their community offers, what is happening in it, or what resources are available to them are less inclined to participate in it. Such a platform also stimulates a more efficient use of public resources by avoiding duplication. As hyperlocal communities face increasing budget constraints (CBO, 2010), resources should

be used as efficiently as possible. Therefore it is important to know what neighboring communities offer in terms of public resources and assets. A high percentage of private vehicle ownership and quality public transit enables residents to travel to other communities with ease.

The information provider role is however primarily one-directional. It currently has limited to no features that stimulate interaction between residents. Penn Hills Passport also lacks a mechanism for residents to provide input on specific locations. Local organizations and businesses are also unable to add information. This presents a significant barrier for community knowledge on the app.

Find It Cambridge

Find It Cambridge, developed by the City of Cambridge and serving approximately half the city's population, more closely approaches the community builder role. Unlike Penn Hills Passport, it is not only a directory but a participatory platform. Almost 500 local organizations, ranging from city departments to community groups and schools, post their own content on the platform (Ash Center, 2024). This creates network effects: the more organizations participate, the more valuable the platform becomes to residents, and vice versa.

Hujanen et al. describe the community builder role as one that strengthens the community by encouraging interaction between residents and local organizations. This process also creates a more active social space in the community. Find It Cambridge achieves this by lowering the barrier to participation for both providers and residents. Its multilingual design further addresses what Hujanen et al. identify as a persistent challenge for hyperlocal platforms: the tendency to serve already-engaged populations while underserving linguistic and cultural minorities. This may however be less of an issue for smaller communities like Churchill. By enabling organizations to manage their own presence, Find It Cambridge shifts from providing information about the community to facilitating participation within it.

Literature Review

Neither platform reaches Hujanen et al.'s third role, the civic mediator. This role does not only inform or connect but actively facilitates interaction between residents and local institutions. This would entail features that create channels for residents to report, give feedback and respond.

Hujanen et al. observe a gap between the ambitions of hyperlocal platforms and the interactivity in practice. Penn Hills Passport and Find It Cambridge conform to this pattern. They are more advanced than the fragmented status quo they replace, but they have not yet become the interactive digital platform that the civic mediator role describes. These measures aim to improve the social resilience of a community.

Table 1: Application comparison

	Penn Hills Passport	Find It Cambridge
Benefits		

	Fills a gap in the market	Good layout and visuals, User friendly
	Hyperlocal features such as “Lost pets”	External organisations are able to provide content. Platform features.
	Encourages development of lightweight scaling method	Multiple languages
Limitations		
	No search function	Only a webpage
	Limited information on public assets (parking, parks)	No features that enable interaction between residents
	Limited scale	Limited scale
	External organisations are unable to provide content	No map or ability to navigate neighborhood
	No features that enable interaction between residents	

If the expansion of Penn Hills Passport is not feasible for Churchill borough, it could choose to develop its own platform. In doing so, both Penn Hills and Find It Cambridge can provide best case practices. The recommendation would also be to start adding features that give the platform the role of a civic mediator immediately. The benefits and limitations from both applications can be seen in the table above.

Both expansion of Penn Hills and new application development would meet multiple client goals. These strategies would both enable Churchill Borough to identify and document public assets. A Churchill specific app would give the Borough more freedom to pursue its own interests while Penn Hills expansion would allow for more networking features and opportunities. In terms of implementation and long term funding, the strategies differ significantly. Implementation of a new app would be fairly limited as it does not aim to expand outside of Churchill. The future of the Penn Hills Passport application would depend on the nature of the collaboration with the Borough. Identifying funding sources for a new application could be difficult and limited. There is a possibility that potential funders would not see the benefit of the project since an existing application exists in a neighboring borough. The scale of both apps would be limited. Both apps would also compete for the same funding sources. This could create duplication and wasteful spending. However, this does not take away the usefulness of a hyperlocal application. It could pose large potential benefits to residents and the Borough leadership.

Methodology

This section outlines the approach used to develop the digital asset mapping project for Churchill Borough. It describes the methods of stakeholder engagement, data collection, asset

categorization, and case study analysis that informed the development of the final recommendations.

Stakeholder Engagement

This project was conducted in close collaboration with Churchill Borough, with regular input from a Churchill Borough Council Member. Weekly check-ins were held with Matthew Castiglia, complemented by two on-site visits to better understand the local context and verify asset information. These interactions played a key role in shaping the direction of the project. The feedback informed decisions such as the inclusion of surrounding municipalities and provided practical insights into local priorities, opportunities for inter-municipal collaboration, and the usability of potential digital solutions.

Council Member Castiglia discussed with us sustainability needs of economic development and community resilience. Churchill, like many cities and boroughs within the Rust Belt, faced a lot of decline when the Westinghouse facilities had closed. Castiglia had mentioned hoping that the facility would be taken over by a developer to boost the local economy and bring more people in. Further, he felt that continued connections with other boroughs would help create community resilience when it came to sharing public assets and resources.

Sustainable Case Study Analysis

To inform the development of the digital asset mapping approach, the project included an analysis of existing tools and platforms with similar objectives. Due to the relatively emerging nature of local asset mapping applications, only a limited number of comparable examples were identified.

Two primary case studies were selected:

- The Penn Hills mobile application
- The “Find It Cambridge” platform

These cases were analyzed through direct use and observation. The focus was placed on aspects that were informed by the theoretical framework developed by Hujanen et al. (2021). Insights from these examples were used to identify best case practices and potential design strategies applicable to Churchill Borough.

Data Collection

Community assets were identified through a manual data collection process, primarily using publicly available sources such as Google Maps. Each asset was individually reviewed and recorded in a structured dataset using Excel.

For each identified asset, key information was compiled, including:

- Name and category of asset
- Address and geographic coordinates
- A short descriptive note about the asset

This structured approach ensured that the data could be easily integrated into a Geographic Information System (GIS) for further analysis and visualization. Following stakeholder feedback, the scope of the dataset was expanded beyond Churchill Borough to include nearby municipalities, specifically Forest Hills and Wilkins Township.

Asset categories were defined to create a clear and user-friendly structure for the digital map. These categories were designed to reflect both municipal and user perspectives, grouping assets into recognizable and relevant types such as government, public safety, parks, education, businesses, and landmarks. This categorization supports the development of filterable map layers and allows users to easily navigate and explore different types of community resources. These were finalized to be similar to the categories found in the Penn Hills Passport application.

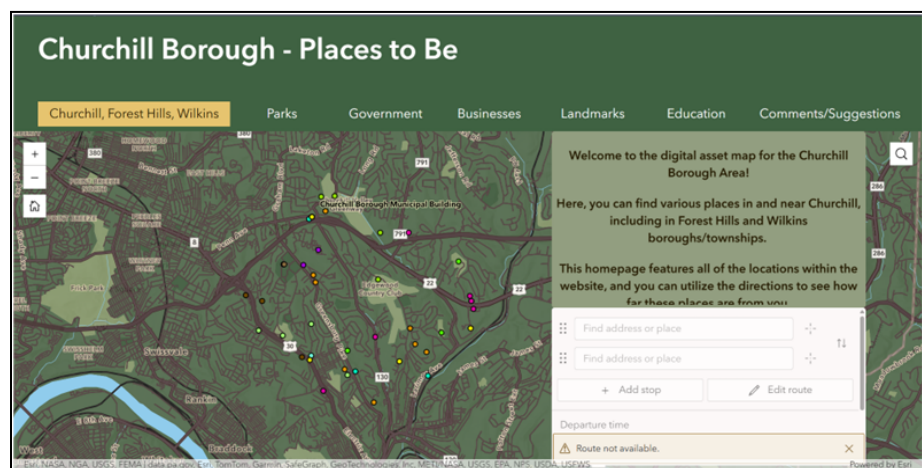
Asset Mapping

In order to provide an insight into how Churchill (and surrounding boroughs) can map and project public asset data. By looking at Google Maps data, and from our conversation with Matt Castiglia, we manually imputed name, address, and longitude/latitude data into Excel sheets, which were then converted into CSV files for better readability in ArcGIS Pro. CSV files were added into the ArcGIS project, and CSV data was converted into 'point' data where the sites were populated into the map. Sites were divided by borough, which were then divided by asset type through conducted data queries within the platform to provide better filtering in the final web-based, interactive map output.

In ArcGis Online, we created a 'basemap' (the background layer of the map) that matched the colors of the Churchill logo to create a feeling of cohesiveness. Then, we searched for a variety of "Experience Builder" (an ArcGIS online tool that allows users to create interactive websites that both display map and dataset information) templates. After investigating and committing to trial and error, we selected a template that we felt best suited the needs and recommendations we have for the borough.

From this mapping, we created a web application (explained later in the report). It is set to be able to be copied and published by the Churchill borough, and the dataset and maps will be shared with the borough for future management and implementation.

Further, datasets and maps will be shared through a project package file and digital sharing of



ArcGIS Online maps. The current live webpage can be accessed through this link: <https://experience.arcgis.com/experience/cc07577253224e8db766a78e82a3383d/>.

Initial Step: Web Application

The site has several main options: a landing page that allows users to select points of interest on the map, learn about them, and easily place them into directions; a tab for each filtered map, with dropdowns for each borough; a survey page where users can input comments or suggestions for locations to include. In addition, photographs are integrated throughout the site to show users what locations look like.

We included the survey option, understanding the importance of community built maps and input from Hujanen et al. but also considering the time constraint. This is not as seamless of a process of having nonprofits also integrated into the network or as personable as directly interacting with residents, it provides the space and capacity for the Borough to collect the information.

Utilizing the web page can contribute to the economic and social resilience of Churchill borough and surrounding areas. Identifying local businesses would encourage current and potential residents to explore and support the local economy. Further, there is future potential for businesses to post events they are hosting so that the greater community can easily see and know what is happening. In regards to social resilience, the web app serves two main functions.

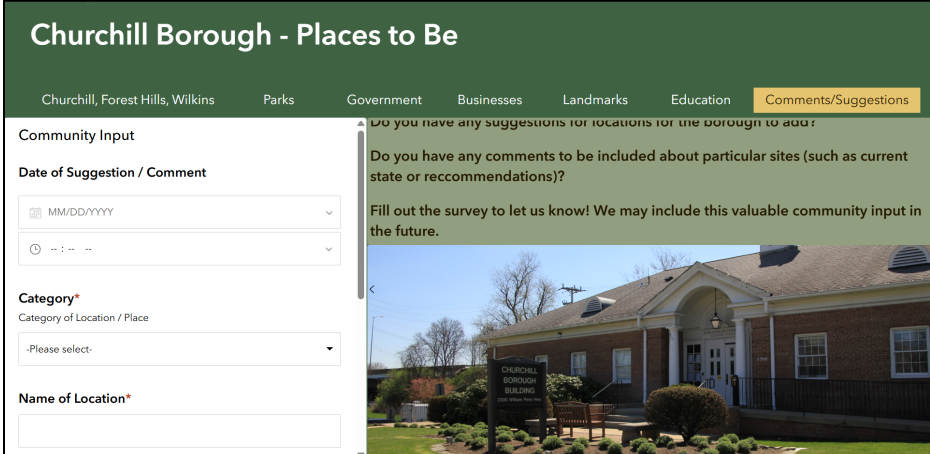
1) Residents are able to view places to meet together and get involved. Whether it is finding a new park or utilizing

the community space in the borough office, residents can be more inclined to participate in civic events. 2)

Residents can interact with the survey and have input in the public assets of the communities.

A web application is also able to keep a

level of accessibility for residents. While apps such as the Penn Hills Passport are extremely useful and innovative, some residents, particularly elderly residents, may find apps difficult to use or feel frustrated with the amount of apps they need to use already. Having the web application as a continuing option allows for users to have a choice in how they access this information and would allow for better accessibility for those who are elderly, have limited phone data, or overall prefer web pages as opposed to apps on smartphones.

The screenshot shows a web application titled "Churchill Borough - Places to Be". It features a navigation bar with tabs for "Churchill, Forest Hills, Wilkins", "Parks", "Government", "Businesses", "Landmarks", "Education", and "Comments/Suggestions". The "Comments/Suggestions" tab is active. Below the navigation bar, there is a "Community Input" section with a "Date of Suggestion / Comment" field (MM/DD/YYYY) and a "Category" dropdown menu. The "Name of Location" field is also visible. To the right of the input fields, there is a text area for comments and a button to "Fill out the survey". Below the input fields, there is a photograph of the Churchill Borough Building.

Scope and Limitations

The scope of the project was largely impacted by timeframe and available data. As a result, the digital asset map represents a preliminary step in the implementation process rather than a fully developed platform. While significant progress was made in identifying assets, developing a structured dataset within ArcGIS Pro, and creation of a preliminary interactive web-based platform, further work would be required to expand coverage and refine features.

Further, the development of a fully functional standalone application was not considered feasible within the scope and duration of this project. The use of the GIS web page provided a practical and effective alternative for demonstrating the potential of digital asset mapping. This approach allows for flexibility, scalability, and ease of future development.

A key consideration identified during the project is the importance of scale. Developing a platform solely for Churchill Borough may not be sustainable in the long term due to its relatively small size and limited number of assets. Expanding the scope to include neighboring municipalities can significantly enhance the usefulness of the platform by increasing the amount and diversity of available data. A larger, collaborative system would provide greater value to both residents and visitors, while also improving long-term viability.

Despite these limitations, the project provides a strong foundation for future development and offers recommendations that can support better informed decision-making by Borough representatives.

Conclusion

In order for Churchill Borough to become more socially resilient and economically sustainable, in regards to public assets, they should adopt a centralized, local digital map via an app and/or web page. Even with some limited public assets, residents and visitors lack a centralised way to discover and engage with them. Ultimately, this leads to underutilization of public assets, less civic participation, and a risk of planning duplication between other local boroughs. Digital asset mapping offers a practical and scalable response to this challenge.

Hujanen et al. provides a lens through which two hyperlocal digital asset mapping programs were analysed. It showed that effective platforms can function as information providers, community builders, and civic mediators. Penn Hills Passport demonstrates that a lightweight and low cost solution can fill this information gap. Find It Cambridge shows that platforms become more valuable when local organizations are able to contribute their own content. This creates network effects that increase its importance to the whole community. It also shows the importance of a good user interface. Neither platform has achieved what Hujanen calls the civic mediator role. Future projects should aspire to go into this direction by implementing the right features.

The preliminary GIS map and structured asset dataset developed through this project provide a starting point. They demonstrate that the concept is feasible. It also shows that a regional approach including neighboring communities could improve the long term viability of the project.

Churchill's challenge is not unique. Across the United States, small municipalities are navigating the same tension between limited resources and growing resident expectations for accessible and digitally delivered public information. This project illustrates how a community can begin to address that challenge. Digital asset mapping has the potential to become a shared regional investment. The main challenge here is to balance scale with hyperlocal relevance.

The following steps should include building the local will to pursue regional collaboration, and making this case to residents, neighbouring councils, and potential funders. This is a good example of a situation where the whole is greater than the sum of its parts. An integrated regional platform is greater than multiple local ones. The hope is that this project provides the means to start that conversation.

Final recommendations

Based on the findings of this project, several key recommendations are proposed to support the continued development and long-term success of digital asset mapping in Churchill Borough.

1. Collaboration

1.1 Churchill should create a regional applicationA primary recommendation is to collaborate with neighboring municipalities, such as Wilkins and Forest Hills townships. Given the relatively small size of Churchill Borough, a standalone platform may lack sufficient content to remain engaging and useful over time. A regional approach would increase the number and diversity of available assets. It would also support regional economic development, and achieve Churchill's goals of increasing the amount of public assets that people are able to easily access. Ultimately, it would make the platform more valuable to both residents, visitors and local organizations. In regards to planning, it also supports long-term sustainability as it reduces duplication of resources, especially as the asset list grows over time. It opens shared ownership of the web application and/or app as a public resource between multiple boroughs. In this context, Churchill Borough could act as a test case for gradually expanding a shared platform by adding new communities in a lightweight and scalable manner.

1.2 Churchill should integrate with existing mapping systems

Rather than developing a new application from scratch, Churchill Borough should explore collaboration with existing tools such as the Penn Hills mobile application, which is also an adjacent municipality. This platform addresses a clear gap in hyperlocal asset mapping and could serve as a foundation for expansion into new communities. By contributing to and helping expand an existing system, Churchill can benefit from established infrastructure while maintaining local input and potentially increasing its ownership and influence over future development. At the same time, it is valuable to draw inspiration from more advanced platforms such as Find It Cambridge. This platform offers lessons on the importance of detailed information, user interface, and integration with the local institutions. Combining the strengths of both approaches can support a more robust and user-friendly solution. This would enable the application to aspire to its modal role as civic mediator.

Either of these options, or a combination of the two, are viable steps that the borough can begin given the resources provided through this project. This recommendation at any stage would require continuous, open collaboration between the local boroughs to be consistent in order to optimize success.

2. Churchill should embrace community input

While expanding the platform to include multiple municipalities is beneficial, it is important to maintain a sense of local relevance. Features that are highly valued at the local level, such as community alerts or lost pet notifications, may be more difficult to scale effectively as Churchill involves more boroughs in the collaboration process. While the application gains large benefits with scaling outwards, it can lose its local focus. Churchill Borough, alongside collaborators, should therefore aim to strike a balance between regional expansion and localized functionality. This could involve structuring the platform in a way that allows users to filter by municipality while still benefiting from a broader network of assets. This way, residents on the platform can make suggestions and post events that can be local to their specific municipalities. This helps increase social resilience and feeling of connection, encouraging residents to participate in more local events and activities.

Managing the content will be essential for long-term success. A platform with limited content, such as a lack of events, may appear underdeveloped and discourage user engagement. To address this, the Borough could explore solutions such as automated activity or event scraping, as well as opportunities for community or organizational input to continuously expand and update available information.

Next Steps

As a next step, the deliverables of this project, including the preliminary GIS map, the structured dataset of public assets, and the comparative analysis of existing asset mapping platforms, should be treated as a starting point for future implementation. Rather than beginning from scratch, Churchill Borough can build on the work completed through this project to accelerate future development and reduce costs.

The GIS map and asset inventory provide an initial database and web application that can be further refined, expanded, and integrated into a final product. The current project functions as a proof of concept that demonstrates both feasibility and potential value. It can serve as a start to collaboration between Churchill and other boroughs. This could involve developing a dedicated local tool or utilizing already existing applications such as the Penn Hills Passport.

Churchill Borough representatives can use the findings of this project to engage local stakeholders and residents by showing that this project also supports collaboration with neighboring municipalities. An improved platform would also give benefits to local businesses who could post their own events. Presenting this recommendation through an external academic perspective may help build local confidence and show that regional cooperation is an option worth exploring. This is important because a multi-borough platform would likely be more sustainable and attractive for future funding opportunities. Building early community support for

regional collaboration could therefore play an important role in turning this project into a long-term success.

A further opportunity would be to continue development through future student involvement at Carnegie Mellon University. There was a lack of grants eligible to the borough for this type of app development, as many community development grants require investment in physical assets (such as land acquisition) or population minimums. The next phase of the project could be best advanced through a future iteration of this course or developed as a capstone project, allowing students to build on the current foundation by refining the platform and developing the application itself without requiring outside funding from the state or other nonprofit.

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