Enhancing the Visibility of the Maria Mitchell Association

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Abstract

The Nantucket Maria Mitchell Association (MMA) is a science organization with multiple sites dispersed around the island. Visitors have difficulty navigating between sites and understanding how the sites relate to the MMA's mission. The goal of this project was to determine steps the MMA could take to improve visitor wayfinding and clarify its identity. Our team identified and evaluated wayfinding and identification strategies used by the MMA and other organizations. Through our own observations on the island and interviews with various stakeholders, we identified areas for improvement. We developed recommendations for the MMA's branding, marketing strategies, signage, and online presence to promote a consistent identity for the MMA and improve visitor wayfinding.

Acknowledgements

Executive Summary

Nantucket presents many challenges when it comes to improving wayfinding and organizational identity. Historic preservation is regulated by the town and Historic District Commission (HDC), and affects the appearance of buildings and the usage of signage. These restrictions limit the potential wayfinding and branding strategies an organization on Nantucket can use. Wayfinding and branding become even more important for an organization that has a dispersed campus so visitors can make their way between the locations and recognize each belongs to the same location. The Nantucket Maria Mitchell Association (MMA) currently struggles with wayfinding and identity, utilizing inconsistent logos and signage.

Project Goals and Objectives

Our overall project goal was to determine steps the Maria Mitchell Association could take to improve visitor wayfinding and promote its organizational identity. In order to achieve this goal, we pursued four objectives:

- **Objective 1:** Identify wayfinding and identification strategies used by other institutions.
- **Objective 2:** Determine the perspectives of key stakeholders regarding the wayfinding and identification challenges the MMA faces, identify previous efforts to address the challenges, assess current signage and marketing materials, and evaluate potential solutions.
- **Objective 3:** Examine budget, design, and regulatory constraints as well as wayfinding and identification approaches others have used on the island.
- **Objective 4:** Propose a set of recommendations that includes materials and designs the MMA can implement to improve visitor wayfinding and identification.

Research Methods

In order to learn more about the nature of the wayfinding, identity, and identification challenges faced by the MMA, we contacted key stakeholders on the island. Because these stakeholders focus on different parts of the MMA's wayfinding, identity and identification challenges, we conducted specifically tailored interviews for each stakeholder. We conducted interviews with representatives of the following stakeholder groups:

- MMA board members, staff members, and interns;
- The Nantucket Historical Association;
- ReMain Nantucket;
- Egan Maritime Institute;
- The Office of Culture and Tourism;
- The Sign Advisory Committee of the Historic District Commission;
- Architects on Nantucket; and
- Others, including local businesses, involved in identification and wayfinding on Nantucket.

Additionally, we gathered feedback from MMA board members, staff, and supporters using a Google Forms survey. MMA staff selected a sample of 119 MMA staff, board members, members, and active supporters. Out of the 119, we received 24 responses. We used this survey to generate data on visitation trends, wayfinding preferences, and wayfinding concerns at the MMA. We also wanted to gauge whether QR codes and typing a web address into a phone would be practical means of informing visitors.

In order to preserve the historic nature of the island, the Historic District Commission (HDC) has created a list of regulations that we reviewed and took into account when choosing which options would be suitable for Nantucket's historic atmosphere, including regulations for signage, landscaping, hardscaping, and lighting. We compiled a list of the relevant regulations and other restrictions into a comprehensive list of limiting factors. This list of limitations served as a checklist of the standards each possible solution needs to meet to be considered viable. Some of the most relevant were the signage and architecture guidelines.

In order to propose a plan of action for the MMA, we asked what staff members wanted, what the board of directors would consider when presented with a recommendation, and what solutions are feasible for the organization. We also considered limitations like number of signs at locations, costs of our proposed solutions, and how the MMA may fund any of our recommendations. We held an exit meeting with the MMA staff to present our final recommendations. We aimed to make our proposed solutions as cost-effective as possible when compared to the increase in visitation they achieve.

Findings and Discussion

The following section includes findings about the use of different logos by the MMA, signage that should be improved, landscaping options, and the MMA's online presence.

Logo and Marketing Collateral

The MMA lacks a clear identity and the use of two logos causes furthers confusion. Additionally, inconsistencies in the use of each logo makes the organization seem unorganized and less professional. The MMA's logo usage guidelines are outdated and often ignored, leading to a lot of variation in marketing collateral. Currently, the only overarching marketing collateral for the MMA is a 30 page programs book, which day trip visitors are unlikely to read in its entirety.

Signage

The signs on MMA facilities are in various conditions from pristine to barely readable. There are other types of signs the MMA could consider using like rock signage and post signs to improve the signage at Loines Observatory. Notice boards used by the MMA have unorganized paper flyers, some of which are outdated, have no map, and appear unkempt.

Landscaping

The landscaping varies between the MMA properties, which can cause a lack of visual unity. Indigenous plants are maintained for their ecological significance, but often make the properties look unkempt. Benches and picnic tables can be used to make a property appear less residential and more inviting.

Online Presence

The MMA's presence on various social media sites has been developing in the past years, but still has the opportunity to improve. Additionally, the MMA's website uses an outdated format, created between 2012 and 2013, that is difficult to navigate, is not mobile-friendly, and does not meet the expectations of a contemporary website. The MMA has three different pages on TripAdvisor: one for the Aquarium, one for Loines Observatory, and one for the MMA as a whole. Currently, MMA staff do not respond to all TripAdvisor reviews.

Conclusions and Recommendations

From our findings, we conclude that there is significant confusion surrounding the MMA's identity, which has been a source of many of its problems. With this in mind, we recommend the MMA determine how it wants to identify itself and solidify its brand around one identity. More specifically, we suggest the MMA consider improving: branding; marketing collateral; signage; landscaping; online presence; its maps; and its organizational image. The conclusions and recommendations for each of those specific topics are as follows:

Branding

The use of multiple logos causes confusion. We *highly* recommend the MMA *choose one logo* and *eliminate the usage of all other logos* in its signs, marketing materials, and other belongings. This implies a lengthy process, and will be a long-term goal for the MMA which may entail creating an entirely new logo.

Marketing Collateral

The MMA has a variety of marketing material with inconsistent formats. We recommend the MMA develop an overarching brochure that targets daytrip visitors to Nantucket, and that it place these brochures at locations the majority of visitors must pass by on their trip to Nantucket, such as the ferry terminals. Developing and enforcing a set of guidelines for marketing materials will ensure consistent formatting.

Signage

Some of the signs are in poor condition and should be replaced. When these signs are replaced, we recommend they be consistent with the one logo the MMA has chosen as its visual representation. Additionally, we suggest the MMA create signage closer to the street at Loines Observatory.

Landscaping

Many of the MMA properties appear unkempt, and landscaping varies between facilities. We recommend the MMA maintain a crisp and clean appearance by ensuring the vegetation is cut back and repainting the trim of the buildings. To create a visual unity on the MMA campus, we recommend the organization use benches, picnic tables, uniform fencing, and consistent plantings at each location.

Online Presence

The MMA's online presence has increased over the years but can be improved. We recommend the MMA continue to improve its social media pages using the set of guidelines we have created. Specifically, we suggest the MMA respond to all TripAdvisor reviews in a timely manner. The MMA's website currently uses an outdated framework and lacks plugins that could make the website mobile-friendly and improve ease of use.

Maps

The MMA has a very simple digital and paper map. We recommend the MMA adopt and maintain an updated version of the Google My Map we created. To increase visitation to Vestal Street, we suggest the MMA consider using a walking tour map that guides visitors to Vestal Street while educating them about Maria Mitchell's life.

Organizational Image

Staff have numerous time-consuming responsibilities, which causes a lack of communication between the departments. This lack of communication is detrimental to the organization. We recommend the MMA work to unify its departments and increase the levels of communication and cooperation between them by following all guidelines created for the organization.

Although there are a variety of wayfinding and organizational identity challenges to address, we hope the recommendations in this report will help the MMA clarify its identity and improve visitor wayfinding.

Authorship

The primary authors are listed. The editing process involved all group members reading through the document and making suggestions, which were then discussed as a team.

Section/Chapter	Author
Title Page	(All)
Abstract	(All)
Acknowledgements	(All)
Executive Summary	(All)
Authorship	(All)
1. Introduction	(All)
2. Literature Review	EB, PM
2.1 Overview of the Maria Mitchell Association	EB
2.2 Wayfinding	PM
Definition of Wayfinding	PM
Signage	DC, CO
Orientation	DC, PM
Architectural Wayfinding	EB, CO
Wayfinding Technologies	EB, PM
2.3 Organizational Identity and Identification	EB
Marketing in Museums	CO
Social Media in Businesses	ED, CO
Museum Branding	DC, CO
2.4 Wayfinding and Identity Challenges at the MMA	DC, PM
3. Research Methods	PM
3.1 Identifying Wayfinding and Identification Strategies	DC, PM, CO
3.2 Determining the Perspectives of Key Stakeholders	EB
Interviews	(All)
Member Survey	EB, PM
3.3 Evaluating Constraints	PM
Legal Requirements and Restraints	PM
Budgeting Possible Solutions	PM
3.4 Proposing a Plan	EB, PM, CO
4. Findings and Discussion	EB, DC
4.1 MMA Brand and Two Logos	PM
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1. Introduction

Wayfinding and branding are important for the success of organizations that have buildings spread out across multiple locations. Navigating among seemingly disconnected buildings can prove to be difficult, but effective wayfinding and branding strategies can alleviate this difficulty. Many different organizations such as museums, universities, and historical preservation sites struggle with wayfinding and organizational identity. Each organization uses a variety of approaches, typically involving signage, maps, architectural designs, landscaping, and increasingly, technology. The Nantucket Maria Mitchell Association (MMA) is an organization struggling with wayfinding and identity. Ideally, visitors on Nantucket would be able to easily recognize the MMA's purpose and locate all of its buildings easily, but the layout of the museum campus and current wayfinding and branding strategies do not sufficiently assist visitors.

Wayfinding and branding are broad subjects that include many techniques to help create a positive visitor experience. Proper signage is an essential part of any effective wayfinding scheme. Studies at college campuses have shown that consistent signage improved wayfinding and organizational identity. Orientation, both spatial and conceptual, has been successfully implemented in museums to improve visitor wayfinding. Architectural wayfinding (i.e., using architectural elements as wayfinding cues) has also proven to be a successful technique in historical villages. Additionally, many technologies are being developed to improve pedestrian wayfinding including mobile applications (apps), Quick Response (QR) codes, audio tours, and augmented reality. Although there are many strategies the MMA might use to improve wayfinding and identification, restrictions such as historical regulations, sub-optimal building locations, and budget constraints limit the available options. The MMA currently employs two different visual identities: (1) one on signs and (2) the other predominantly online and on printed materials) which can cause further confusion for MMA visitors.

Our overall project goal was to determine steps the Maria Mitchell Association could take to improve visitor wayfinding and promote its organizational identity. In order to achieve this goal, we pursued four objectives:
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We conducted interviews with representatives of key stakeholder groups and surveyed a selection of MMA staff, board members, and supporters. Our interviews sought to answer a few key research questions: how the MMA perceives itself and how it hopes to be perceived on Nantucket; what successful and unsuccessful wayfinding and identification strategies have been

employed on island; and what regulatory limitations exist on wayfinding including signage, landscaping, hardscaping, and architectural features. The survey we conducted gave us data on visitor perspectives, visit trends, preferred methods of navigation, likelihood to scan QR codes, and probability of typing in a website address. After analyzing our data and discussing possible solutions with MMA staff and board members, we presented a list of suggestions for possible changes to improve the MMA's wayfinding and identification, taking into consideration factors such as effectiveness, ease of implementation, and budget.

2. Literature Review

Wayfinding, identity, and identification have many different aspects that affect visitor experience. In order to address the Maria Mitchell Association's wayfinding, identity, and identification concerns, we review the current and best practices. We begin our discussion of this review with an overview of the MMA followed by a definition of wayfinding and look at an assortment of wayfinding aids. Then we discuss how organizations create and promote an identity through marketing, branding, and social media in order to keep themselves easily identifiable by the public. We end this chapter with a summary of the MMA's wayfinding and identification challenges.

2.1 Overview of the Maria Mitchell Association

The Maria Mitchell Association (MMA) was created in 1902 to preserve the legacy of Maria Mitchell, America's first female astronomer[1], by continuing her philosophy of "learning by doing" through research projects and programs provided to visitors. The MMA describes its mission as the "promotion of the legacy of Maria Mitchell and exploration, education and enjoyment of Nantucket's land, waters and skies beyond" (mariamitchell.org). The campus consists of the Loines Observatory, Vestal Street Observatory, Natural Science Museum, Aquarium, Historic Mitchell House, an Administration Building, the Washington St Facility, and the Research Center (Figure 1). The MMA is regarded as a "science organization" that conducts astronomical research and provides interactive exhibits and guided nature walks, but it also maintains Mitchell's historic birthplace. The multi-faceted mission of the MMA causes some confusion among visitors, and the nature of the MMA campus confounds the problems of organizational identity, building identification, and wayfinding. As shown in Figure 1, the Loines Observatory on Milk Street Extension and the Washington Street Facility and Aquarium on Washington Street are significant distances away from the cluster on Vestal Street. In the case of Loines Observatory, people visit at night but the location sign is far away from the street and is unlit to avoid interfering with observations of the night sky. As a result, visitors miss the sign and often drive by (Jascin Finger, personal communication, September 12, 2017). The only lights at the Loines Observatory are small red guide lights on the stairs to help visitors find their way to the door while maximizing the visibility of the stars. Additionally, the MMA properties on Vestal Street (Figure 2) look like private homes and are hard to distinguish from the residential houses surrounding them. The MMA buildings on Vestal Street include the Historic Maria Mitchell House; the Research Center (which was the former Research Library); the Vestal Street Observatory; Hinchman House, which holds the Natural Science Museum; and the Administration Building at Drake Cottage.

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[1] Maria Mitchell was born in 1818 on Nantucket and was America's first professional female astronomer. She is well known for discovering a comet in 1847, but she was also The Nantucket Atheneum's first librarian, a naturalist, and an educator. Mitchell inspired many of her students and had a strong belief in "learning by doing" (mariamitchell.org).

Figure 1: MMA's printable map, supplied on its website (mariamitchell.org), with added photographs of each of the buildings

Figure 2: Aerial view of Vestal Street properties

MMA staff report that visitors have difficulties navigating from one MMA site to another, and find the connection between the buildings themselves and the MMA's mission to be unclear. For example, visitors may go to the Aquarium, but not go to any of the other buildings because they do not know the buildings exist, where the buildings are, or how to get to them (J. Finger, personal communication, September 12, 2017). Since visitors cannot easily distinguish among the MMA buildings by their physical features, the MMA must rely on other wayfinding strategies to help visitors navigate to and identify its locations.

2.2 Wayfinding

To understand the challenges the MMA is currently facing, we review the different categories of wayfinding tools and discuss the various wayfinding methods used by other institutions. Then we examine the effects signage, orientation, architecture, and electronic technologies have had on other institutions.

Definition of Wayfinding

Wayfinding is the process of navigating between locations. There are many different techniques and tools intended to make wayfinding in unfamiliar locations easier; however, choosing the optimal mix for a given situation can be difficult. There is a wide variation in the types of places that suffer from wayfinding challenges. Without proper wayfinding design, people may perceive an unfamiliar place to be an ugly and chaotic mess (Gibson, 2009). Passini (1996) defined wayfinding as "three interrelated processes: 1) decision making and the development of decision plans also called action plans; 2) decision execution, transforming decision plans into behaviour at the right time and place along a route; and 3) information processing, comprising environmental perception and cognition which provide the person with the information necessary for the two decision related processes" (p. 322). Figure 3 illustrates the wayfinding process, which begins with observing one's surroundings in order to determine current location and necessary direction of travel. After the direction of travel is determined the individual must plan a route and execute that plan. When the plan is executed, the individual will either arrive at his or her destination or get lost, in which case he or she must begin again by observing his or her surroundings. Proper planning and the use of wayfinding tools can prevent people from getting lost and repeating the process again. It is important to consider how people will move from one location to another in order to ensure they are able to do so without difficulty. Passini (1996) argued that poor wayfinding leads visitors to feel negatively about a location and have less desire to return. According to Pati, Harvey, Willis, and Pati (2015), "[d]isparate studies have identified a few of the environmental attributes that influence navigation including visual configuration of space, signage, landmarks, architectural differentiation, and symmetry of layout" (p. 45). Merje (2014) describes five different facets of wayfinding: signage, pre-arrival technology, place technology, environment/spaces, and support information, each consisting of multiple elements (Table 1). *Signage* refers to markers used to guide people to locations and to provide valuable information about events, history, regulations, and more.
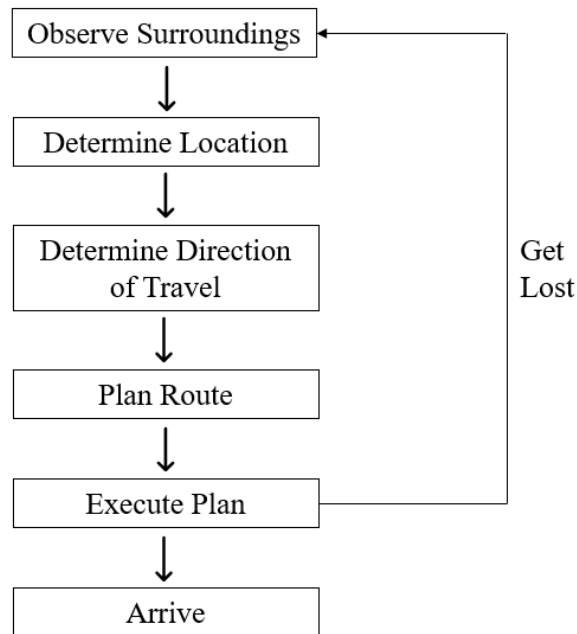
Figure 3: A wayfinding flowchart, also showing the process of getting lost
(Modified from Ishikawa, Fujiwara, Imai, and Okabe (2008))

Pre-arrival technology is material that provides people information prior to their arrival to the location and includes advertisements and websites encouraging people to visit a location and show them how to get there. *Place technology* refers to tools available upon arrival at a site, including structures that are part of the location, such as pedestrian kiosks, as well as mobile technologies, including GPS and mobile apps. The *environment and spaces* are physical features including landmarks, paths, and other noteworthy elements that help guide people to their destinations. *Support information* includes supplemental materials, such as brochures, maps, and guides that provide valuable navigational aids and also often provide interesting information about the area and its attractions. There are a variety of options within each of these five categories, but in order to have a successful wayfinding experience it is important to consider multiple categories and not just focus on one of them (McClead, 2014).

Table 1: A chart showing the many aspects of wayfinding
(Modified from Merje, 2014)

SIGNAGE	PRE-ARRIVAL TECHNOLOGY	PLACE TECHNOLOGY	ENVIRONMENT AND SPACES	SUPPORT INFORMATION
Interpretive	Google Maps	Mobile Apps	Landscape/Hardscape	Bus Shelters
Banners	City Website	GPS Devices	Paths and Nodes	Brochures
Pedestrian Signs	Tourism Website	Pedestrian Kiosks	Landmarks	Visitor Guides
Vehicular Signs	Attractions Website	QR Codes	Waterfront	Maps
Parking	Parking Website	Bluetooth Beacons	Destinations	Street Elements

Signage

When signage is posted in an effective manner, it can "informationally and visually knit together a site, a collection of sites, such as regional parks or global corporate facilities; or networks, such as a transportation system" (Calori and Vanden-Eynden, 2015). Consistent signage creates an easily recognizable location or campus for a certain organization, and distinguishes it from its surroundings. Signage as a wayfinding strategy can be seen at the University of Washington and Seton Hill University.

Based on a 2006 study by the Department of Architecture at the University of Washington in conjunction with Studio Matthews, effective signage has the following qualities: hierarchical sizes of signs, organized coloring of signs, and a uniform look for all of the signs at a single establishment. The hierarchical size of signs assists visitors in recognizing the various parts of a campus. In an urban setting, this is particularly useful because it is often difficult to distinguish which buildings belong to the campus and which do not. Seton Hill University tackled this challenge by installing a new digital sign on the road near the entrance (Martin, 2006). They were able to broadcast information about events on campus as well as provide the feeling of arrival.

Both Seton Hill University and University of Washington used larger signs to mark where their campuses begin and have the function of welcoming visitors. They used smaller, local signs to direct visitors within a specific part of the campus. Directional posts, or "nudge" posts, direct visitors to specific places, such as a particular building, park, or sports complex. They used an organized coloring of signs to improve visitor wayfinding through signage as well. When an organization dedicates a unique color to the separate parts of its campus, visitors are able to navigate to their desired location by simply following the respective color. Overall, it is important for campus signs to have a uniform format, and without a uniform text font, sign appearance, and main color choice, signs would appear to belong to a variety of organizations, not just a single one (University of Washington, 2015). Martin (2006) also concluded that the idea of signage uniformity is important for college campuses and recommended to create a signage "family" with a hierarchy of when and where several types of signs should be implemented on campus to provide directions to visitors.

Orientation

Orientation in the context of wayfinding can take two forms: spatial and conceptual. Spatial orientation is a person's understanding of their location in their surroundings (Hayward and Brydon-Miller, 1984). In the context of a museum or other interpretive institutions, orientation can also be conceptual by introducing key themes that will help visitors get the most out of their visit (Hayward and Brydon-Miller, 1984). Many of the tools listed in Table 1, particularly in the signage, support information, environment and spaces, and space technology categories, can be used to assist in the spatial aspect of orientation. Conceptual orientation can be provided through "brochures, films, slide shows, maps, displays, and information desks staffed by museum personnel" (Hayward and Brydon-Miller, 1984). These methods of orientation

concur with the pre-arrival technologies Merje (2014) lists in the pre-arrival technology and support information categories of Table 1. These tools are typically used by an institution to increase visitor learning, and thus understanding the target audience is important when presenting the necessary information (Hayward and Brydon-Miller, 1984).

Museums can often confuse patrons due to their unfamiliar layout and surroundings. One museum that has experienced challenges with wayfinding and orientation is the Imperial War Museum (IWM) North located in Stretford, England. This museum is a unique case, as the architecture was almost intentionally designed to unsettle and evoke emotions from the guests (MacLeod, Dodd, and Duncan, 2015). The inspiration behind the architecture is partially taken from a globe shattered by war, thus the structure of the museum is split into three shards: earth, water, and air (MacLeod et al., 2015). The foyer is structured to represent a bunker filled with uneven walls and floor panels that disorient the visitors (MacLeod et al., 2015). A research study conducted based on visitor feedback revealed several challenges experienced when trying to navigate the IWM North. Some of these difficulties included being unable to find the entrance, feeling uncomfortable and disoriented by the bunker shaped foyer, and not knowing how to behave in the museum (MacLeod et al., 2015). Since large museums often sprawl over wide areas with multiple galleries, there are many possible routes for people to take, which can cause confusion. At the IWM North, visitors would often double back on themselves (MacLeod et al., 2015). While the architecture was a source of some of the confusion, this did not stop the team from developing a strategy to improve the visitor experience. First, the museum mapped out an ideal visitor experience. This exercise was useful in identifying a preferred visitor route through the museum (MacLeod et al., 2015). After identifying a path for the visitors, the next step was to utilize proper wayfinding tools to make it easier for the visitors to follow the prescribed path. One such step was to use the foyer as a place to orient the guests. The original course of action was essentially throwing the guests straight into the challenging atmosphere of the museum without any guidance (MacLeod et al., 2015). With this practice, it is no surprise guests "did not know how to behave" in such a confusing and interpretive museum. Utilizing the ideas of conceptual orientation brought up by Hayward and Byron-Miller (1984), the foyer serves as a space to prepare the visitors by giving them an understanding of the values and priorities of the museum (MacLeod et al., 2015). The recommended route through the museum was made more concrete utilizing proper "wayfinding materials," such that visitors would move through the water shard and then ascend into the tower of the air shard as a "grand finale" (MacLeod et al., 2015). The use of signage and brochures to advertise both the route through the museum and the existence of the three shards helped to satisfy the visitor's need for spatial orientation. With these steps, the IWM North staff found ways to orient guests both spatially and conceptually in the museum and improve the overall visitor experience.

In 1984, Hayward and Brydon-Miller surveyed visitors at Old Sturbridge Village to determine the usefulness of various orientation methods. Table 2 shows some of the results of their survey over the course of two years. Although this is an older study, the data collected is relevant in showing how useful each orientation method is for the different goals they

considered. The results suggest the vast majority of people found the brochure map useful for navigation around the village, with over 90% of visitors saying it was helpful. This percentage was significantly higher than that of the other orientation methods, with none of them being reported as useful by a majority of people. This means a portable map on a brochure can play an important role in a visitor's navigation process. In comparison with the brochure map, the standing display map was much less useful where less than 15% of people found it helpful. By the second year of the study an orientation video was deemed helpful by a majority of visitors for getting a sense of the time period and community and obtaining other factual information. As a collection of historic buildings, Old Sturbridge Village is similar to Nantucket in that both strive to maintain a historic identity. This limits the implementation of wayfinding tools, such as extensive signage, which would feel out of place in a historic setting (Orbaşlı and Shaw 2007)

Table 2: Old Sturbridge Village Orientation Data
(Modified from Hayward and Brydon-Miller, 1984).

Effectiveness of On-Site Orientation Experiences						
	No Changes				Changed Between Year 1 and Year 2	
	Standing Display Map		Map (brochure)		Film	
	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
1. Finding your way around the Village	13%	10%	93%	95%	19%	34%
2. Getting a sense of the time period	3%	7%	9%	13%	80%	86%
3. Getting a sense of the community	7%	12%	20%	36%	43%	64%
4. Obtaining other factual information	4%	6%	22%	26%	64%	66%

Architectural Wayfinding

Wayfinding strategies may also use physical features, such as plantings, sidewalks, and benches to orient visitors. Anous (2015) claims architectural wayfinding systems "use the design and organization of landscaping, urban amenities, and buildings as spatial indicators" (p. 19) that help visitors understand where the public is welcome, and where their access is restricted. Pati et al. (2015) say that landmarks and architectural features are particularly important in wayfinding to create a distinct environment. Architectural wayfinding features also improve the accessibility of these places to those that may have physical disabilities or other problems that may make

wayfinding a much more difficult task for them (University of Buffalo School of Architecture and Planning, 2001). Nantucket architect Mickey Rowland says architectural wayfinding "is important in any project, either residential or commercial, in that people should understand how to approach a building and how to make their way to the entrance," particularly when they have physical disabilities and need to find the entrances accessible to them (M. Rowland, personal communication, October 27, 2017). Effective architectural wayfinding, in turn, enhances guests' experiences by making their visits much less confusing. Below, we discuss two examples of architectural wayfinding: Plimoth Plantation in Plymouth, Massachusetts and historic buildings preserved by the U.S. National Park Service.

Plimoth Plantation is an example of a historical village in which wayfinding is supplemented by architectural wayfinding. Plimoth Plantation includes re-creations of a 1627 English Village, a Wampanoag Campsite, and the Mayflower II, which are widely separated across the approximately 100 acre site. The museum does not use a map to assist visitor wayfinding but relies heavily upon architectural wayfinding to guide guests. To preserve the feeling of the time period, concrete walkways, streets, and lighting are forbidden, making wayfinding between these locations confusing at times. Previously, Plimoth Plantation had no trails directly connecting the 1627 English Village and Wampanoag Campsite. Other trails were very uneven and difficult to traverse for some visitors. In 2011, Plimoth Plantation addressed this problem by constructing a woodland trail connecting the two sites. In addition to the path, educational signs were posted to inform the visitors of the land's history, such as the Eel River and Cape Cod Bay. This succeeded in informing visitors about the old settlement and identifying important aspects of its history that visitors otherwise may have missed. In addition to the small educational signs, wooden benches were constructed to aid those with a lack of physical capabilities in travelling the entire half-mile trail (Plimoth Plantation, 2011). The consideration of more direct pathways as well as educational and physical assistance in navigating these paths was a prominent strategy used by Plimoth Plantation to improve visitor wayfinding.

Architectural wayfinding and identity is also considered for buildings that are historically preserved by the U.S. National Park Service (NPS). The NPS issues guidelines for how to preserve the architectural character of these historic buildings, including taking into consideration the building, the construction materials of the building, and the building's surroundings (Nelson, 1988). Most historically preserved buildings have undergone restorations, and few of the original construction materials are still present in the building; however, the building is always restored to retain its original form. The setting of a historic building has fewer restrictions on changes that can be made.

The property in Figure 4 is located in a district with limited parking. Converting the front yard into a parking area was considered, but doing so would "essentially destroy its setting and would drastically change the visual character of this historic property" (Nelson, 1988, para. 19).

Figure 4: A fenced-in lawn on a historic property
(National Park Service, 1988)

According to Nantucket architect Mickey Rowland, Nantucket architecture is designed to cater to the historic preservation of the island rather than the specific purpose of the building (M. Rowland, personal communication, October 27, 2017). For example, the MMA's Natural Science Museum at Hinchman House appears residential to preserve its historical significance, rather than presenting itself as a typical museum would, with extravagant columns and elegant front entrances that are reminiscent of Greek revival architecture (Historic New England, 2017). For this, less intrusive architectural features, such as benches and plantings, must be implemented to help the building stand out from the other residential buildings (M. Rowland, personal communication, October 27, 2017). According to the City of New York's guidelines on sidewalk accessibility, benches serve another function in that they allow those lacking the strength to walk for blocks on end the chance to sit down, relax, and catch their breath briefly (New York City Department of City Planning, 2013).

Wayfinding Technologies

Technologies such as cell phones, electronic tablets, audio guides, and Bluetooth beacons have become more advanced in recent years. With increased functionality, these devices are being used to improve wayfinding for cars and pedestrians. The increased use of cell phones and their mobile applications has allowed the tourism industry to create new ways to connect with visitors (Kennedy-Eden & Gretzel, 2012). Merje (2014) lists mobile apps, Global Positioning System (GPS) devices, pedestrian kiosks, and Quick Response (QR) Codes as part of wayfinding place technology (Table 1). Museums and botanical gardens are taking advantage of these technologies to enhance learning and wayfinding around their campuses.

Many studies compare pedestrian wayfinding abilities when using mobile navigation and paper maps (e.g., Ishikawa, Fujiwara, Imai, and Okabe (2008); Kobayashi, Lee, and Sumiya (2010); and Hergan and Umek (2016)). One of the main differences between these two navigation practices is that users with GPS-based navigation systems could simply follow the route on their cell phone screens after they initially oriented themselves on their devices, whereas paper map users need to continuously update their position mentally based on their surrounding environment (Ishikawa et al, 2008). Hergan and Umek (2016) argue the main advantage of a

mobile navigator is *egocentric positioning*, meaning the displayed environment is adjusted automatically according to the user's movement in different directions, and Hermann and Duesterhoeft (2003) found the participants using egocentric maps rather than north-oriented maps made fewer mistakes and travelled faster. Mobile navigation systems, such as iPhone-based navigation software, are believed to greatly improve route-finding abilities of pedestrians, yet users still get lost (Kobayashi et al., 2010). Hergan and Umek (2016) found that ten-year-old students frequently went beyond the correct turning point when using a mobile navigation system and turned too soon when using a paper map. They found that 87.7% of the ten-year-old students were able to successfully and independently complete the route using mobile navigation. Only 1.6% of the students were able to successfully complete the route independently using a paper map. However, Ishikawa et al. (2008) found that pedestrians using mobile navigation looked at their screens more frequently than the surrounding area causing them to acquire only limited knowledge about routes. When this study was conducted, cell phone screens were very small (4x5 cm), which forced users to look more intently at the display. Although there have been no specific studies to support this, a larger screen may improve spatial awareness because the screen would show the user more of their surrounding area, but that does not imply users would look at the screen less often. Users would still be relying on the information provided by the screen. Kobayashi et al. (2010) stressed navigation systems should support and complement user differences in wayfinding skills between real and virtual worlds. Kobayashi et al. (2010) found women predominantly use landmarks to navigate while men rely more heavily on cardinal directions, and GPS and compass information can be helpful for some users but not necessarily effective for all.

Audio-tours are another form of mobile guide to help visitors find their way. Lewi and Smith (2011) noticed most mobile app guides did not consider or seem aware of "the act of walking around sites and buildings as a fundamental enhancement of the experience of place" (p. 70). Many mobile apps strive to provide many features for the user but fall short in enhancing the experience because they are not explicit on which feature should be used at what time (Lewi and Smith, 2011). In 2009, they tested a two-hour walking architectural mobile tour on graduate students in Melbourne. This tour included twenty important nineteenth and early twentieth century buildings. A map screen and menu were used to navigate between buildings. Each stop had an audio presentation on the urban and architectural history and between one to three related images. Lewi and Smith (2011) found the guide was successful in ease of use and navigation, and the simple "walk-up-and-use interface style" was an appropriate level of interaction with the device; however, students said it was challenging to listen to all of the audio segments and more images would have been helpful. The tour was refined and tested again in 2010. Both tour projects suggest "a carefully chosen image or narrative presented on a mobile guide can reclaim some moments of dedicated attention for the architectural setting and its history" (Lewi and Smith, 2011, p. 75). Proper consideration of the material presented in an electronic tour is necessary to ensure the user is neither overwhelmed with information nor bored by a lack of engaging features.

A 2012 study in Salzburg looked into the effectiveness of three different navigation technologies: mobile maps, augmented reality, and voice-based systems. Huang, Schmidt, and Gartner (2012) examined the amount of spatial knowledge acquired with each of the technologies. Spatial knowledge is information about one's surrounding environment and it is important for wayfinding identification. This study tested spatial knowledge by asking the subjects after they completed the route which direction the starting location was, which direction they turned at various points, which landmarks they passed, and where landmarks were located along the route. Their study found all three navigation technologies led to poor spatial knowledge acquisition, with no statistically significant difference between the three. They argued only actively processed information will be learned and remembered and the use of these technologies was too passive to require active processing on the part of the user (Huang et al., 2012). While electronic options are useful for wayfinding, they can have negative effects on the user's acquisition of spatial knowledge.

In 2014, Jang and Lien reviewed two different mobile technologies for the National Palace Museum to use as educational tools. The mobile technologies featured the ability to view and interact with 3D artifacts, the provision of written and audio information, and "adaptive guiding route planning" (Jang and Lien, 2014). Jang and Lien (2014) state that "an ideal APP should take into account mobile scenario, social networking, mobile learning and multimedia techniques and should present museum artifacts in a more diversified, convenient and richer manner." They conclude by saying that with mobile technology "certain artifacts could be presented more deeply and more interactively. Users may gain a better visiting experience and have a higher learning efficiency. Museums could enhance their services by adopting this new technology to achieve their goals in exhibition, education, and research" (Jang and Lien, 2014). Although this article does not focus on wayfinding, it does provide a counterpoint to the Salzburg study, arguing that mobile technology can aid in education and provide more interaction for visitors. This disagreement between findings suggests the specific details of the technology determine whether or not mobile guides are useful, which is the conclusion Lewi and Smith (2011) made in their study of hand-held aids.

Quick Response (QR)[2] codes can be used for navigation as well. A study by Basiri, Amirian, and Winstanley (2014) investigated the use of QR codes on landmarks to help pedestrians navigate between places. Landmarks are a popular navigation tool, as mentioned previously by Kobayashi and Sumiya (2010), Devlin (2014), and Pati et al. (2015). Basiri et al. (2014) say because landmarks are stationary and distinct objects and places, they are used by pedestrians to develop a mental representation of the surrounding area. Basiri et al. (2014) claim the advantages of QR codes over the use of Bluetooth beacons are complicated computations are not needed to calculate positions, and QR codes are a push service rather than a pull service which saves battery and maintains the user's privacy. Basiri et al. (2014) say QR codes are a quick way to access data. Pérez-Sanagustín, Parra, Verdugo, García-Galleguillos, and Nussbaum

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[2] QR Codes are a grid of black and white squares that can be scanned in a similar way to scanning a barcode in order to get information such as a web address.

(2016) compared information delivered by QR codes versus screens at exhibits in the Royal Botanical Gardens at Kew in London. They found visitors spent more time consuming the information when it was delivered directly through text on an exhibit board or on a screen rather than indirectly by scanning a QR code (Pérez-Sanagustín et al., 2016). On the other hand, they found visitors liked to use QR codes when they entailed interactive and/or social components. Either way, QR codes did not appear to adversely affect the visitors' experiences with the exhibits. Ratings about the content of the exhibits given by the visitors were similar regardless of the method used to deliver the information (Pérez-Sanagustín et al., 2016).

In a Brooklyn Museum blog post in 2015, the former Vice Director of Digital Engagement and Technology expressed the difficulties the museum faced when installing and using iBeacons, a type of Bluetooth low energy device, which can be used to track location and send information to nearby devices. The Brooklyn Museum in New York installed iBeacons as "a location aware technology… to tell staff answering questions which gallery a visitor is standing in and what works of art are nearby" (Bernstein, 2015, para. 1). This allowed staff to have information of nearby displays more readily available, so staff could better converse with visitors and make connections with related works around them. Because the Brooklyn Museum did not want to hire an outside third party, some resources were devoted to internal coding tools needed, and a lot of extra staff time was spent installing the beacons. Since the beacons were stand-alone, battery operated units, a centralized management tool was not developed, therefore requiring each beacon to be tested regularly to make sure it was still working. Signal strength was also a problem as walls, objects, and people disrupted the signal. If displays were rotated, the beacons had to be reprogrammed. Needless to say, the Brooklyn Museum found that a lot of custom software and overhead was needed (Bernstein, 2015). Many of the comments to this blog post express similar difficulties with Bluetooth beacons in other museums including the Indianapolis Museum of Art, Canadian Museum of Nature, and Auckland Museum.

A study completed in 2017 by Boukhechba, Bouzouane, Gaboury, Gouin-Vallerand, Giroux and Bourchard tested a spatial recognition service called NomaBlue, an Android app using Bluetooth beacons that operate without internet and can be used in indoor or outdoor areas. Boukhechba et al. (2017) created their system based on a real-life situation: a person looking for a specific place in a city is likely to ask for directions from the people around him/her until they reach the desired location. The developed Android app was able to successfully retrieve information from Bluetooth beacons and share the retrieved information to users with the app on the same floor in a university building. The system is being developed to sense nearby Bluetooth beacons to gather information about city buildings and sharing it with other NomaBlue users (Boukhechba et al., 2017). Boukhechba et al. say NomaBlue could be used in multiple fields despite not reaching its full potential, and based on the way the system operates, could be used to improve wayfinding.

2.3 Organizational Identity and Identification

An organization's identity is a key part of how the public views it, and as a result of its success. We discuss a variety of tools organizations can use to establish their identities with the

public. Important methods for developing an organization's identity include marketing, social media, and branding. In this section, we discuss how these methods can benefit an organization and examples of how other organizations have used these tools.

Marketing in Museums

Marketing is essential to an organization's success in being easily recognizable by potential visitors. The Smithsonian Institution (2001) states, "museums have a mission to educate the public as well as build audience and revenue" (p. ii). This implies museums cannot follow the typical marketing strategies large corporations use. Instead, most museums follow an audience-centered pattern of marketing, in which the museum targets specific audiences to attract and then responds to the way these different target audiences react to its exhibits (Smithsonian Institution, 2001). To attract these audiences, organizations promote and distribute a wide variety of marketing collateral, or "all the print materials designed to support the sales and marketing functions" (Bowie, et. al., 2016, p. 228) of the organization. In organizations with multiple units and diverse functions, the types and formats of marketing collateral can vary substantially, sometimes so much that it is unclear how two types of collateral are related to each other or even the organization as a whole. Bowie et al. (2016) state "[i]ntranet technology has enabled [organizations] to develop solutions to the problem of delivering brand-consistent marketing communications collateral across all the units in the company," (p. 228) thus providing those within the company that wish to develop collateral the resources they need to conform to the organization's brand. These resources may include organization-approved logo formats, pictures, color themes, and templates. With a database of resources that can be used, an organization can produce a wide range of marketing collateral that clearly belongs to a single organization. Targeting specific audiences and introducing consistent collateral can be seen in the rebranding process at the Weisman Art Museum (WAM) on the campus of the University of Minnesota in Minneapolis.

The Weisman Art Museum redefined its target audience because the administration of the museum recognized it was not catering to its largest potential audience, the students of the college campus on which the WAM resides. College students prefer to participate in activities with friends, but the lectures the museum used to present at the exhibits did not allow for the social experience that students seek (Moses, 2015). To attract more college students, the museum created more interactive exhibits and workshops to replace many of the dry lectures (Moses, 2015). For example, rather than a slide lecture on an art period, there would be a workshop to teach how to paint in the style of that art period. As mentioned earlier, the Smithsonian Institution (2001) states that an important part of museum marketing is to "build audience." The WAM was able to accomplish this by working in conjunction with a group of University of Minnesota students by having the students share their ideas and suggest what the museum can do to attract more students (Moses, 2015). Of course, there are also other target audiences, such as families and older art enthusiasts the museum caters to. Therefore, to cater to all audiences, different types of programs run at particular times of the day and week, typically when these audiences tend to have free time and are likely to visit the museum (Moses, 2015). The

rebranding process for the WAM focused on recognizing audience segmentation, rather than a visual change or new logo.

Social Media and Businesses

Social media is a tool that has become more popular for businesses as a means to share information with their customers. The Australian Museum in Sydney was among the first museums to adopt a set, written-out social media strategy. This strategy included having a list of goals and a set of principles to achieve these goals through social media. In order to create this strategy, the museum held a workshop open to its employees to brainstorm social media goals and principles. The museum's overarching goal of social media is "[t]o inspire the exploration of nature and cultures through sharing; engaging; building relationships and influencing, while adapting our organisational culture" (Kelly, 2009, para. 5). Of the goals the employees developed, the most notable included increasing reach, influence, and relevance; personalizing interactions; creating ambassadors to promote the museum; and maximizing revenue (Kelly, 2009). These goals, although seemingly self-explanatory, must continue to be emphasized to increase the museum's social media outreach. These ideas of personalizing interactions with visitors and creating promotional ambassadors also align with both Baker, Adler, and Sillars (2010) and Agresta, Bough, and Miletsky (2010) who agree that social media should be used by companies to build relationships with their customers. To help the marketing team focus on the goals of the museum's social media pages, the museum developed a set of principles to keep in mind. Some of the most important principles included understanding social media is now a part of the marketing team's job; recognizing physical visitation to the museum is the end goal; and writing a post once but publishing it to a variety of social media platforms (Kelly, 2009). Social media guidelines, goals, and principles steer an organization toward using its social media presence to its greatest advantage. By ensuring every post is of high quality and lines up with the organization's mission statement, social media can be advantageous to the awareness of and physical visitation to an organization.

A social media presence does have a large potential to benefit a museum, but incorrectly using this medium can have drawbacks. Agresta et al.(2010), have noted that the center of social media is about socializing and having conversations with other users, which "is a big adjustment for communicators and marketers who tend to be focused on campaigns or isolated activation that have a defined start and end date" (p. 74). Kidd (2011) states that in order for a social media posts to have "successful participation" there needs to first be "frame alignment," (p. 66) which means the goal the museum is trying to accomplish with a particular post has to be interpreted the same way by those receiving it. Essentially the museum must contextualize any posts it makes so that anyone receiving them can properly interpret the message and understand the opportunities that are available for the visitor. Kidd (2011) also warns against simply posting to fill a perceived demand for content. Instead, Baker et al. (2010), suggest businesses should maintain a regular posting schedule; they argue noon and 6 pm local time are the best times to post, and "burst posting" is not a good way to distribute information.

Museum Branding

In a 2009 guide to wayfinding, Gibson argues that an effective brand combines "messages, shapes, materials, forms, and media as well as human factors like staff presence and appearance" (p.70) to establish an organization's identity to both the guest and the place it occupies. Furthermore, Gibson (2009) claims a proper and easily-recognizable logo goes a long way in achieving this effect, as it is something a person can immediately associate with the organization. Gibson (2009) concludes that by having sufficient branding, everything associated with an organization can become one cohesive group, rather than freestanding and independent entities. Improvements in branding to establish a cohesive organization can be observed in the Royal Museums in Greenwich, England, which rebranded through a logo change.

The Royal Museums consist of a planetarium, a maritime museum, a historical royal museum, and an old British sailing ship. Previously, guests were often unaware that these four sites were part of the same association, and the administration of the museums felt the current logo did not do enough to represent all of the different topics each museum covered (Museums + Heritage Advisor, 2017). To address this problem, the Royal Museums decided to update its logo for branding and recognition purposes. The previous logo is a splash of water to represent the maritime museum and sailing ship. The water is also in the shape of a crown to represent the royal museum. The droplets of water flying away from the splash appear like shining stars to represent the planetarium. Unfortunately, visitors failed to recognize the symbolism in the logo, and tended to only recognize the water splash and not the crown nor the stars (Museums + Heritage Advisor, 2017). To resolve this issue, the Royal Museums Greenwich adopted a simpler logo, which depicted the letter "G" for "Greenwich" with a vertical line from the tail of the "G" representing the Prime Meridian line that goes through Greenwich and is significant to maritime history (Museums + Heritage Advisor, 2017). The same logo is used for all four locations, with a different color associated with each. With one logo used at all four locations, guests can easily recognize which buildings and sites are part of the museum's campus. Each unique color allows guests to easily seek out a certain museum they may be trying to visit (Museums + Heritage Advisor, 2017). A unique text font in combination with simple color coding allows the Royal Museums Greenwich to appear as one cohesive organization to the public.

Any organization that provides a service to the public maintains a certain image, which it projects to the public via marketing practices. According to Miletsky and Smith (2009) a brand is the "sum total of all user experiences with a product or service," (p. 2) which in a large part is how the customer or visitor views the organization. Gibson (2009) further elaborates on this idea by stating that branding is essential to create awareness, enthusiasm, and loyalty for not just businesses, but even cultural organizations and other institutions. These are all important qualities for organizations serving customers or visitors, but in the context of wayfinding proper branding accomplishes much more. Gibson (2009) refers to the combination of wayfinding with branding as "environmental placemaking." This means the combination of a good brand and wayfinding design can create a sense of place for these organizations. This not only defines a space, but also make it more "appealing and coherent" for customers or visitors (Gibson, 2009).

While both wayfinding and branding can each be used to help make a positive experience for the visitor, together these two tools can be used to create an experience that will make the visitor want to come back over and over again.

2.4 Wayfinding and Identity Challenges at the MMA

Nantucket boasts a rich history, with the largest concentration of pre-civil war buildings in the United States. Nantucket became wealthy due to its lucrative whaling industry, but as the industry began to lose profitability, the island's economy suffered when petroleum was discovered in Pennsylvania (Seegers and Giordano, 2015). Eventually the changing economic conditions caused an exodus to take place leaving behind an assortment of historic buildings that now serves as a core to attract tourism (Seegers & Giordano, 2015). In order to preserve the island's architectural and cultural history, the Nantucket Historic District Commission (HDC) has a strict list of regulations regarding construction, streetscapes, etc. The regulations that make wayfinding and identification most difficult for the MMA are the signage restrictions. The HDC requires that a sign plan be approved before installation. Some of the most inhibitive regulations to the MMA's goal are the prohibition of signs placed on sidewalks and public property and the prohibition of off-premises signs advertising commercial activities on another lot (Nantucket Historic District Commission, 2017). With limited signage, it is difficult for visitors of the MMA to recognize which buildings are part of the campus and how they are all associated with each other and the MMA's mission and identity.

3. Research Methods

Our overall project goal was to determine steps the Maria Mitchell Association (MMA) could take to improve visitor wayfinding and promote its organizational identity. In order to achieve this goal, the team created four objectives:

- **Objective 1:** Identify wayfinding and identification strategies used by other institutions.
- **Objective 2:** Determine the perspectives of key stakeholders regarding the wayfinding and identification challenges the MMA faces, identify previous efforts to address the challenges, assess current signage and marketing materials, and evaluate potential solutions.
- **Objective 3:** Examine budget, design, and regulatory constraints as well as wayfinding and identification approaches others have used on the island.
- **Objective 4:** Propose a set of recommendations that includes materials and designs the MMA can implement to improve visitor wayfinding and identification.

We laid out a timeline of our objectives and tasks in a Gantt chart (see Appendix A). This chart assisted us in time management and ensured we completed the project in a timely fashion. Our objectives entailed a variety of tasks (Figure 5) that included interviewing key stakeholders, identifying and evaluating possible solutions, and holding an exit meeting.
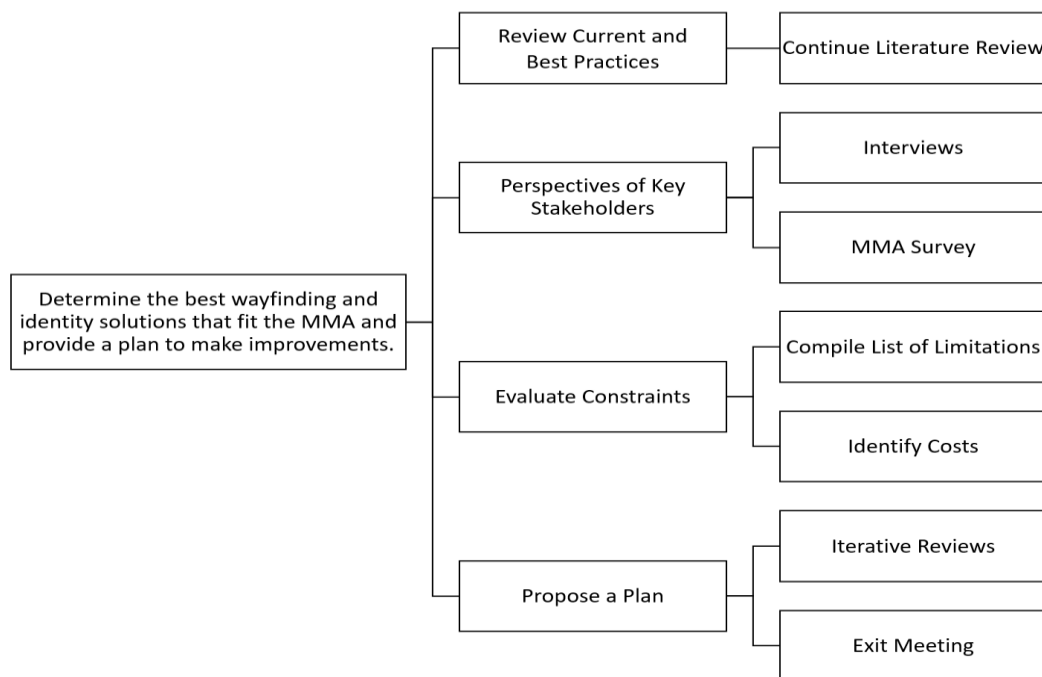
Figure 5: Project goal with subsidiary objectives and tasks

3.1 Identifying Wayfinding and Identification Strategies

In order to develop recommendations for the MMA, we first identified how wayfinding and identification challenges are addressed by various institutions. We began by defining and understanding what wayfinding and organizational identity are and what is encompassed in these topic areas. Then we sought to find what different types of strategies and best practices have

been used to tackle wayfinding and identity challenges in the past. We identified characteristics of the MMA that presented unique challenges to wayfinding and identification, building upon the various strategies in wayfinding and identification technologies and practices used by other institutions and summarized above (Section 2.2). We interviewed several stakeholders that have the unique combination of expertise in their field and experience with the constraints associated with living on Nantucket. These stakeholders included a local architect on the island, local business owners, and local museum institutions that struggle with similar problems.

3.2 Determining the Perspectives of Key Stakeholders

In order to learn more about the nature of the wayfinding, identity, and identification challenges faced by the MMA, we contacted key stakeholders on the island and surveyed MMA board members, staff, and supporters. We conducted interviews with a variety of stakeholders to determine the range of opinions regarding the wayfinding, identity and identification challenges the MMA faces, previous efforts to address them, and potential solutions. These stakeholders included MMA staff, interns, and board members, as well as representatives of cultural organizations and pertinent local government offices, committees, and commissions. We used the survey to generate data on visitation trends, wayfinding preferences, and wayfinding concerns at the MMA; we also wanted to gauge whether respondents would scan a QR code or type in a short website address to gather more information.

Interviews

Interviews were semi-structured and qualitative. We conducted these interviews face-to-face whenever possible. In the event that someone was unavailable to meet, we conducted the interview via phone or email. If one of our potential interviewees declined our request, then we asked them to suggest others with similar knowledge who might be willing to be interviewed. At the beginning of the interview, the team confirmed that the interviewee still consented to the interview, and during the interview, the interviewee had the right to stop at any time or refuse to answer a particular question. If any person we interviewed wished for their comment to be anonymous or unpublished, we obliged them. Everyone we quoted in our report had the opportunity to review the text prior to publication, as we explained in the preamble at the start of the interview (see Appendix B). We conducted our interviews with one lead interviewer and one or more note takers. In addition to written notes, we also created an audio recording, provided the interviewee consented. After conducting each interview we made note of important responses and anything we wanted to quote in our final report. For direct quotes, we listened to the audio recording. Additionally, we analyzed the information between different interviewees for common ideas and contrasting opinions.

We developed a basic set of interview questions and protocol (see Appendix B) based on our background research. We tailored this script for each interview after consultation with MMA staff members by discussing what topic areas a particular stakeholder would have knowledge and expertise in. After some preliminary discussion with our sponsor, we developed a list of potential interviewees which we proceeded to contact by email. We introduced ourselves, explained our

project, and explained how we believed they could help us with our project. If they consented to the interview, we sent a follow-up email to schedule an appointment. We conducted interviews with representatives of the following stakeholder groups (See Appendix C for individual names):

- MMA board members, staff members, and interns;
- The Nantucket Historical Association;
- ReMain Nantucket;
- Egan Maritime Institute;
- The Office of Culture and Tourism;
- The Sign Advisory Committee of the Historic District Commission;
- Architects on Nantucket; and
- Others, including local businesses, involved in identification and wayfinding on Nantucket.

Each interview helped us gather information about the topic areas of wayfinding, navigation, branding, and identity on Nantucket. We chose to interview MMA staff members, members of the board of directors, and interns because they have a better understanding of how the MMA perceives itself and how it hopes to be perceived on Nantucket. Those involved with the MMA also know of the organization's history, and potentially some of strategies it employed to consult these wayfinding and identification challenges in the past. Other cultural institutions were interviewed because they have dealt with problems in wayfinding and identification as well, and could identify which strategies they have used that were either successful or unsuccessful. We interviewed an architect on Nantucket, a representative of the Sign Advisory Committee of the Historic District Commission, and other local government entities because they are familiar with the regulatory limitations in Nantucket on wayfinding, including signage, landscaping, hardscaping, and architectural features. We selected owners of specific local businesses to interview because they use more specific strategies to improve wayfinding and identification, such as using social media, creating visitor maps, and encouraging visitor feedback on sites such as TripAdvisor.

After conducting the interviews, we compiled a table of the responses for each question based on the organization/stakeholder group that the interviewee represented. This table categorized the various responses and grouped those who had responded in a similar fashion together. This visual aid acted as a tool for us to develop trends in the responses. This also allowed us to compare what we learned from our background research with what the MMA staff thought. We were able to identify areas of improvement where several MMA affiliated interviewees concurred on a particular issue. When comparing the responses of people from other organizations, we were able to identify potential strategies that could be used by the MMA.

MMA Survey

In addition to interviews we also conducted a short, anonymous online survey (see Appendix D) of a selection of MMA staff, board members, members, and active supporters. We initially planned to send the survey to the entire member list (approximately 700 people) because they are an integral part of the MMA community, and we wanted to understand their perspective

on the challenges the MMA faces in terms of wayfinding, identity, and identification. However, the MMA had plans to conduct a member survey in December and was concerned about respondent fatigue and other possible adverse impacts if we also sent a survey to members. Instead, MMA staff selected a sample of 119 MMA staff, board members, members, and active supporters. We sent the survey to this sample, which was much more efficient than trying to interview each contact individually. Out of the 119, we received 24 responses. Because MMA staff, board members, members, and supporters are more knowledgeable about the association than a typical tourist, we asked them how they would describe the MMA to someone who has not visited it before. We used this survey to generate data on visitation trends, wayfinding preferences, and wayfinding concerns at the MMA. We also wanted to gauge whether QR codes and typing a web address into a phone would be practical means of informing visitors. With the sample population changed from the entire member list to a list of selected board members, staff, and contributors, the data we received is biased towards those more heavily involved with the MMA, which changed the scope of the conclusions we could make.

Our team created the survey using Google Forms instead of a paper survey. This platform was chosen because once someone submits a response to the survey, the data is directly stored in a Google Sheet to facilitate analysis. Once we developed preliminary survey questions, we consulted with MMA staff to have them test the survey and give feedback. After revising the survey based on the feedback, we sent it out to the list of contacts given to us by the MMA. We analyzed the data to identify visitation trends, navigation preferences, and whether the MMA's visitors are a suitable user base for QR codes and web addresses. We used this data when deciding what recommendations to make and what deliverables to present to the MMA.

3.3 Evaluating Constraints

As part of the process of identifying solutions to the MMA's wayfinding, identity, and identification challenges, we identified and examined the constraints on possible solutions. We began by identifying what types of legal constraints exist on Nantucket that would affect our ability to modify the campus including: building; zoning; and signage regulations. We sought to gain cost information from both local and off-island distributors about various solutions to each challenge in order to present expensive and complex options as well as basic and affordable options for the MMA to resolve its wayfinding and identity challenges.

Legal Requirements and Constraints

In order to preserve the historic nature of the island, the Historic District Commission (HDC) has created a list of regulations that we reviewed and took into account when choosing which options would be suitable for Nantucket's historic atmosphere. This includes regulations for signage, landscaping, hardscaping, and lighting. Our team discussed these regulations with representatives of regulatory bodies and with relevant stakeholder organizations who have experience working under these restrictions using the protocol in Appendix B. In conducting these interviews, we wanted to gain a better understanding of how other organizations have been affected by the regulations and what they have done to meet their own needs while meeting all of

the HDC's guidelines. We compiled a list of the relevant regulations and other restrictions into a comprehensive list of limiting factors. This list of limitations served as a checklist of the standards each possible solution needs to meet to be considered viable. Some of the most relevant were the signage and architecture guidelines.

Budgeting Possible Solutions

As part of the process of selecting viable solutions, we also considered costs. We examined the varied costs not just of different solutions, but also of different versions of each solution. To gather price information about signs, we asked a local business and an off-island business for information regarding the prices to restore existing signs as well as make new ones.

Our team evaluated the benefits of more complex, costly versions compared with less expensive but more basic alternatives. Another factor we needed to consider was whether or not our proposed solutions would have significant long term maintenance costs. In order to lower expenses for the MMA, we considered alternatives, such as donations, fundraisers, and volunteer work. We explored these opportunities as part of our interviews, where we could gauge an organization's interest in helping us, or ask if there was anyone who might be interested and worth contacting.

3.4 Proposing a Plan

In order to propose a plan of action for the MMA, we wanted to know what staff members desired in terms of information for an overarching brochure, notice board usage, and website and social media improvements. Additionally, we consulted the board of directors to understand what solutions would be feasible for the organization based on budget, staff capabilities, and time required to implement the solutions. We also wanted to consider limitations like number of signs at locations, costs of our proposed solutions, and how the MMA may fund any of our recommendations. After conducting our research and analyzing the interview and survey responses we collected, as discussed in Sections 3.2.1 and 3.2.2, the team created a budgeted list of design modifications and marketing options for the MMA. These modifications include new or improved signage; updated landscaping and hardscaping; new forms of marketing collateral, such as brochures and flyers; improvements to social media postings; and mobile apps or websites with guided tours, maps, and other visitor information.

We provided a list of recommendations for signage, landscaping, and social media sites, and consulted relevant and reputable sources on Nantucket to discover how each of these areas could be improved. We spoke with MMA staff, board members, and interns about their opinions on the MMA's current signage, landscaping, and social media pages. After collecting dimensions and conditions of all the MMA signs, we determined which signs are worn out and difficult to read. Then, we prioritized which signs should be replaced first after taking into consideration our conversations with MMA staff and board members. Additionally, we spoke with a member of the HDC's Sign Advisory Committee to understand what types of signage are acceptable; Nantucket architect Mickey Rowland to learn about architectural features that improve wayfinding and identity; and a local business owner to discover how social media can be used

effectively. Taking all of these stakeholders' views into consideration, we then constructed a set of recommendations for each of these areas.

The MMA currently has a lot of different flyers and marketing collateral. We proposed a simple brochure that encompasses the entire organization to target the average "day tripper." Initially, we asked MMA staff members, board members, and interns what information would be preferred for a brochure that encompassed the entire organization. Once we compiled a list of all the responses, we consulted the MMA's Director of Development and Communications to create a prototype.

On the MMA website, there is a simple Google My Map. When developing a prototype in Google My Maps of an improved version, we evaluated the benefits of paper maps and electronic maps and discussed what the MMA staff wanted their maps to feature. We received feedback from MMA staff members and our peers by sending them the link and having them test it on their computers and cell phones.

As we determined possible solutions, we also considered creative ways the MMA can fund these changes. This included donations, volunteer work, or fundraisers. During this process, we met with MMA staff members to gauge their feedback and make adjustments to our suggestions so our recommendations fit their needs more suitably.

Once we completed this iterative process, we held an exit meeting with the MMA staff to present our final recommendations. We aimed to make our proposed solutions as cost-effective as possible when compared to the increase in visitation they achieve. We also chose to consider ease of implementation and maintenance in our decisions because the MMA staff takes on a variety of daily tasks and would have difficulty taking on more responsibilities.

4. Findings and Discussion

The following chapter includes findings about the use of different logos by the MMA, signage that should be improved, landscaping options, the MMA's online presence, audience segmentation at each building, and organizational image. Additionally, we discuss options we originally researched that are not viable for the MMA at this time.

4.1 MMA Brand and Two Logos

The MMA lacks a clear identity and the use of two logos causes furthers confusion. Additionally, inconsistencies in the use of each logo makes the association seem unorganized and less professional. The MMA's logo usage guidelines are outdated and often ignored, leading to a lot of variation in marketing collateral. The following sections discuss the MMA's inconsistent usage of multiple logos and variations in marketing collateral.

Inconsistent Usage of Multiple Logos

The MMA lacks consistent branding and identity. According to Gibson (2009), one of the central aspects of any brand is the logo that an organization uses. The MMA currently uses two different visual identities: (1) a more modern logo (Figure 6) on its website, printed material, and sign for the Washington Street Facility; and (2) its previous logo (Figure 7) on signs outside each facility.

Figure 6: The MMA's current logo

Figure 7: Old woodcut MMA logo

When we interviewed MMA staff and board members there were a variety of opinions regarding the two logos the organization currently uses. Many staff and board members thought the old woodcut was appealing aesthetically, but it does not convey the natural science aspect of the MMA's identity, is very "busy" and complex, and is impractical for usage in company collateral and digital media. The current logo has a more contemporary look, but it does not clearly convey what the MMA does and is almost too "vague." Additionally, Figure 8 shows the current logo is not consistent with some versions having different text or a slightly different design including different words being italicized, different arcs for the white stripe, and the addition of a drop shadow. Some of our interviewees recognized that having two different logos had the potential to be problematic to the organization. Our survey results regarding whether the use of two logos could cause confusion were almost evenly split between yes and no, with a slightly larger number of respondents saying the two images could cause confusion. Since the survey included primarily MMA board members and supporters, it may not represent the views of the wider audience of visitors, but it is likely the use of the different images causes similar confusion and lack of clarity. According to Trinity Foreman, the MMA's Executive Administrator and Marketing/Event Coordinator, "for a new logo or brand to work you need to just wipe everything [of the old logo] out and start from scratch to really replace it." (T. Foreman, personal communication, November 2, 2017). This aligns with what we have found in the literature, as Miletsky and Smith (2009) also state "[e]very last bit of the old brand (if any) has to vanish and be replaced with the new brand" (p. 39). However, this is not the case at the MMA, where most marketing collateral uses the current logo, but the majority of the signage still uses the old woodcut logo.

Figure 8: The many variations of the MMA's current logo

During an exit meeting with MMA staff and board members held on December 5th, we displayed the logo in Figure 9. This logo had only been used briefly in the past to promote the project for a combination aquarium and science center at 33 Washington Street, which has since gone on hiatus. The staff was pleasantly surprised by this logo since it had more details such as a comet and grass that portrayed the astronomy and natural science aspects of the organization. Additionally, it promoted the "Land, Sea, and Sky" of the MMA's mission statement. It was not seen as perfect, but the staff agreed it would be a good starting point if the MMA decided to create a new logo that better encompasses it as an organization.

Figure 9: Aquarium and Natural Science Promotional Logo

Marketing Collateral

The MMA's branding also suffers from a lack of consistent and comprehensive marketing materials. The MMA prints a large amount of flyers to advertise the many programs and events that it holds each year. However, these flyers lack a consistent format, and there is no brochure that currently covers the MMA's mission and offerings as a whole. There is a booklet that lists all the programs offered in season, but no daytrip visitor is likely to pick up a 30 page booklet when they are only on Nantucket for a short period of time (J. Schulte, personal communication, October 27, 2017). The MMA maintains a collection of marketing materials from the 1980s to the present, including brochures, flyers, mailings, and articles. The most significant finding from these binders was that in the past there was always an overarching brochure targeted to short-stay visitors (example in Figure 10). These brochures summed up the variety of programs, events, and attractions the MMA offers in only a few pages, and consistently included the following sections and information:

- "About Maria Mitchell"
- "About the Maria Mitchell Association (MMA)"
- "Programming," including some highlighted events and programs
- "Membership," including the benefits of membership and how to become a member
- "Locations," including a map with pictures and short descriptions of each MMA property

This aligns with the sections MMA staff believed should be included in an overarching brochure. Additionally, in our interviews with staff at the Nantucket Visitor Services Center, we found most of the other cultural organizations on Nantucket currently have such brochures, and the MMA would benefit from having one as well. The Nantucket Historical Association (NHA) uses a brochure (Figure 11) that highlights the Whaling Museum and includes additional historic sites the NHA operates. This overarching brochure includes the major attractions, addresses, walking

times, and descriptions. It also includes the ferry terminals, which are the main points of entry to Nantucket.

Figure 10: Old brochure no longer in use (cover page and first two inside pages)

Currently, the MMA has an assortment of flyers with different formats, each covering only a few aspects of what the organization has to offer. Many MMA staff and board members we interviewed believed that without the logo on the brochures, people would be unable to recognize that they are advertising the same organization. One example of this is shown in Figure 12; it is unlikely anybody would know these two brochures were for the same organization because of the stark differences between the designs and the lack of a logo on the Mitchell House brochure. Additionally, the Mitchell House brochure has the address on the front, whereas the Open Nights flyer does not have an address on it. The Mitchell House brochure is very text heavy with a small picture on the front because it is targeted towards adults. In contrast, the Open Nights flyer has bright colors and is very simple in order to be more appealing to a wider audience (i.e., adults, families, young adults). The Open Nights flyer also has the admission prices on the front whereas the Mitchell House brochure does not have any pricing information in it.
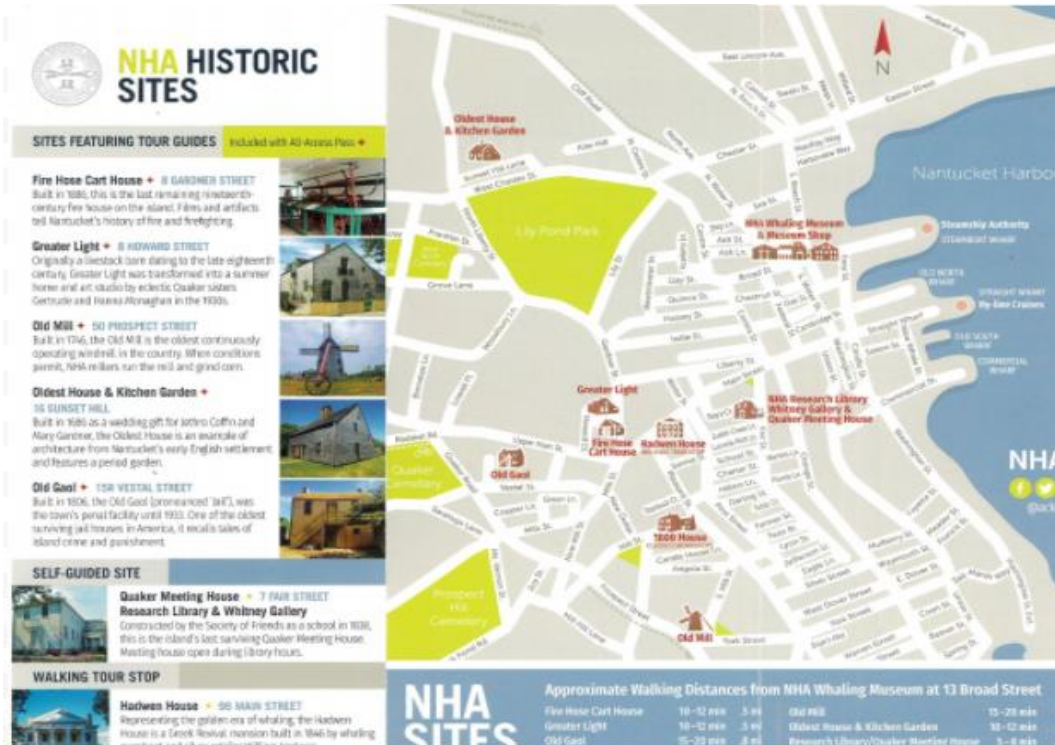
Figure 11: Inside pages of the NHA whaling museum brochure

Figure 12: Two brochures, advertising two different MMA properties, lacking a consistent format and appearance

Figure 13 is an annotated version of the MMA 2017 Speaker Series flyer. As marked in red, the logo is hidden amongst the other pictures. Maureen Deiana, WPI's AVP Marketing Communications and Chief Marketing Officer, it is important to have standards about logo placement in collateral, consistently setting the mark apart for easier recognition rather than randomly mixing it with other art. (M. Deiana, personal communication, October 3, 2017). This flyer does not have all the information on the front (i.e., schedule and pricing), perhaps because the schedule is lengthy and more detailed compared to other programs. The Science Speaker Series flyer is targeted mostly towards adults, but younger adults and children, who were not targeted especially well, may also have been interested in the talks.
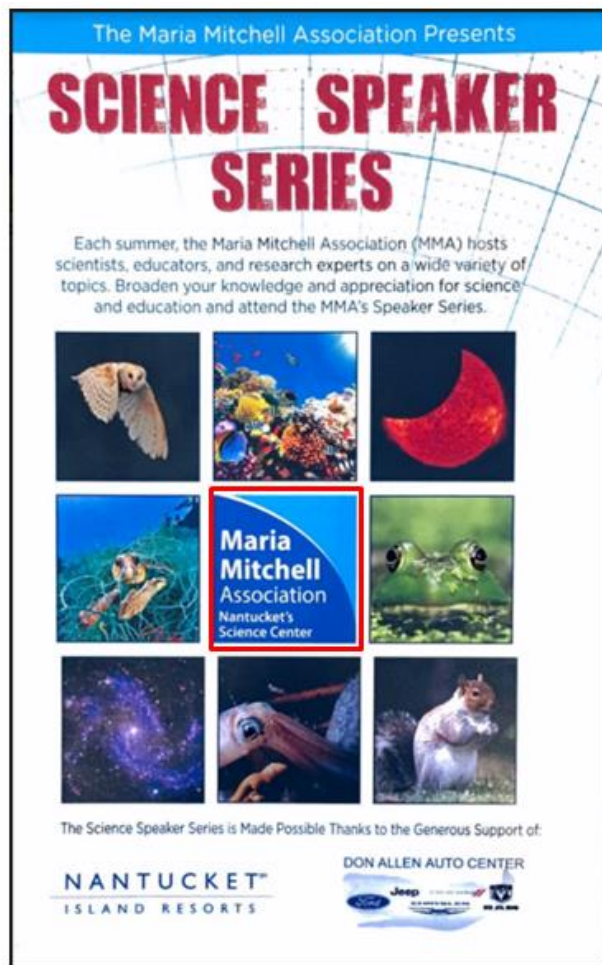
Figure 13: 2017 Science Speaker Series Flyer

Addressing the inconsistencies in marketing collateral has been put off by the organization because the MMA only updates and reprints its brochures when it runs out of a certain brochure. According to Jascin Finger, curator of the Mitchell House, the brochures at the Mitchell House have been the same for years because so many were printed, and the MMA has yet to hand all of them out (J. Finger, personal communication, November 2, 2017). These brochures are now outdated but are still given out to visitors. In addition to the MMA locations, the MMA's marketing material is sent to other locations it does not own, including local

businesses, hotels, and the Nantucket ferry terminals. The MMA currently does not have marketing material at the Hyannis ferry terminals, where many people coming to Nantucket pass through, but there are advertisements for MMA facilities on the Hy-Line ferry television screens.

When the MMA created its current, contemporary logo (Figure 8: top left logo), a set of branding guidelines were also developed to accompany it. These guidelines outline aspects of the MMA's brand including the usage of the logo, the font used by the organization, and the layout of stationary/business cards. These guidelines were established in 2008 and have not been updated since February 2009. It appears that no one is currently following them. This is most evident in the variation of business card layouts. Figure 14 is an example of two business cards of MMA staff members. There are two different logos of different sizes, different sized text, different alignments in the top right corner, different order of contact information, and different text bolded.

Figure 14: Two different MMA business cards

4.2 MMA Signage

Since signage is highly restricted on Nantucket, it is important that the MMA use its allotted signage in an effective manner. The following sections highlight the current signage the MMA owns or is mentioned on, and other signage options it could consider. A sign inventory can be found in Appendix E. The current forms of signage the MMA uses include:

- Free standing signs;
- Signs on facilities;
- Notice boards; and
- Signage not owned by the MMA.

Free Standing Signs

The MMA uses two different types of free standing signs (Figure 15): (1) a hanging sign outside the Aquarium and (2) a standing sign at the corner of Milk Street and Vestal Street with a map of the Vestal Street Campus. These signs do not follow HDC guidelines, but because they were there before the HDC was established, they do not have to be taken down.

Figure 15: Free standing signs used by the MMA: map of Vestal Street Campus (left), Aquarium sign (right)

The sign at the corner of Vestal Street and Milk Street is old, worn out, and very dirty. A Research Center sign is laminated over the old Research Library name, the hours of the Vestal Street Observatory tours are laminated at the bottom, and the sign is very dirty. Many staff and board members report a lot of pedestrians, especially those walking up Vestal Street to see the Old Gaol, walk past this sign without reading it. When asked by a MMA staff member or board member if they are interested in the MMA, they often indicate they are unaware of what the MMA is or what it does.

Signs on Facilities

There are three types of signs on the MMA buildings: (1) the woodcut logo with the name of the building, (2) the woodcut logo with the name of the building and a separate plaque

with the hours of operation on one side and "closed for the season" on the other side, and (3) the new blue square logo. While the MMA has many different forms of signage, the signs are in various conditions from pristine to barely readable. The Mitchell House and Loines Observatory signs suffer from sun damage, mold growth, and delamination. The Administrative Building sign on Drake Cottage and the sign on the back of Hinchman are the most pristine signs.

The Research Center will need a new sign once its renovations are complete. It is important for the MMA to consider its plans for future branding so that when the sign is installed on the Research Center, it will match the MMA's brand. Both the University of Washington (2015) and Martin (2006) stress the importance of uniform signage on college campuses by saying signage uniformity is important and clarifies the campus. Signs without uniform text font, appearance, and main color choice would appear to belong to a variety of organizations, not just a single one (University of Washington, 2015).

We consulted Paul McCarthy at Nantucket Carving and Folk Art to determine the cost of restoring or replacing all of the signs the MMA owns. Appendix F has all of the pricing information for the signs to be replaced using his design. Paul McCarthy designed the signs without the woodcut logo and to look like the sign that was made for the 33 Washington Street building (Figure 16). Additionally, the words "Nantucket" and "Association" were removed. These choices were made to reduce the cost of the signs. He also believes including "Nantucket" on a sign for a building on Nantucket is redundant and "Association" does not provide any additional information. We also consulted an off-island company named Signs In Wood in Bonney Lake, Washington gave us estimates for the sign on the corner of Milk Street and Vestal Street and a plaque used to display if the building is open or closed. The sign was modelled with the woodcut logo. Those prices can be found in Appendix G.

Figure 16: The sign made for 33 Washington Street

Notice Boards

The MMA has two public notice boards: one at the corner of Centre Street and Main Street and another at the corner of Milk Street and Main Street. Additionally, there was a notice board in front of the Research Center that rotted and fell down and has not been replaced yet. The purple dots in Figure 17 show where the current notice boards are in relation to the MMA's buildings, and the yellow dot represents the notice board that used to be in front of the Research Center. These noticeboards are used to promote MMA events which are printed on paper flyers. In the summer many events occur, and the notice boards become cluttered and unkempt. Once a week a staff member is supposed to take down old flyers and put up new flyers, but in the

summer, staff get overwhelmed with other work and flyers may not be taken down and put up resulting in old flyers remaining in the notice boards.
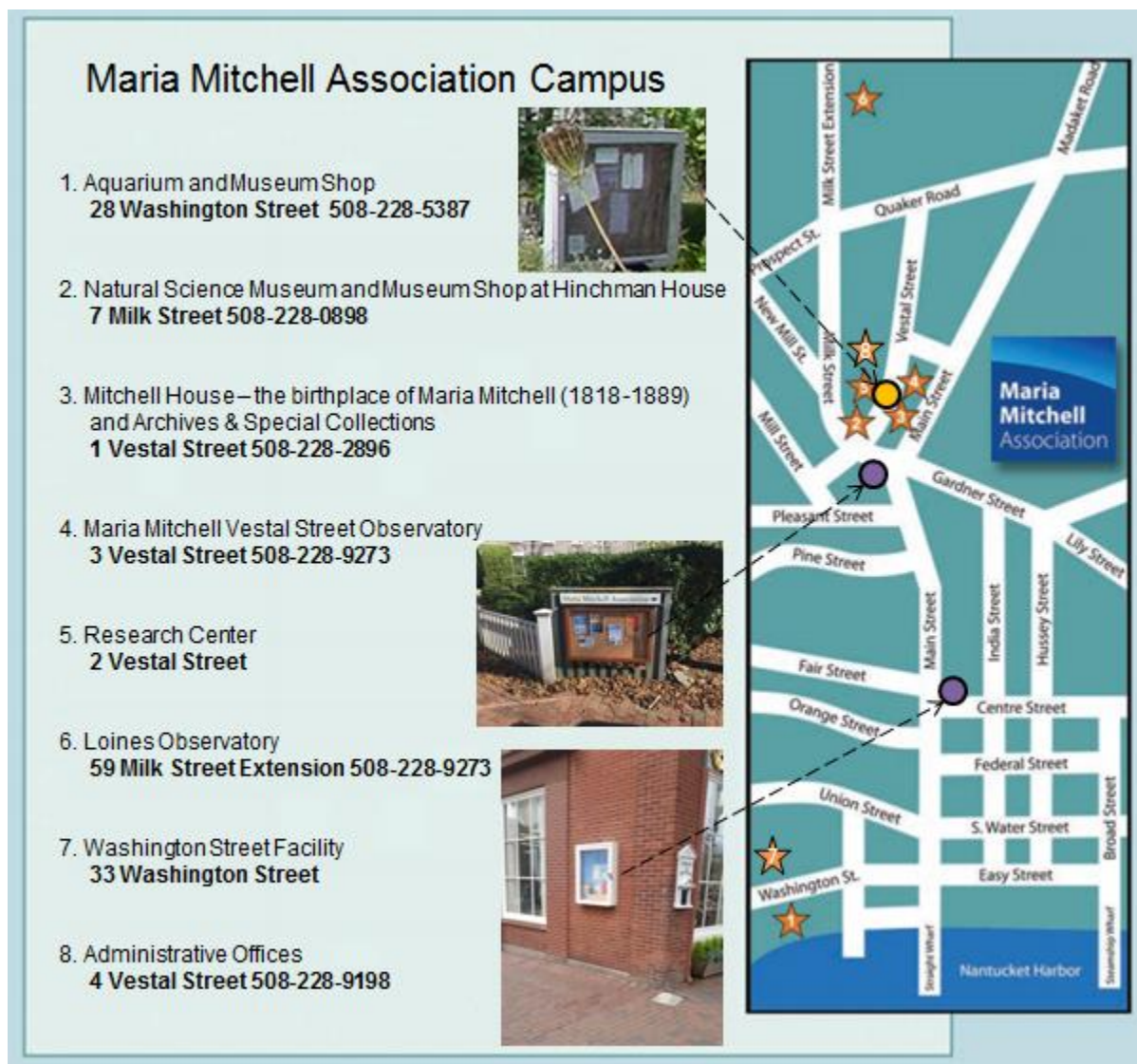
Figure 17: Map with public notice board locations and pictures

Currently there is not a map on either of these bulletin boards; the addition of a map would aid visitors in finding their way to the different MMA buildings. Our conversations with MMA staff, board members, and interns indicated that including a simple map and the addresses of MMA locations in these noticeboards would be beneficial to visitors using both paper and digital maps. Many staff members also said it would be helpful to have tear-off maps at every location so maps could be easily given to guests. The MMA also supplies a printable map on its website, and there is a simple Google My Map as well. 66% of the survey responses show most respondents prefer to use a map, paper or digital, to navigate an unfamiliar place. Studies done by Ishikawa et al. (2008); Kobayashi et al. (2010); and Hergan and Umek (2016) emphasize the importance of both digital and paper maps in wayfinding. However, if a map were added to the

bulletin board, the viewer would be unable to take a physical copy with them, but they may be able to take a picture of it. As useful as these noticeboards may sound, George Donnelly, the MMA's Director of Development and Communications, views the bulletin boards as a passive form of advertising and was not sure if they could be more effective (G. Donnelly, personal communication, November 7, 2017). Once the notice boards are organized neatly with only up-to-date flyers, there is no way (i.e., flashing lights) for the MMA to grab the attention of nearby pedestrians.

After discussing with staff, we concluded that Bluetooth beacons and QR Codes would not be useful features to add to the bulletin boards. Bluetooth beacons require a lot of maintenance as discussed in the 2015 Brooklyn Museum blog post, and the MMA would not be able to keep up with maintaining the Bluetooth beacons in the summer. Survey responses show only 15 out of 24 respondents were familiar with QR Codes, and very few of them would be likely to actually scan one to get more information. However, 18 out of 24 respondents said they were likely to type in a short web address such as mariamitchell.org.

Signage Not Owned by the MMA

The MMA is mentioned on two public signs that it does not own: (1) a finger post sign in the center of town (Figure 18) and (2) a fire box on Vestal Street (Figure 19). The MMA shares a spot with two Nantucket Historic Association (NHA) properties: the Old Mill and the Old Gaol. However, the name Maria Mitchell alone is not very descriptive. Many staff members say pedestrians are known to stop and use the fire box map on Vestal Street because it is the first map they encounter when coming from the Old Gaol and heading towards Milk Street.

Figure 18: Finger post sign on the corner of Main Street and Washington Street

Figure 19: Fire box on Vestal Street in front of the Vestal Street Observatory

The MMA even added an "information" box next to it with brochures. However, the vegetation around the fire box is overgrown causing the information box to be hidden in the bushes, and in the summer, staff fail to keep the box filled with brochures. Because the MMA does not own these two forms of signage, it cannot change them, but it is beneficial to know where potential visitors may be looking and see the MMA's name.

Other Signage Options

In addition to improving the current signage, there are other locations where the MMA could place signage to assist in visitor wayfinding. Other organizations on Nantucket have used creative forms of signage that comply with the HDC's regulations. Outside of the historic downtown, rock signage (Figure 20) is being used at beaches, cemeteries, and organizations such as Egan Maritime Institute at the ends of their driveways. However, MMA staff expressed opposition to rock signage because it can be hard to read and introduces another appearance for MMA signage. Organizations such as the Nantucket Land Bank (Figure 21) are using signposts to mark open spaces they maintain. Based on our interview with a member of the Sign Advisory Committee of the HDC, rock signage would be the option with the highest probability of approval. The sign in Figure 21 is for areas where there are no buildings to place a sign. The only facility where the MMA may be able to use a sign like this would be Loines Observatory because the surrounding area is not very residential.

Figure 20: An example of rock signage being used at Steps Beach

To assist the MMA in keeping track of its signage and the condition of each separate sign, we have created a catalog of all the signs the MMA owns (Appendix E). According to Chris Young, a member of the HDC's Sign Advisory Committee, organizations that approach the HDC with new proposed signage are likely to be required to create a master sign plan, in which the organization develops a list of locations, types, and dimensions of their signage and presents it to the HDC (C. Young, personal communication, November 3, 2017).

Figure 21: Nantucket Land Bank sign

If the MMA were to replace a sign with a sign that looks exactly the same as the previous one, it would not have to create a master sign plan. However, if the MMA were to replace current signs with a sign that did not look exactly the same, the MMA would have to submit a master sign plan and a sign application for each individual sign. Creating this signage catalog will expedite the process of creating a master sign plan for the MMA if the HDC indicates it must do so.

4.3 MMA Landscaping

The MMA can use landscaping as a tool to make its buildings stand out more and catch visitors' attention more readily. Landscaping provides a viable alternative to changing the architecture, because "the architecture, at least on Nantucket, is not specifically designed around the use of the building, but more to fit in with the neighborhood," which means the MMA's properties do not stand out like other commercial buildings (M. Rowland, personal

communication, October 27, 2017). The MMA relies on landscaping and hardscaping features to help promote its purpose and stand out from the surrounding residential buildings on Vestal Street. Indigenous plants are used in the MMA's landscaping in order to encourage wildlife and promote the adoption of such plants by the public. Unfortunately, many members of the public see plantings of milkweed and the like as unkempt and uninviting (Figure 22). Small laminated tags explaining the purpose of these plantings could alleviate some of the confusion and promote the MMA's natural science focus. Some board members and staff also suggested consistent landscaping, such as blue flowers or berry bushes at all the locations to make the campus more cohesive. Many MMA staff and board members said the properties should be "crisp" in appearance, meaning these properties should maintain their native plantings and historic preservations while appearing clean and welcoming to visitors.

Outdoor structural architectural features also assist in wayfinding and identification. Mickey Rowland suggested benches could be implemented to show that a building is open to the public, rather than being someone's private property. According to the New York City Department of City Planning (2013), these benches would also serve a secondary function in that they allow those with physical disabilities the chance to sit down and rest.

Figure 22: Overgrown milkweed and other vegetation at the back of Hinchman House

Some of the facilities (Mitchell House and Research Center) have picnic tables which could also be used instead of benches. MMA board members also believed uniform fencing could be utilized at each location, particularly the properties on Vestal Street, to create a visual unity for the campus. Currently, the fences on the Vestal Street properties have different appearances

including different colors, heights, and lattices. A uniform use of fences would create a visual unity that in turn could assist potential visitors in recognizing that each of these separate locations belong to one organization. In any case, architecture should not be overlooked as a solution to wayfinding and identification for the MMA.

4.4 MMA Online Presence

Over the years, the MMA has expanded its online presence. Online presence is a form of pre-arrival technology according to Merje (2014) and can increase visitor knowledge. The MMA has multiple social media sites, a website, and other sites where visitors can access and post reviews (i.e. TripAdvisor, Google Reviews).

Social Media Presence

The MMA has a presence on various social media sites, and while this presence has been developing in the past years, it has the opportunity to improve. The MMA has several social media pages including Facebook, Twitter, Instagram, and Tumblr. Social media is a free form (with the exception of staff time in developing and maintaining) of advertising, promoting, and marketing an organization, and is therefore a method of interest for improving visitor recognition of the MMA. Most of the MMA staff and board members agreed the MMA's social media presence has been growing in the past few years, but still can be improved. Since the management of the MMA's social media is currently divided among a few people, some staff suggested posting should be one person's job. Additionally, staff liked the idea of a posting schedule. Baker, et. al. (2010) suggest businesses maintain a posting schedule in which they post on their social media pages around lunch and dinner time when most people have a break from their jobs. Jason Bridges, owner of the Handlebar Cafe, gave suggestions on how the MMA could improve its social media presence by allowing interns and staff to have access to Instagram stories to interact with the community and engage with current visitors (J. Bridges, personal communication, November 9, 2017). This aligns with the ideas from Kidd (2011), Baker et al. (2010), and Agresta et al. (2010), who say social media should be used by organizations to encourage interactions and build relationships with visitors. Like many other business and organizations, the Handlebar Cafe has guidelines for its use of social media. Posts must be visually appealing; have a positive message; and cover anything about coffee, the community, or Nantucket (as long as it ties back to the coffee shop). Since the MMA currently has no set guidelines, it could follow similar rules and relate the posts back to the MMA. Overall, the goals of social media should include increasing public awareness of the organization and increasing physical visitation to the organization's locations.

Additionally, Jason Bridges suggested longer posts are better because they will show up more in search and advertising algorithms resulting in more people seeing them, but posts should not be so long that viewers lose interest. According to Baker et al. (2010), sharing a series of posts in short succession, or "burst posting," is not a valid alternative to sharing one longer post. Followers of pages that burst post on these social media sites are likely to skim over many posts in a row by the same page, whereas one captivating post would grab their attention more

effectively. The Handlebar Cafe Instagram page also follows a "jab, jab, jab, right hook" posting strategy. Inspired by entrepreneur Gary Vaynerchuk, this strategy involves sharing a series of interesting posts to gain attention, and then building up to a special offer that potential visitors will be excited to capitalize on. Developing a set of guidelines can keep an organization's social media goals within sight.

The MMA's Website

The MMA's website currently uses an outdated format, created between 2012 and 2013, that is not user-friendly and does not meet the expectations of a contemporary website. The MMA's website (mariamitchell.org) contains all the information about the organization; however, the website uses an old model and needs to be updated. Many staff members commented on how it is not mobile-friendly which makes navigating the website on a mobile device difficult. There is also a simple Google My Map on the website with location pins (Figure 23).
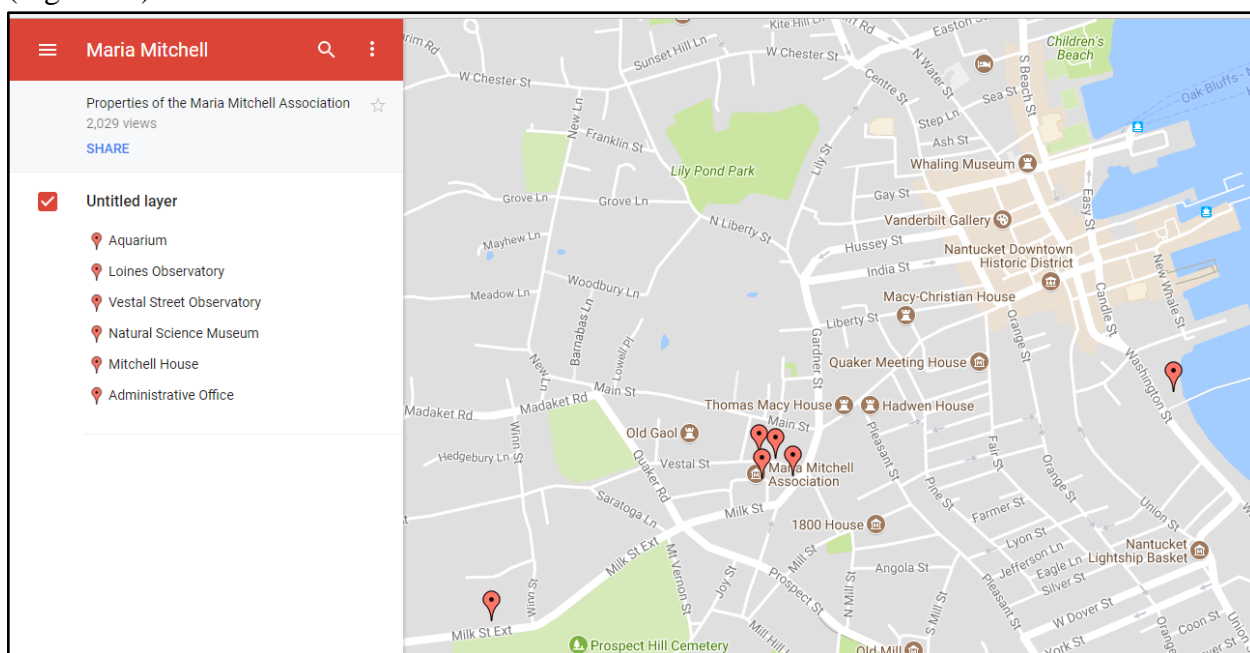
Figure 23: MMA's current Google My Map on their website

Interns and those working with the educational programs commented on how many people struggle with registering for programs online. Members have to select the program before logging in rather than logging in then choosing the program like most websites. Trinity Foreman, the MMA's Executive Administrator and Marketing/Event Coordinator, said the website uses strange terminology that confuses users, and it should be made easier to navigate on a more basic level (T. Foreman, personal communication, November 2, 2017). Additionally, she believes the calendar is the most up-to-date feature and should therefore be a larger, more integral part on the main page (T. Foreman, personal communication, November 2, 2017). If the calendar feature was made larger on the main home page, users would easily be able to see what events are currently happening and events they may be interested in going to.

The MMA on TripAdvisor

The MMA currently has three different pages on TripAdvisor: one for the Aquarium; one for Loines Observatory; and one for the MMA as a whole. Interviewees mentioned they looked at TripAdvisor before going to a new place in search for activities to do while they were there. Many staff members agreed feedback from visitors is important. Brianne Roth, former Nantucket Historical Association (NHA) Public Programs Coordinator, indicated the previous marketing staff member responded to all, good and bad, posts to show the NHA valued the feedback (B. Roth, personal communication, November 2, 2017). Jason Bridges, owner of Nantucket Bike Tours, said he made personal connections on bike tours then within the next day sent an email to all the bike riders, mentioned the personal connections, and then asked for TripAdvisor reviews and explained why the reviews are important to Nantucket Bike Tours (J. Bridges, personal communication, November 9, 2017). Currently, MMA staff members do not respond to all TripAdvisor reviews.

4.5 MMA Audience and Visitation Habits

The diverse nature of the MMA's offerings means it has diverse audiences with different interests and preferences. As shown in Table 3, MMA staff members say the Aquarium and Natural Science Museum see mostly families with children while the Mitchell House caters mostly, but not entirely, to adults, while the two observatories attract a wide range of visitors. The 24 responses to the survey sent out to MMA board members, staff, supporters, and members showed most respondents visited the Aquarium, Natural Science Museum, Vestal Street Observatory, and Mitchell House with their families at least once in the past year. As mentioned by the MMA's Director of Astronomy, there is a wide range of visitors at Loines Observatory. Survey responses show most respondents who visited Loines Observatory at least once in the past year went with families, friends, and partners. Different target audiences respond to marketing material differently with families showing more interest when exposed to images of children participating in fun and engaging activities. The Shipwreck and Life Saving Museum is an attraction owned by Egan Maritime Institute, three miles outside of the downtown area. Last year the Shipwreck and Life Saving Museum hosted a "Family Day" with free activities, and they found many people that went did not know it was "Family Day" or that it was free. Executive Director of Egan Maritime Institute Pauline Proch believed this increase in visitation was because they advertised differently by showing fun activities with kids rather than their usual ship logo or lead image for the exhibit (P. Proch, personal communication, November 9, 2017).

MMA staff and board members report the most visited places are the Aquarium and Loines Observatory, which are the farthest locations from the cluster of buildings on Vestal Street. The Aquarium is closer to the downtown area, so there is more pedestrian traffic. Loines Observatory hosts Open Nights in the evening, so it is not competing with other attractions such as the beach. In our interviews with MMA staff, a majority said the Vestal Street campus was the

least visited because it is not located in the downtown area, looks residential, competes with other museums in the downtown area, and competes with beach time.

Table 3: Audience Descriptions by staff for MMA facilities

Facility	Audience
Administrative Office	People who have trouble signing up online, parents with paperwork for programs.
Aquarium	Mostly families and children.
Loines Observatory	Wide range of audience: 3-4 is the youngest that can really use telescope to elderly (prior knowledge ranges from none to amateur astronomers and researchers).
Mitchell House	Mostly adults, occasionally families, some children, people who know about Maria Mitchell.
Natural Science Museum	Mostly families and children.
Vestal Street Observatory	Mostly adults

4.6 Organizational Image

From an outside perspective, the MMA appears disjointed and unorganized. The MMA did not have an executive director until the 1990s, which was nearly one hundred years after it was founded. Additionally, around 2014, there was a period of about one year where there was no executive director, and the board president served as an acting executive director. The MMA lacked central leadership during these periods, so the various departments operated independently in the past and are still fairly independent now. During the 2014 period without an executive director, the logo was altered several times and used inconsistently, with these inconsistencies remaining to this day. The use of multiple logos with slight variations can lead to visitors questioning the association's organization. With limited communication, the departments all have different opinions and ideas for how the organization should operate. Visitors may notice the differences between departments and may view the organization and its various departments as disjointed.

Some of the MMA's properties can appear unkempt and there is little uniformity of appearance between the buildings. The properties could be more visually appealing and look better maintained. Some need repairs and maintenance, such as replacing broken fence posts and

repainting, while others look messy and disorganized on the inside. This can make the MMA appear unprofessional and unappealing to potential visitors. The first impression the MMA makes on visitors is not reflective of everything it has to offer.

5. Conclusions and Recommendations

From our findings, we conclude that there is significant confusion surrounding the MMA's identity, which has been a source of many of its problems. With this in mind, we recommend the MMA determine how it wants to identify itself and solidify its brand around one identity. In this section, we discuss specific conclusions and recommendations for improving: branding; marketing collateral; signage; landscaping; social media; the MMA website; the MMA's presence on TripAdvisor; and the MMA's current maps. We discuss multiple options for recommendations where budget and resources are a concern, so the MMA can choose what it thinks are the best options financially.

5.1 Branding Recommendations

The MMA needs to choose a single visual identity to represent it and use this visual identity in a consistent manner on its marketing materials. Consistency within the brand is a necessity and can be accomplished by the recommendations presented in this section.

Logo

The MMA currently uses two logos, neither of which encompasses everything the MMA does or has to offer to its visitors. Continued use of two different logos will only cause confusion to visitors and further confound the MMA's identity. We recommend the MMA:

Decide on a single logo to use for all purposes.

One of the most important parts of this process will be to remove all instances of any other logo(s) used on marketing collateral, organization supplies, and the website. We suggest this decision be a collaborative discussion between board members and staff to make sure the end result satisfies all parties.

Create a new logo for the MMA.

A new logo that more clearly represents the MMA and its mission would help clarify the organization's identity. If a new logo is created, we recommend it encompass the entire organization and refrain from being too abstract. The logo should be created in such a way that it is:

- Printable and easy to use on all printed materials;
- Able to retain its appearance in a variety of sizes;
- Simple yet aesthetically pleasing; and
- Worthy of approval by the HDC.

It is important to consider the HDC's guidelines on signs when creating a logo because, for brand consistency, the signs and the logos should appear the same. Based on feedback from staff, the square logo featured in Figure 12 appeared to be a good starting point for a new logo. The text would need to be changed to say "Maria Mitchell Association," and it should be simplified slightly to make it more versatile (i.e., removing the strands of grass). The creation of a new logo would be a long and expensive process. Therefore, we want the MMA to consider this option as a long-term goal. We suggest the process of

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creating a new logo involve all staff and board members to make sure the end result satisfies all parties.

Marketing Materials and Collateral

The MMA's marketing materials and collateral suffer from a lack of consistency, and the organization lacks proper materials to advertise itself as a whole. Current practices also force the MMA to choose between throwing out collateral or using materials that are out of date or inaccurate. We recommend the following to the MMA:

Develop a new set of guidelines regarding the usage of the logo and the layout of flyers.

These guidelines would help to create a uniform appearance for the MMA marketing materials. Additionally, these guidelines need to be enforced and easily accessible to all staff members. These guidelines could be modified from the guidelines for the original version of the current logo, which were created in 2008.

Design a template for recurring flyers to ensure a uniform appearance.

To achieve this, we suggest the template lay out the position for the following:
- The title for the event/program;
- The MMA logo;
- The dates and times of the event.

The template should also establish a standard color palette. It is important to recognize that this template is only to give a baseline for any materials that need to be developed. Text and images can still be individualized to appropriately represent the event.

Design and print a brochure that represents the entire organization.

Develop and print a brochure that covers the entirety of the organization in just a few short pages. We worked with George Donnelly, the MMA's Director of Development and Communications, to develop a mock-up draft of such a brochure (see Appendix H). The version we created is a simple draft but includes all of the information MMA staff and board members believed should be included. This brochure should be placed at other locations in addition to the Programs Book. We also recommend the MMA place this brochure at the Hyannis ferry terminals.

Re-evaluate current printing practices for marketing materials.

It is important for the MMA to evaluate the frequency and size of print jobs. We suggest reducing the size of print orders to avoid a surplus of flyers. The only instance where this would not hold true would be when materials are developed that <u>do not</u> contain any information that would eventually become obsolete, such as:
- Dates;
- Prices;
- Names of employees;
- Other time sensitive information.

Brochures meeting these criteria would rarely become obsolete and could be used for many years.

5.2 Signage Recommendations

The MMA uses a variety of signage in various conditions from pristine to barely readable. There are multiple ways the MMA can improve its signage, and we have created three plans the MMA could follow in replacing its signage. Each plan has its pros and cons listed after the plan. They are as follows:

Plan 1: Replace worn out signs immediately with woodcut in the following order:

1. Loines Observatory
2. Historic Mitchell House
3. Sign on the corner of Milk Street and Vestal Street (Figure 24)
4. Hinchman House sign by front door
5. New sign for the Research Center
6. Replace all other signs as needed
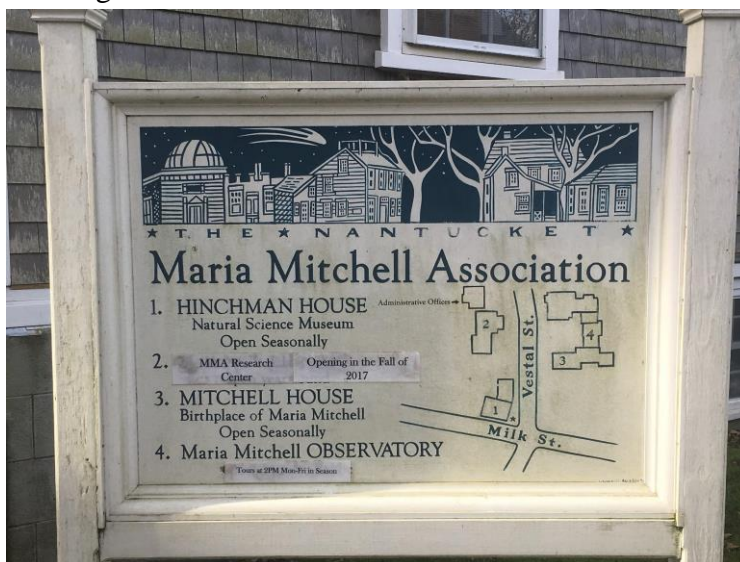
Figure 24: Current sign on the corner of Vestal Street and Milk Street

This plan would be the easiest for the MMA to implement because only five signs would need to be replaced immediately. Additionally, if a sign is new and appears exactly the same as the old sign, it does not need to go through the HDC approval process.

Plan 2: Replace all signs with new signs that look like the Aquarium and Science Center sign (Figure 16).

- All signs except for the sign at 33 Washington Street would need to be replaced
- When the Aquarium is relocated the original sign made for 33 Washington Street can be put up
- Cost estimates have been given by Paul McCarthy at Nantucket Carving and Folk Art (Appendix F)

This plan would require the MMA submit a master sign plan to the HDC and submit a separate sign application for each new sign.

Plan 3: Replace all signs with the current MMA logo (Figure 6).
- All signs except for the sign above the door at 33 Washington Street
- Signs would match marketing collateral and website.

This plan would require the MMA submit a Master Sign plan to the HDC and submit a separate sign application for each new sign.

To augment the cost estimates in Appendix F, the MMA could look into off-island sign makers for additional estimates. Appendix G has a cost estimate from Signs In Wood for the sign in Figure 24. The MMA could also consider asking its staff and board members if anyone is interested in painting the new signs, or it could be promoted as a high school art project. However, with these options, there is a risk in how professional the signs would look.

In addition to replacing worn out signage, the MMA needs to improve its signage at its facilities. Our recommendations are as follows:

Improve signage at Loines Observatory.

To help guests find the driveway at night we recommend adding the same red LED lights that guide people up the stairs at night to the two posts at the edge of the driveway. This will make the driveway easier to locate and not disrupt the viewing of the night sky. In addition, we recommend adding signage at the edge of the street. The following are options the MMA can pursue:
- Use a hanging sign similar to the Aquarium Sign (Figure 15);
- Use a post sign similar to those used by the Nantucket Land Bank (Figure 22);
- Use rock signage (Figure 21).

Each of these options has pros and cons regarding how well it will conform to other MMA signage and the likelihood it will be approved by the HDC. A hanging sign would be able to match MMA signage well, but is unlikely to be approved by the HDC. The post signage would be able to resemble current MMA signage, and the HDC may or may not approve it based on the opinion that this type of signage is meant for open areas. The rock signage would not match other MMA signage well, but has a high chance of being approved by the HDC.

Improve organization of notice boards.

We suggest the notice boards use a magnetic backing to maintain a clean and tidy appearance, and flyers be maintained in a neat fashion. We recommend they be organized in order of occurrence (i.e. the most upcoming event first followed by the next upcoming event, and ending with farthest upcoming event from the current date) from left to right. We urge that the noticeboards be updated at least once a week to ensure no flyers are left up after an event has occurred. This process should also involve shifting the flyers down in position to maintain the order of upcoming events. We also recommend including a laminated map inside the notice boards.

We suggest the map include the following features:

- The location of the notice board (i.e. "You are here.");
- All facilities, addresses, and phone numbers; and
- The website address (mariamitchell.org).

These features will assist potential visitors in navigating to the MMA and understanding the MMA's offerings.

Replace notice board in front of Research Center.

This notice board would be "grandfathered in" according to HDC regulations because it was built before 1990. The usage of this noticeboard should follow the guidelines above.

Include a plaque with a more in depth description of Maria Mitchell in front of the Vestal Street Observatory by the fence.

This plaque could be similar to the information plaques in front of the Whaling Museum (Figure 25) and would serve to inform pedestrians who walk by.

Figure 25: Plaque outside Whaling Museum to explain the carving on the building

Use the firebox as a way to inform possible visitors.

Keep the information box stocked with brochures, and cut back the hedges so the information box is more visible.

5.3 Landscaping Recommendations

The MMA landscaping can look unkempt at times and needs to be improved. We have created a list of options the MMA can consider to improve the current landscaping at its facilities.

Plant a specific type of flower or bush at each of the locations.

We recommend the MMA include a specific type of plant at each of its locations to improve the visual unity of its properties. The MMA could plant blue flowers because it is one of the organization's major colors. Appendix I shows all of the options for blue flowers we believe are potentially useful, as well as the pros and cons of each. From this table, we suggest the MMA plant Cranesbill Geraniums at each facility based on its benefits listed in Table 4.

Table 4: Cranesbill Geranium with relative information, pros, and cons

Picture	Name; Price; Blooming Period	Pros	Cons
	Cranesbill Geranium; $3.33/plant; April-October	-Native to Nantucket -Low-maintenance -Perennial -Attract butterflies -Large flower, bright colors	-Sometimes more purple than blue -Expensive

Maintain a crisp and clean appearance at each location.

Ensure the vegetation at each facility is trimmed back and maintained, especially at Loines Observatory, where overgrown vegetation currently blocks the view of the sign from the street and disables visitors from sitting on a bench. Other recommendations for presenting the MMA with a crisp appearance include repainting the trim of the buildings when the paint begins to chip or peel away and having staff or a landscaper watering and maintaining the plantings outside of the buildings.

Emphasize the importance of native vegetation to visitors.

The native vegetation such as milkweed outside of MMA facilities can give them an unkempt appearance, so we recommend the MMA emphasize the significance of these plantings to visitors. This can be done with:
- An exhibit about native plantings in the Natural Science Museum;
- A small plaque on the fences by the plantings; and
- Brochures that educate visitors about native vegetation and plantings.

These are all ways to explain the perhaps perceived unkemptness of the MMA's facilities to visitors and passing pedestrians alike.

Include benches and picnic tables at all locations.

Benches and picnic tables can help distinguish public buildings from residential buildings, so we recommend the MMA include them at all of its facilities (Appendix J). Additionally, these features provide those with physical disabilities the chance to sit

down and rest. Benches and picnic tables can be funded by donations similar to the benches outside the Whaling Museum (Figure 26).

Figure 26: Donated bench outside the Whaling Museum

Install uniform fencing at all locations.

The use of uniform fences would create a visual unity for the MMA facilities, thus helping visitors recognize that each separate location is part of one organization. As this is an expensive recommendation and many of the fences are still in good condition, this should be considered a <u>long-term</u> goal.

Architecture should not be overlooked as a solution to wayfinding and identification for the MMA. The buildings have to remain residential, but other architectural features that do not change the appearance of the buildings themselves exist to improve wayfinding and identification for visitors.

5.4 Management of Online Resources

While the MMA has improved its online presence, there is still work to be done. Based on the information gathered during our interviews, we have created a list of conclusions and recommendations for the MMA's social media pages, website, and TripAdvisor pages.

Social Media Guidelines

The MMA's social media presence has been growing considerably over the past few years. However, there are still areas where the MMA can improve its social media to better engage visitors. Our full list of social media recommendations is in Appendix K. We recommend the MMA:

Develop a set of social media goals and relevant principles that help to achieve these goals.

The goals created are at the MMA's discretion, but we recommend these goals have the ultimate objective of increasing public awareness of its mission and increasing visitation to all of its locations. The principles are essentially standards to help achieve the larger goals. We recommend the MMA adopt the following as basic principles:

- Posting at either lunchtime (12PM) or dinnertime (6PM);
- Avoiding "burst posting," or sharing a series of posts within rapid succession of one another;
- Following a "jab, jab, jab, right hook" marketing strategy;
- Writing all posts with a positive message;
- Posting only high quality content, especially photos; and
- Captioning posts with longer descriptions so the advertising and search engine algorithms can detect more words and share the posts with more people.

The principles do not need to be limited to these, and we encourage the MMA to develop additional principles to fit the goals it develops. We suggest the MMA maintain and update the lists of goals and principles as it sees fit. Most importantly, these guidelines should be written out and easily accessible by anyone who may be posting to the MMA's social media pages.

Establish what type of information is shared on each social media platform.

Each social media platform is conducive to certain types of communication, be it sharing intriguing science articles or interesting pictures. We recommend the MMA use the following designations for posting its content:

- Twitter should be used mainly for sharing articles and events;
- Instagram should be used for posting aesthetically pleasing pictures relating to events that have happened or are upcoming;
- Facebook should be used to advertise events, share articles relevant to the MMA's mission, and publish photo albums from events.

Designate a single person to maintain social media posting.

Choosing one person to be in charge of posting on social media ensures the content is consistent both between posts on the same platform and across all platforms. This is important to maintain a positive appearance online.

Website Improvements

The MMA's website currently uses an outdated format that should be improved for ease of use via contemporary website design. We recommend the MMA make the following upgrades to its website:

Redesign the website to be mobile-friendly.

Users can be frustrated by the need to zoom in to properly see the page and accidently navigating to other pages. If the current website plugins do not allow the MMA to make the website mobile-friendly, we recommend it update its website model.

Reorganize the website to improve ease of navigation.

Anytime a user has to backtrack or is unable to find a page on the website can cause frustration and prevent people from signing up for programs. Prompt users to login prior to choosing a program to sign up for to avoid confusion. The fewer clicks to get to a certain page, the better.

Make the calendar feature more prominent on the main home page.

The MMA calendar is the most up-to-date feature on the MMA website. We recommend the MMA make the calendar feature a larger feature on the main home page, so users can easily see what programs and events are being provided for a particular week or month.

Replace the logo with the newest version.

The logo on the website is outdated and needs to be replaced with the logo on all the marketing material, so the MMA will appear more uniform.

TripAdvisor

The MMA has an opportunity to better utilize TripAdvisor as a tool to increase visitation at all of its facilities. Gathering the views of visitors is important for an organization like the Maria Mitchell Association. In order for the MMA to increase the number of reviews and improve the quality of the reviews on TripAdvisor, we recommend:

Connect with guests and actively manage the MMA TripAdvisor pages.

Staff and interns must attempt to create more personal connections with guests and then ask if visitors are willing to leave a review. It is also important to respond to both good and bad reviews on TripAdvisor because it shows the organization cares about the guest's experience. Although the MMA is limited in staff, it is important to maintain a connection with past visitors to increase visitation in the future.

Add the TripAdvisor logo to the MMA's brochure.

This can be a subtle reminder to guests that they can leave a review without the staff or interns having to ask. The MMA would have to get TripAdvisor's approval to use the TripAdvisor logo on its brochure. The process is explained in Appendix K: Social Media Guidelines in the TripAdvisor Section.

5.5 Improving Wayfinding and Visitor Interest

Maps are one of the most popular wayfinding tools. We recommend the MMA develop a better paper map and digital map for its visitors. The paper map would be readily available at all of the MMA facilities to help direct visitors from one building to another. The digital map would be provided on the MMA website and would be accessible on both a computer and mobile device. The following sections provide more detail into how the MMA may accomplish these recommendations.

Google My Map

The current Google My Map on the MMA's website (Figure 23) is quite simple and in certain places out of date. We suggest the MMA:

Update its current Google My Map and continue to maintain and refine it.

We have developed a working version (Figure 27) with several additional features such as descriptions and pictures of locations. We suggest the MMA replace its current version on the website with this map. Additionally, it is important for the MMA to continue to update the descriptions of the buildings as locations open and close for the season. We created a manual to guide the MMA staff through the process of updating the Google My Map which is a stand-alone document and can be found on the 2017 WPI Nantucket Project Center webpage (http://wp.wpi.edu/nantucket/projects/2017-projects/).
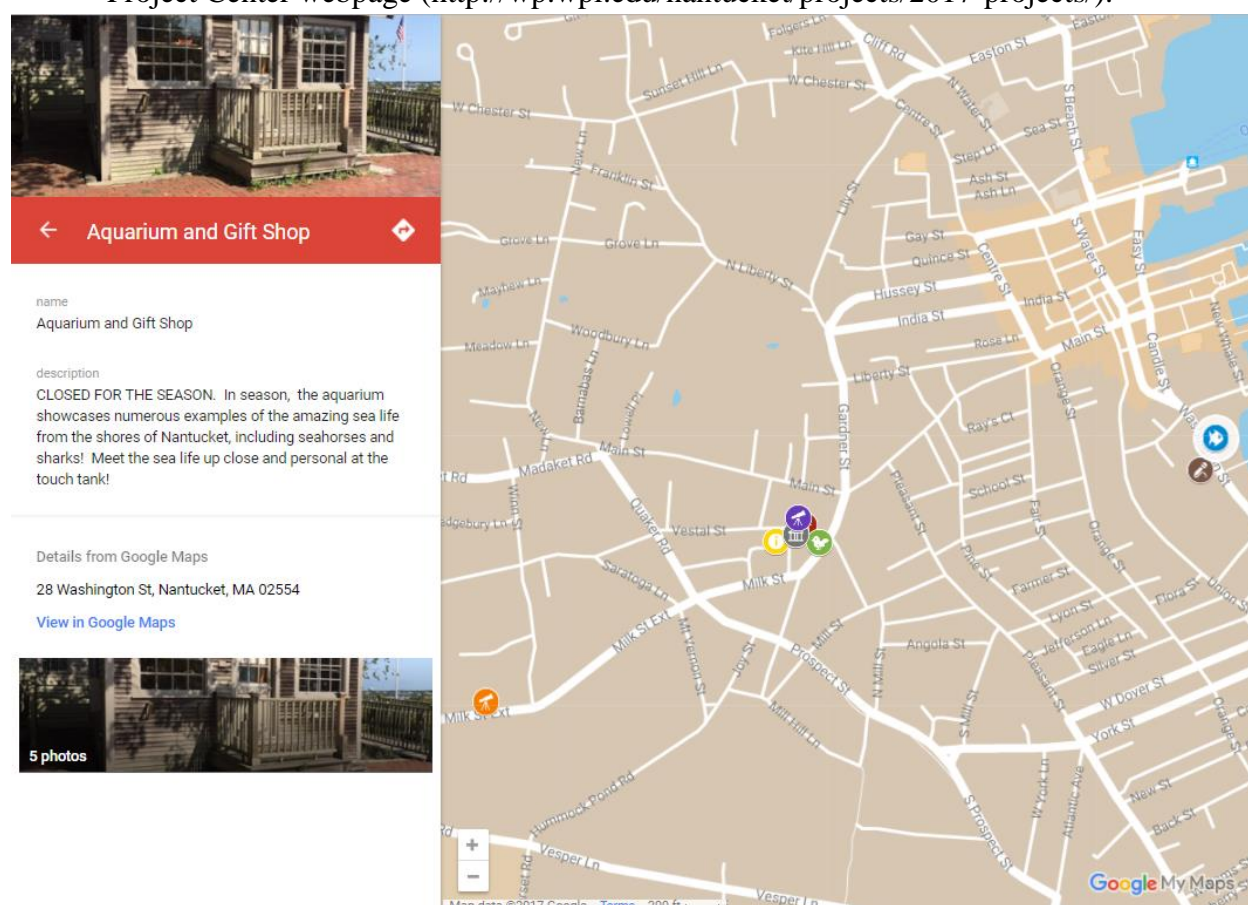
Figure 27: Prototype Google My Map with pictures and description of the Aquarium

Increasing Visitation to Vestal Street Campus

The Vestal Street campus (i.e., the Mitchell House, Hinchman House, Research Center, Vestal Street Observatory, and the Administration Building) is more difficult for visitors to find and has lower visitation numbers compared to Loines Observatory and the Aquarium. To increase admission numbers, we have a few recommendations for the MMA:

Create a self-guided walking tour to guide visitors from the Aquarium to the Vestal Street campus or vice versa.

This self-guided walking tour could take two forms: (1) a simple brochure with pictures and descriptions of points of interests or (2) an audio tour coupled with a brochure. This walking tour would include points of interest related to Maria Mitchell along the way. Figure 28 is a map of all the potential points of interest relating to Maria Mitchell between the Aquarium and the Mitchell House.

Walking tour locations

- Maria Mitchell's Birthplace
- Nantucket Atheneum
- Pacific National Bank
- Aquarium
- Quaker Meeting House
- The Methodist Church
- Southern Meridian Stone
- Northern Meridian Stone
- Unitarian Universalist Church
- Coffin School
- Mitchell's Book Corner
- Town Building
- Fire Stone
- Wall
- Quaker Starbuck House
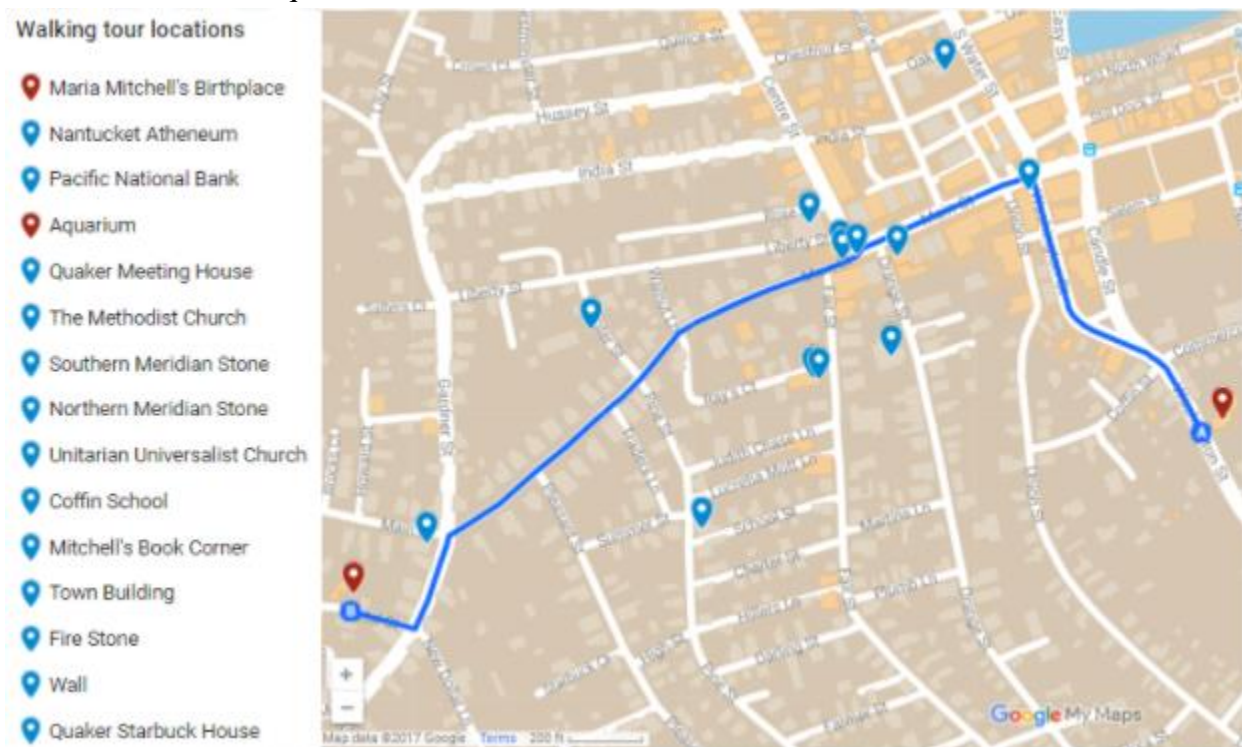
Figure 28: Possible walking tour points of interest that relate to Maria Mitchell between the Aquarium and the Mitchell House.

Provide tear-off paper maps at all facilities.

Because not all visitors may be comfortable using their mobile devices to navigate and may prefer a paper map, we suggest the MMA provide tear-off maps at all of its locations to give to visitors.

Create a social media game.

The MMA could also use social media, such as Instagram, to create a game where visitors have to take pictures at all of its locations, provide a fun fact they learned, use a specific hashtag, and receive a prize at the end. This could also increase the awareness of the MMA on other people's social media pages because their followers would see the fun and engaging activities the MMA offers.

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Better promote MMA facilities using an overarching brochure.

An overarching brochure (see example in Appendix H) can be used at MMA events that are not included as part of the property pass[3]. Loines Observatory could provide the brochure at the Open Nights' admissions table. Similarly, this brochure could be used at other events, such as the Speaker Series, to encourage guests to go to the other facilities the next day.

5.6 Closing Remarks

The MMA is a rare treasure on Nantucket that provides visitors with a variety of opportunities to learn about science and the history of Maria Mitchell. A small number of staff handle a wide range of tasks and are very busy. As a result, staff members do not have a lot of time to communicate with each other. This lack of communication is detrimental to the organization. We recommend the MMA work to unify its departments and increase the levels of communication and cooperation between them by following all guidelines created for the organization. Although there are a variety of wayfinding and organizational identity challenges to address, we hope the recommendations in this report will help the MMA clarify its identity and improve visitor wayfinding.

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[3] The property pass allows visitors to buy one pass and get into the Aquarium, Mitchell House, Hinchman House, and Vestal Street Observatory.

References

Agresta, S., & Bough, B. B. (2010). *Perspectives on social media marketing*. Nelson Education. Retrieved November 11, 2017, from https://ebookcentral-proquest-com.ezproxy.wpi.edu /lib/wpi/reader.action?docID=3136366

Anous, I. H. I. (2015). Applying Universal Design concept in interior design to reinforce the Social dimension of Sustainability. American International Journal of Research in Humanities, Arts and Social Sciences, 12. Retrieved from https://issuu.com/iasir/docs/hass_issue_10_vol1_print

Baker, J., Adler, L. R., Sillars, R., Ebook Central - Academic Complete, & Safari Books Online. (2010). *Online marketing and social media* (Guide (Instructor's) ed.). Independence; Boston;: Course Technology. Retrieved November 11, 2017, from https://ebookcentral-proquest-com.ezproxy.wpi.edu /lib/wpi/reader.action?docID=3136342#

Basiri, A., Amirian, P., & Winstanley, A. (2014). The use of quick response (QR) codes in landmark-based pedestrian navigation. *International Journal of Navigation and Observation, 2014*, 1-7. doi:10.1155/2014/897103

Bernstein, S. (2015, February 4). The Realities of Installing iBeacon to Scale [Web blog post]. Retrieved October 27, 2017, from https://www.brooklynmuseum.org/community/blogosphere/2015/02/04/the-realities-of-installing-ibeacon-to-scale/

Boukhechba, M., Bouzouane, A., Gaboury, S., Gouin-Vallerand, C., Giroux, S., & Bouchard, B. (2017). A novel bluetooth low energy based system for spatial exploration in smart cities. *Expert Systems with Applications, 77*, 71-82. doi:10.1016/j.eswa.2017.01.052

Bowie, D., Buttle, F., Brookes, M., & Mariussen, A. (2016). *Hospitality Marketing*. Oxfordshire, UK: Taylor & Francis, 228.

Calori, C. & Vanden-Eynden, D. (2015). *Signage and Wayfinding Design: A Complete Guide to Creating Environmental Graphic Design Systems* (p. 6). Hoboken, New Jersey: John Wiley & Sons Inc.

Devlin, A. S. (2014). Wayfinding in healthcare facilities: Contributions from environmental psychology. *Behavioral Sciences (Basel, Switzerland), 4*(4), 423-436. doi:10.3390/bs4040423

Gibson, D. (2009). Wayfinding handbook: Information design for public places. Princeton Architectural Press. Retrieved from http://ebookcentral.proquest.com.ezproxy.wpi.edu

Hayward, D. G., & Brydon-Miller, M. L. (1984). Spatial and conceptual aspects of orientation: Visitor experiences at an outdoor history museum. *Journal of Environmental Systems*, *13*(4), 317-332. doi: 10.2190/C82H-885M-U8R7-YJK4

Hergan, I., & Umek, M. (2016). Comparison of children's wayfinding, using paper map and mobile navigation. *International Research in Geographical and Environmental Education, ,* 1-16. doi:10.1080/10382046.2016.1183935

Historic New England. (2017). Architectural Style Guide: How to tell Greek Revival from Colonial Revival and more. Retrieved from https://www.historicnewengland.org/preservation/for-homeowners-communities/your-old-or-historic-home/architectural-style-guide/

Huang, H., Schmidt, M., & Gartner, G. (2012). Spatial knowledge acquisition with mobile maps, augmented reality and voice in the context of GPS-based pedestrian navigation: Results from a field test. Cartography and Geographic Information Science, 39(2), 107-116. http://dx.doi.org/10.1559/15230406392107

Ishikawa, T., Fujiwara, H., Imai, O., & Okabe, A. (2008). Wayfinding with a GPS-based mobile navigation system: A comparison with maps and direct experience. *Journal of Environmental Psychology, 28*(1), 74-82. doi:10.1016/j.jenvp.2007.09.002

Jang, H. C., & Lien, Y. N. (2014, April). Educational Exhibition System and the Application of APP on Museum Mobile Learning–National Palace Museum as an Example. In International Conference on e-Commerce, e-Administration, e-Society, e-Education, and e-Technology. Nagoya University.
Retrieved From http://cherry.cs.nccu.edu.tw/~lien/Pub/c109NPMapp.pdf

Kelly, L. (2009). The Museum's Social Strategy. *The Australian Museum*. Retrieved from https://australianmuseum.net.au/blogpost/museullaneous/the-museums-social-media-strategy

Kennedy-Eden, H., & Gretzel, U. (2012). A taxonomy of mobile applications in tourism. *E-Review of Tourism Research, 10*(2), 47-50.

Kidd, J. (2011). Enacting engagement online: Framing social media use for the museum. Information Technology & People, 24(1), 64-77. doi:10.1108/09593841111109422

Kobayashi, K., Lee, R., & Sumiya, K. (2010). Pros and cons of utilizing mobile navigation systems in pedestrian way finding. Paper presented at the 395-400. doi:10.1109/WAINA.2010.89

Lewi, H., & Smith, W. (2011). Hand-held histories: Using digital archival documents on architectural tours. *Arq: Architectural Research Quarterly, 15*(1), 69-77. doi:10.1017/S1359135511000376

MacLeod, S., Dodd, J., & Duncan, T. (2015, July 3). New museum design cultures: Harnessing the potential of design and 'design thinking' in museums. *Taylor and Francis Online, Museum Management & Curatorship, 30*(4). doi: 10.1080/09647775.2015.1042513

Martin, B. J. (2006). *Wayfinding 101: Signage planning for a college campus. Sign Builder Illustrated, 19*(128), 48-50,52-53,10. Retrieved from http://ezproxy.wpi.edu/login?url=https://search.proquest.com/docview/213742875?accountid=29120

McClead, K. (2014). *Design + wayfinding plan: Hanover county's historic assets,* p. 16. Retrieved from http://www.murp.vcu.edu/projects762/S14/S14_KMcClead_Design_plus_Wayfinding_Hanover_County.pdf

Merje (2014). *Portsmouth, NH: Wayfinding Analysis,* p. 1.1.Retrieved from
     http://www.planportsmouth.com/Portsmouth_FINALAnalysis_041414_lowres.pdf

Miletsky, J. I. & Smith, G. - Academic Complete. (2009). Perspectives on branding (1st ed.).
     Boston, Mass: Course Learning.

Moses, M. (2015). Rebranding the Museum Experience. *American Craft Council*. Retrieved
     from https://craftcouncil.org/post/rebranding-museum-experience

Museums + Heritage Advisor. (2017). Royal Museums Greenwich unveils new identity and
     brand strategy. Retrieved from http://advisor.museumsandheritage.com/news/royal-
     museums-greenwich-unveils-new-identity-brand-strategy/

Nantucket Historic District Commission. (2017, June). The sign book: Regulations and
     guidelines for signs on Nantucket Island. Retrieved from
     http://www.nantucket-ma.gov/DocumentCenter/Home/View/14445

Nelson, L. (1988, September). Architectural Character—Identifying the Visual Aspects of
     Historic Buildings as an Aid to Preserving their Character. *U.S. National Park Service*.
     Retrieved from https://www.nps.gov/tps/how-to-preserve/briefs/17-architectural-
     character.htm

New York City Department of City Planning (NYCDCP). (2013). Active Design: Shaping the
     Sidewalk Experience. *City of New York*. Retrieved from
     https://www1.nyc.gov/assets/planning/download/pdf/plans-studies/active-design-
     sidewalk/active_design.pdf

Orbaşlı, A., & Shaw, S. (2007). Transport and visitors in historic cities. *Tourism and Transport*.

Passini, R. (1996). Wayfinding design: logic, application and some thoughts on universality.
     Design Studies, 17(3), p. 322. https://doi.org/10.1016/0142-694X(96)00001-4

Pati, D., Harvey, T. E., Willis, D. A., & Pati, S. (2015). Identifying elements of the health care
     environment that contribute to wayfinding. *HERD: Health Environments Research &
     Design Journal, 8*(3), 44-67. doi:10.1177/1937586714568864

Pérez-Sanagustín, M., Parra, D., Verdugo, R., García-Galleguillos, G., & Nussbaum, M. (2016).
     Using QR codes to increase user engagement in museum-like spaces. *Computers in
     Human Behavior, 60*, 73-85. doi:10.1016/j.chb.2016.02.012

Plimoth Plantation. (2011). Accessible & Educational: Plimoth Plantation Opens New Pathway
     to Learning [Press release]. Retrieved from
     http://www.plimoth.org/sites/default/files/wysiwyg-
     images/2011%2BNew%2BPathway%2BFinal.pdf

Seegers, J., & Giordano, A. (2015). Cartographic Constructs: A Case Study of Nantucket Island
     Oral Histories. *The Professional Geographer*, *67*(4), p. 542.
     http://dx.doi.org/10.1080/00330124.2015.1053835

Smithsonian Institution Office of Policy and Analysis. (2001). Audience Building: Marketing
     Art Museums. *Smithsonian Institution*. Retrieved from
     https://www.si.edu/Content/opanda/docs/Rpts2001/01.10.MarketingArt.Final.pdf.

University of Buffalo School of Architecture and Planning. (2001). Universal Design New York:
4.1c Wayfinding. *University of Buffalo*. Retrieved from
http://idea.ap.buffalo.edu/udny/section4-1c.htm

University of Washington. (2015). *University of Washington wayfinding*. Retrieved from
https://cpd.uw.edu/sites/default/files/do/old/opb/Architecture/AC/2015-06-29/
UWAC%202015-06-29%20%20UW%20Wayfinding%20%26%20Signage.pdf

Appendix A: Gantt Chart of Project Timeline

MMA	October										November																														December															
Objectives/Tasks	Week 1							Week 2							Week 3							Week 4							Week 5							Week 6							Week 7							Week 8						
	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Evaluate Wayfinding/Identification																																																								
Continue Literature Review	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█								█	█	█	█																	
Perspectives of Key Stakeholders																																																								
Draft Interview Script	█	█	█	█	█	█	█																																																	
Revise Script								█	█	█	█																																													
Interview Key Stakeholders											█	█	█	█	█	█	█	█	█	█	█	█	█																																
Review Notes											█	█	█	█	█	█	█	█	█	█	█	█																																	
Draft MMA Survey	█																																																						
Revise Survey		█	█	█	█	█	█																																																
Conduct Survey								█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█																																
Analyze Data																						█	█	█	█	█	█	█	█	█	█	█	█	█																					
Collect Previous Feedback	█	█	█	█	█	█	█																																																
Evaluate Constraints																																																								
Compile a List of Limitations											█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█																					
Identify Solution Costs															█	█	█	█	█	█	█	█	█																																	
Propose a Plan																																																								
Iterative Reviews																					█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█						
Exit Meeting																																																		█	█	█	█	█	█	█
Presentation																																																		█	█	█	█	█	█	█
Final Report																																																		█	█	█	█	█	█	█

Appendix B: Interview Protocol

Preamble/Introduction: We are a team of WPI students working with the Maria Mitchell Association to improve wayfinding and identity on their campus. You are not obligated to answer any question asked, and you may stop the interview at any time if you do not wish to continue. We would like to record this interview so we may refer back to it later; if you prefer not to be recorded, we will just take notes. May we record this interview? If any of your responses are included in our final report or presentation, we will send you the content for you to review, and you may change or remove the content as you see fit. May we proceed with the interview?

General Script Questions:
- What is your organization's relationship with the MMA?
- What experiences has your organization had regarding brand recognition/identity? Do you use maps/brochures/mobile apps/other references to assist your visitors?
- What is the most cost efficient solution to identity/wayfinding problems you have used?
- As a business, what experiences have you had in being limited by the Historic District Commission's guidelines?
- Do you have any recommendations on who we should talk to about this topic?
- Do you have any other concerns/advice regarding our project?

Wayfinding:
(Wayfinding is the process of navigating between locations. There are many different techniques and tools intended to make wayfinding in unfamiliar locations easier.)
- What have you done to address any wayfinding problems in the past?
- Have you found any technology to be specifically useful in wayfinding?
- What buildings, do you think, are hardest for visitors to find?
- What wayfinding issues have you experience between your many locations?
  - Largest/most prevalent in your opinion and why?
- Do you use QR codes to assist with wayfinding?
  - If so, where?
  - If not, have you ever considered using QR codes to assist visitors (ie. Brings up a map of all the organization's buildings)?
- How has your organization addressed the signage and architectural limitations enforced by the Historic District Commission?

Identification/Branding/Marketing:
- Has your organization had any problems with identity/branding?
- What have you done to address any identity/brand recognition problems in the past?
  - Were any successful?
  - Were any unsuccessful?

- What is your opinion on only selling one pass to all buildings as a business model?
  - Should single building pass or multi-building pass be sold?
  - Do you think visitor attendance at all buildings would increase if passes were stamped every time a visitor went to a different building?
- Do you think your "all access" pass has increased attendance at some/all of your locations?
- How important is the landscaping/visual appeal of a building?
- Do you use QR codes to assist with identity (ie. giving more information about the organization/building/exhibit)?
  - If so, where?
  - If not, have you ever considered using QR codes to assist visitors?
- Has your organization ever gone through a rebranding phase, such as introducing a new logo?
  - What were your motives for rebranding?
  - How did you settle upon the new brand/logo?
  - Did a third party assist you in the rebranding process? If so, who?

Appendix C: Stakeholder Interviewees

Maria Mitchell Association
- David Gagnon (Executive Director)
- Jascin Finger (Deputy Director & Curator of the Mitchell House, Archives, and Special Collections)
- Dr. Regina Jorgenson (Director of Astronomy)
- Dr. Emily Goldstein Murphy (Director of Natural Science)
- Trinity Foreman (Executive Administrator & Marketing/Event Coordinator)
- Shelley Dresser (Associate Director of Development & Special Projects)
- Kim Botelho (Director of Education)
- George Donnelly (Director of Development and Communications)
- Elisabeth Sorrows (Past Intern)
- Kara Falcks (Past Intern)
- Deb Manus (Board Member - President)
- Helene Weld (Board Member - Vice President)
- Toni McKerrow (Board Member - former President)
- Judy MacLeod (Board Member)
- Malcolm McNab (Board Member)

The Nantucket Historical Association
- Brianne Roth (former Public Programs Coordinator)

ReMain Nantucket
- Virna Gonzalez
- Rachel Hobart

Egan Maritime Institute
- Pauline Proch (Executive Director)
- Lisa Lazarus (Assistant Director/Curator)

The Office of Culture and Tourism
- Janet Schulte (Director/former Executive Director of MMA)
- David Sharpe (Visitor Coordinator)

The Sign Advisory Committee of the Historic District Commission
- Chris Young

Architect on Nantucket
- Mickey Rowland

Others, including local businesses, involved in wayfinding and identification on Nantucket
- Jason Bridges (owner of Handlebar Cafe, Nantucket bike tours)
- Paula Leary (NRTA)
- Harvey Young (owner of Young's Bicycle Shop)
- Kitty Pochman (Executive Director of Linda Loring Nature Foundation, former Executive Director of MMA)

Appendix D: Member Survey

Maria Mitchell Association Survey

We are a project team from Worcester Polytechnic Institute conducting a research project in collaboration with the Maria Mitchell Association (MMA). Our goal is to improve wayfinding and identification at the MMA. As a member of the MMA, your opinions on these subjects are particularly important. This survey is anonymous and the data we collect will only be presented in aggregate in the final report. None of the questions are mandatory. If you have any questions you are welcome to contact us at ACK17MMA@wpi.edu.

Which best describes your residency on Nantucket?

○ Year-round resident

○ Seasonal resident

○ Summer vacationer (less than one month)

○ Summer vacationer (more than one month)

○ Other: _____

How many times have you visited each location in the past year? (On some devices you may need to scroll to the side to see all available responses)

	Zero times	Once	Twice	Three times	More than three times
Aquarium	O	O	O	O	O
Loines Observatory	O	O	O	O	O
Vestal Street Observatory	O	O	O	O	O
Natural Science Museum	O	O	O	O	O
Mitchell House	O	O	O	O	O

How does the location of buildings and the distance between them affect your visit?

Your answer

Who do you visit the MMA with most often?

○ Family/Children

○ Partner

○ Friend(s)

○ Nobody (Go Alone)

○ Other: _____

How would you describe the MMA to someone who has not visited it before?

Your answer

Below are images of the woodcut sign used outside MMA buildings and the MMA logo used on printed material. Do you think the use of two different images causes confusion for visitors?

○ Yes

○ No

○ Not sure

○ Other: _____

Woodcut Sign

MMA Logo

If you were visiting an unfamiliar location similar to the MMA, what would be your preferred methods of navigation? (Choose all that apply)

- ☐ Paper map/brochure

- ☐ Digital map

- ☐ Asking for directions

- ☐ Guided tour

- ☐ Audio tour

- ☐ Exploring without any particular directions

- ☐ Other: _____

Are you familiar with QR codes?

(This is a QR code)

○ Yes

○ No

○ Not sure

Note that if the user selects "No" the "QR Code Questions" section will be skipped.

QR Code Questions

Is your phone able to scan QR codes?

○ Yes

○ No

○ I'm not sure

How likely are you to scan a QR code for more information about something you are interested in?

	1	2	3	4	5	
Not at all likely	○	○	○	○	○	Very likely

This is the end of the QR Code Questions section.

How likely are you to type a web address (i.e. mariamitchell.org) into your phone for more information about something you are interested in?

	1	2	3	4	5	
Not at all likely	○	○	○	○	○	Very likely

What year were you born?

Your answer

Appendix E: Sign Inventory

Location:	Outside Aquarium, 28 Washington St.
Construction:	Solid wood
Dimensions:	24" x 22 ⅝" x 1 ½" (¼" bevel on all edges)
Type:	Freestanding sign, supported by 2 eye-hooks
Condition:	GOOD (does not need to be replaced or restored)
Comments:	Recently replaced for free by Nantucket Wood Carving & Folk Art after the old sign was stolen.

Location:	On Drake Cottage, 4 Vestal St.
Construction:	Marine plywood
Dimensions:	35 ¾" x 23 ⅞" x ⅞" (¼" trim on all sides)
Type:	Wall sign, attached with 4 screws
Condition:	GOOD (does not need to be replaced or restored)
Comments:	

Location:	By front door of Hinchman House, 7 Milk St.
Construction:	Marine plywood
Dimensions:	30" x 20" x ½" (trim is damaged and inconsistent)
Type:	Wall sign, attached with 4 screws
Condition:	FAIR (should be replaced or restored moving forward)
Comments:	Sign is a bit worn out and difficult to read. Quarterboard: 20" x 3" x ⅛", attached with 2 screws, horizontally centered

Location:	By back door of Hinchman House, 7 Milk St. (visible on Vestal St.)
Construction:	Marine plywood
Dimensions:	30" x 20" x ½" (¼" trim on all sides)
Type:	Wall sign, attached with 4 screws
Condition:	GOOD (does not need to be replaced or restored)
Comments:	Quarterboard: 20" x 3" x ⅛", attached with 2 screws, horizontally centered

	Location:	Deck of Loines Observatory, 59 Milk St. Ext.
	Construction:	Marine plywood
	Dimensions:	46" x 22" x 7/16" (¼" trim on all sides)
	Type:	Fence sign, attached with 4 screws
	Condition:	POOR (needs to be replaced or restored)
	Comments:	Very worn out, as it has high sunlight exposure. Far from street and behind hedges, making it difficult to read. Relocation of the sign closed to the street should be considered.

	Location:	Mitchell House, 1 Vestal St.
	Construction:	Marine plywood
	Dimensions:	30" x 18" x ½" (¼" trim on all sides)
	Type:	Wall sign, attached with 4 screws
	Condition:	POOR (needs to be replaced or restored)
	Comments:	Very worn out, as it has high sunlight exposure. Paint is chipped away on the left side of the sign. Quarterboard: 20" x 1 ¾" x ⅛", attached with 2 screws, horizontally centered
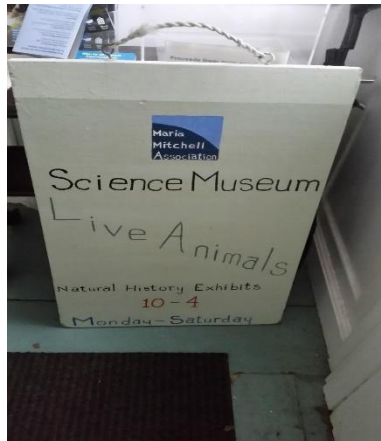
Location:	Vestal St. Observatory, 2 Vestal St.
Construction:	Metal
Dimensions	N/A
Type:	Wall sign, set into brick
Condition:	GOOD (does not need to be replaced or restored)
Comments:	Old sign grandfathered in by the HDC. Does not match the other MMA signs, but should not be replaced or removed.

Location:	Washington St. Facility side entrance, 33 Washington St.
Construction:	Solid wood
Dimensions:	18 ⅛" x 18 ⅛" x 1 ¾" (⅜" bevel on all edges)
Type:	Projecting sign, supported by 2 eye-hooks
Condition:	FAIR (should be replaced or restored moving forward)
Comments:	Old version of the new contemporary logo. White lettering is starting to fade. Doesn't match the other MMA property signs.

Location:	Civil War Monument, on the corner of Milk St. and Main St.
Construction:	Solid wood, plexiglass (display case)
Dimensions:	N/A
Type:	Fence sign, noticeboard
Condition:	GOOD (does not need to be replaced or restored)
Comments:	Recently reinstalled after the old display case broke. Grandfathered in by the HDC. Quarterboard:

Location:	Side of Congdon & Coleman Insurance, corner of Centre St. and Main St.
Construction:	Solid wood, plexiglass (display case)
Dimensions:	N/A
Type:	Wall sign, noticeboard
Condition:	FAIR (should be replaced or restored moving forward)
Comments:	Grandfathered in by the HDC. Must continue to be maintained by the MMA for it to stay grandfathered in.

Location:	Inside the Aquarium, 28 Washington St.
Construction:	Aluminum, plexiglass (display case)
Dimensions:	N/A
Type:	Wall sign, noticeboard
Condition:	GOOD (does not need to be replaced)
Comments:	Inside the Aquarium, not visible unless a visitor buys a property pass and goes inside. Should advertise other MMA locations to visitors at the Aquarium.

Location:	Front door of Hinchman House (when in season), 7 Milk St.
Construction:	Solid wood
Dimensions:	16 ½" x 28" x 1"
Type:	Hanging sign (not HDC regulated, gets taken down when museum is closed)
Condition:	GOOD (does not need to be replaced)
Comments:	Homemade charm, but is not very eye-catching. Includes days and hours.

Location:	Front entrance of Hinchman House (when in season), 7 Milk St.
Construction:	Foamboard
Dimensions:	24" x 36" x ¼"
Type:	Interior sign (not HDC regulated)
Condition:	GOOD (does not need to be replaced)
Comments:	Professional appearance, uses most recent version of new logo. Name for "Carnivorous Critters" event blends in with the background of the sign, is not very eye-catching. Event sign: 12" x 9" x ¼"

Appendix F: Sign Cost Estimates from Paul McCarthy

NANTUCKET CARVING & FOLK ART
Artists/Owners Jean Petty & Paul McCarthy
167 Orange St. Nantucket, MA 02554
mailing: PO Box 2375, Nantucket, MA 02584
508-325-7463 · jean@nantucketcarvingandfolkart.com

5479

PLEASE INDICATE THE ABOVE NUMBER WHEN ORDERING

TO

Maria Mitchell
4 Vestal St
Administrative Office

QUOTATION DATE	SALESPERSON
INQUIRY DATE	INQUIRY NUMBER
28 Nov 17	

Refinish Existing Sign
Very Good Condition

ESTIMATED SHIPPING DATE	SHIPPED VIA	F.O.B.	TERMS		

QUANTITY	DESCRIPTION		PRICE	AMOUNT	
1" = 10"	SINGLE SIDED		PREP + SAND	60	00
	TO BE MOUNTED ON ~~EXISTING POST~~ WALL		PAINT & PRIME @ 50 – 3 FINISH	250	00
	SIGN IN GOOD CONDITION • DELIVER TO US				
	WILL USE + REFINISH		FULL PATTERN & TRANSFER	200	00
	← 36" →		HAND Letter	600	00
24"			COMET SHADED BLUE	120	00
			WHITE STARS	100	"
			WHITE TRIM	60	"
				1890	00

MARIA ★ ★ ★ ★
MITCHELL ★
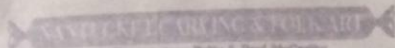Association
Administrative Offices
Mon–Fri 9am 5pm
4 Vestal St.

WE ARE PLEASED TO SUBMIT THE ABOVE QUOTATION FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECEIVE OUR PROMPT ATTENTION. THIS QUOTATION IS SUBJECT TO THE CONDITIONS PRINTED ON REVERSE SIDE, AND IS VALID FOR _____ DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY _____ ACCEPTED _____ DATE _____

Thank You!

ACCEPTANCE

NANTUCKET CARVING & FOLK ART
Artists/Owners: Jean Petty & Paul McCarthy
167 Orange St. Nantucket, MA 02554
mailing: PO Box 2975, Nantucket, MA 02984
508-325-7453   jean@nantucketcarvingandfolkart.com

5482

PLEASE INDICATE THE ABOVE NUMBER WHEN ORDERING

TO   Maria Mitchell Assn.

QUOTATION DATE	SALESPERSON
INQUIRY DATE 30 Nov 17	INQUIRY NUMBER

Refinish Original Sign

ESTIMATED SHIPPING DATE	SHIPPED VIA	F.O.B.	TERMS		

QUANTITY	DESCRIPTION	PRICE		AMOUNT	
SCALE 1"=12"	Single Sided Mounted on Posts	PREP + Sand		100	00
		PAINT x5 @ 100		500	00
		FULL PATTERN & TRANSFER		300	00
		Hand Letter		1600	00
		Comet + Stars		220	00
		TRIM		160	00
		Map + Buildings		200	00
				3100	00

MARIA MITCHELL ASSOCIATION
1 HINCHMAN HOUSE NATURAL SCIENCE MUSEUM
2 RESEARCH CENTER
3 MITCHELL HOUSE BIRTHPLACE of MARIA MITCHELL
4 LOINES OBSERVATORY
5 ADMINISTRATIVE OFFICE (OPEN YEAR ROUND)

37"

49"

WE ARE PLEASED TO SUBMIT THE ABOVE QUOTATION FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECEIVE OUR PROMPT ATTENTION. THIS QUOTATION IS SUBJECT TO THE CONDITIONS PRINTED ON REVERSE SIDE, AND IS VALID FOR _____ DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY _____ ACCEPTED _____ DATE _____

Thank You!

ACCEPTANCE

QUOTATION

5480

PLEASE INDICATE THE ABOVE NUMBER WHEN ORDERING

Artists/Owners Jean Petty & Paul McCarthy
167 Orange St. Nantucket, MA 02554
mailing: PO Box 2075, Nantucket, MA 02584
508-325-7463   jean@nantucketcarriagewolkart.com

TO: Maria Mitchell Assn

QUOTATION DATE	SALESPERSON
INQUIRY DATE WED 29 NOV 17	INQUIRY NUMBER

Reduce size to 18" x 46" solid wood 5/4"
VERY BAD CONDITION

ESTIMATED SHIPPING DATE	SHIPPED VIA	F.O.B.	TERMS

QUANTITY	DESCRIPTION	PRICE	AMOUNT
Scale 1" = 10"	NEW PANEL 5/4" x 18" x 46"		
	CONSTRUCT w/ BATTANS (3)	120	—
	ON BACK - EXTERIOR GLUE	240	—
	6 B.F. @ 40 240 PREP. SAND & TRIM	120	—
	PAINT 2 PRIME 3 FINISH @ 100	500	—
	Full pattern TRANSFER	250	—
	HAND Letter	600	00
	COMET Shade BLUE	120	00
	WHITE STARS	120	00
	WHITE TRIM	100	00
		2170	00

MARIA MITCHELL
LOINES OBSERVATORY

18"

46"

WE ARE PLEASED TO SUBMIT THE ABOVE QUOTATION FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECEIVE OUR PROMPT ATTENTION. THIS QUOTATION IS SUBJECT TO THE CONDITIONS PRINTED ON REVERSE SIDE, AND IS VALID FOR _____ DAYS, THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY _____   ACCEPTED _____   DATE _____

Thank You!

ACCEPTANCE

PLEASE INDICATE THE ABOVE NUMBER WHEN ORDERING

TO : MARIA MITCHELL ASSN.
   4 Vestal St
   MITCHELL HOUSE

QUOTATION DATE	SALESPERSON
INQUIRY DATE 28 Nov 17	INQUIRY NUMBER

ESTIMATED SHIPPING DATE	SHIPPED VIA	F.O.B.	TERMS

QUANTITY	DESCRIPTION	PRICE	AMOUNT
SCALE 1½"=1'	SINGLE SIDED HAND PAINTED NEW SIGN — NEW PANEL 5/4"x18"x30" CONSTRUCT w/ Battans(2) ON BACK - EXTERIOR GLUE F.F. PREP + SAND + TRIM		400 00
	Paint 2 Prime 3 Finish		250 00
	FULL PATTERN & TRANSFER		200 00
	HAND LETTER		800 00
		COMET- SHADED BLUE	220 00
		WHITE STARS	
		WHITE TRIM	60
		CLOSED Attached Q'brd ½"x2"x24"	150 00
		OPEN Attached NEED HRS INFO	150 00
	NAVY BLUE BACKGROUND WHITE LETTERS & TRIM & COMET & STARS		2230 00

30"
18"
MITCHELL
HOUSE
Birthplace of Maria Mitchell
America's first woman astronomer
1818 - 1889
(CLOSED for the SEASON)

WE ARE PLEASED TO SUBMIT THE ABOVE QUOTATION FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECEIVE OUR PROMPT ATTENTION. THIS QUOTATION IS SUBJECT TO THE CONDITIONS PRINTED ON REVERSE SIDE, AND IS VALID FOR _____ DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY _____   ACCEPTED _____   DATE _____

ACCEPTANCE   Thank You!

Appendix G: Sign Cost Estimate from Tom Watson
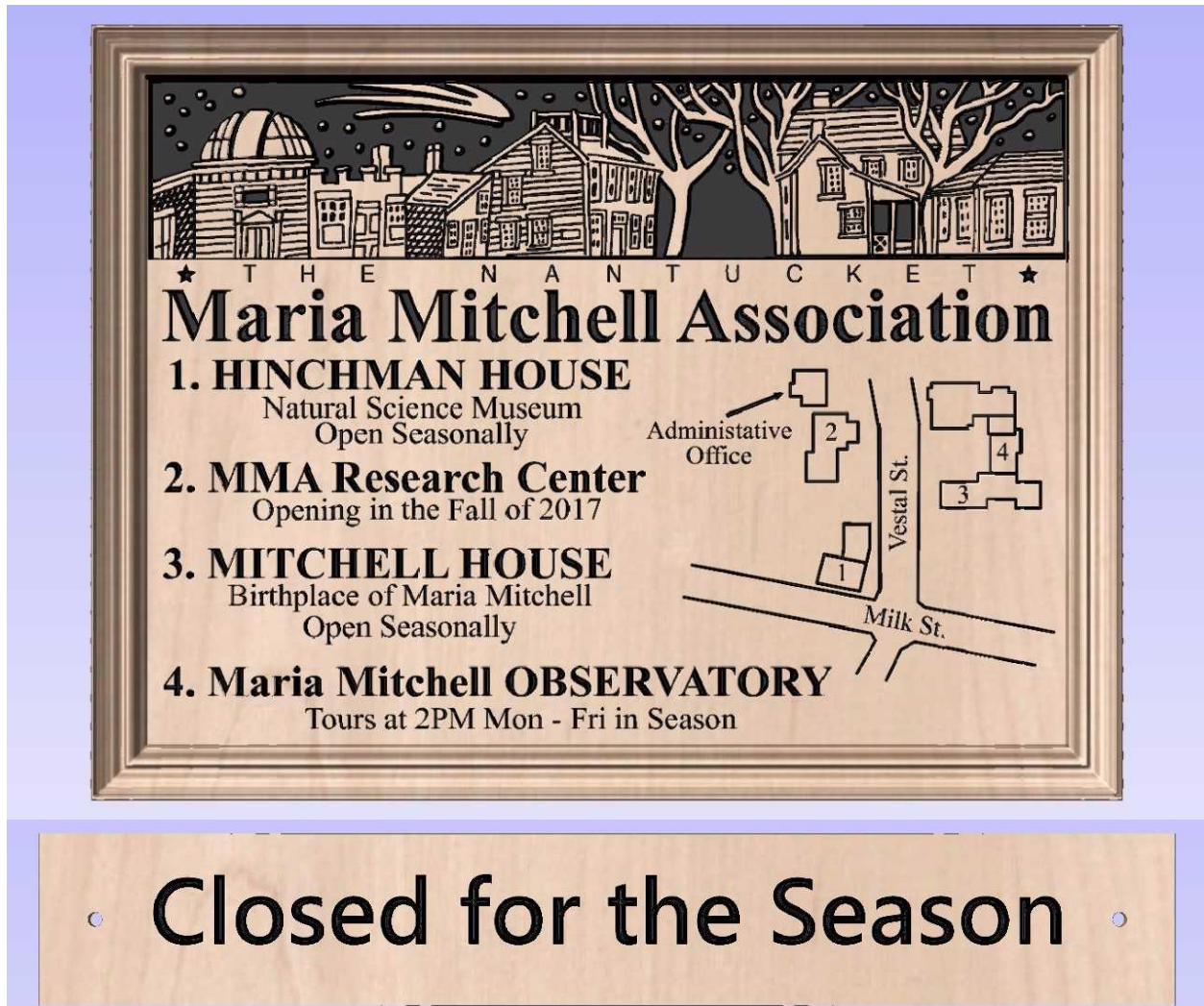
Tom Watson of Signs in Wood (located in Washington, USA) has created the above mockups for two of the MMA's signs. The top mockup is of the sign at the corner of Milk St. and Vestal St., and its dimensions are 48" x 36" x 1". The bottom mockup is of the plaques for the individual signs on MMA buildings dictating whether they are open or closed for the season, and its dimensions are 20" x 3" x 1". Both are carved into solid Spanish Cedar wood and coated in a waterproof layer. The total cost for these two signs would be about **$995 plus shipping**, but this is subject to change based on any edits to the sign.

Appendix H: Draft of Overarching Brochure

Programming:

With the understanding that people learn best through experience, the MMA aims to provide excellent, hands-on learning opportunities that engage children, young adults, families, and adults in science. The diverse ecosystems of Nantucket serve as the classroom and the means to awaken our students' interest in marine science, natural science, astronomy, field research, and environmental stewardship.

Become a Member:

As a member of the Maria Mitchell Association, you will be granted the following benefits:

- **Unlimited free admission to all MMA properties**
- **Free admission to Open Nights and the Science Speaker Series**
- **Discounted rates on programs and at the Museum Shops**
- **Invitations to Member-Only Events**
- **And more!**

For more information about the MMA and what it has to offer, visit mariamitchell.org.

About the Maria Mitchell Association (MMA):

The Maria Mitchell Association (MMA) was founded in 1902 to preserve the legacy of Nantucket native astronomer, naturalist, librarian, and, above all, educator, Maria Mitchell. Maria Mitchell believed in "learning by doing" and today that philosophy is reflected in MMA's mission statement, programs, research projects, and other activities.

The MMA operates two observatories, a natural science museum, an aquarium, and preserves the historic birthplace of Maria Mitchell. A wide variety of science and history-related programming is offered throughout the year for people of all ages.

4 Vestal Street
Nantucket, MA 02554
508.228.9198
mariamitchell.org

Maria Mitchell Association
Nantucket's Science Center

mariamitchell.org

The Maria Mitchell Association
Nantucket's Science Center

About Maria Mitchell:

Maria Mitchell (pronounced Ma-RYE-ah) was an astronomer, librarian, naturalist, and above all, educator. She discovered a comet through a telescope, for which she was awarded a gold medal by the King of Denmark. She was then thrust into the international spotlight and became America's first professional female astronomer.

1. Aquarium and Gift Shop • 28 Washington St.

The aquarium showcases numerous examples of the amazing sea life from the shores of Nantucket, including seahorses, octopuses and sharks! Meet the sea life up close and personal at the touch tank!

2. Natural Science Museum at Hinchman House • 7 Milk St.

Hinchman House is a cross between a classic natural history museum, zoo, and science center. Visit to learn how Nantucket came to be an island, identify currently flowering plants, discover the six species of snakes that inhabit Nantucket, and see our live animals!

3. Mitchell House • 1 Vestal St.

The Mitchell House contains many intriguing artifacts from the Mitchell's daily life in the 19th century, including many of Maria's personal items. The kitchen features a remarkably well preserved example of faux-wood grain painting from the 1850s, and is one of the best preserved Quaker households on Nantucket.

4. Vestal St. Observatory • 3 Vestal St.

The Vestal St. Observatory has been the site of research, lectures, and other programs since 1908.

5. Vestal St. Research Center • 2 Vestal St.

Once the schoolhouse of William Mitchell, the MMA Research Center houses the MMA's natural science collections and serves as a research space for scientists and students, as well as a lecture space.

6. Administrative Offices at Drake Cottage • 4 Vestal St.

Stop by for more information about what the MMA has to offer!

7. Loines Observatory • 59 Milk St.

When something special is happening in the night sky, Loines Observatory is the place to be. Come look at the stars through an antique 8" Clark telescope and a new state-of-the-art 24" research telescope during Open Nights.

8. Washington St. Facility • 33 Washington St.

The Washington St. Facility is a space for hosting special events, such as the Science Speaker Series.

Visit All of Our **Properties to Learn About Science on Nantucket**

Appendix I: Potential Plantings for MMA Locations

Picture	Name; Price; Blooming Period	Pros	Cons
	Sandplain Blue-Eyed Grass; $20/ounce of seeds; March-July	-Native to Nantucket -Low-maintenance -Perennial -Significance to natural science focus (populations are dwindling off island)	-Small flowers -Doesn't attract butterflies -Expensive without a nearby source
	Blue Morning Glory; $1.25/ounce of seeds; Late June-October	-Low-maintenance -Attract butterflies -Large flower, bright colors -Cheap	-Annual in Nantucket's climate -Not native to Nantucket
	Cranesbill Geranium; $3.33/plant; April-October	-Native to Nantucket -Low-maintenance -Perennial -Attract butterflies -Large flower, bright colors	-Sometimes more purple than blue -Expensive
	Blue Flag Iris; $20/ounce of seeds; April-October	-Native to Nantucket -Perennial -Attract butterflies -Large flower, bright colors	-Need plentiful water

Appendix J: Potential Benches for MMA Locations

Picture	Construction; Length; Price; Brand	Pros	Cons
	-Pine planks with steel frame -6 feet ~$250 -Leisure Craft Inc.	-Cheap	-Pine wood, not as durable as -Not as comfortable
	Mahogany planks with steel frame -6 feet ~$300 -Leisure Craft Inc.	-Cheap	-Not as comfortable
	-Mahogany planks with steel frame -6 feet ~$1,600 -Leisure Craft Inc.	-Durable -Comfortable (twice as many planks)	-Expensive
	-Pine planks with steel frame -6 feet ~$200 -Leisure Craft Inc.	-Cheap -Picnic table	-Not as comfortable -Takes up more space

Appendix K: Social Media Guidelines

1. General Social Media Usage:

These guidelines should be applied to all of the social media platforms the Maria Mitchell Association posts to. A consistency in types of posts, times of posts, and the quality of posts should be present in the MMA's social media pages. These pages include those on the platforms Instagram, Facebook, Twitter, TripAdvisor, and many others.

Each platform should have a consistent type of content on it. For example, interesting photos should be shared on Instagram, whereas articles and web addresses should be shared on Twitter and Facebook. See the sections for each specific social media platform for more information on the content that should be posted to each.

Every post should be contextualized so it can be easily understood without any supplemental information or prior knowledge. This means writing posts in such a way that most who view them, even those unfamiliar with the MMA and what it does, can understand what the posts are trying to convey. To accomplish this, avoid using acronyms, complex language, or "inside jokes" without an explanation.

The MMA should also create and maintain a list of social media goals. Some of these goals should include, but are not limited to:

- Increasing public visibility of the MMA's mission
- Boosting overall physical visitation to the MMA's locations
- Improving personal interactions with visitors, members, scientists, and other organizations on or outside of Nantucket.

To keep these social media goals within sight, the MMA should also develop a list of principles to achieve these goals. Some of these principles should include, but are not limited to:

- Making every post meaningful (not just a post for the sake of posting)
- Avoiding "burst posting," or posting multiple times within rapid succession
- Posting at lunchtime (about 12PM) and dinnertime (6PM) local time, the times at which many people have breaks from work
- Promoting events ahead of time, perhaps a week before and the day before they happen

With these goals and principles for achieving these goals in mind, the MMA can use all of its social media pages effectively.

2. Instagram:

Instagram is a great platform for sharing eye-catching and interesting pictures. Successful Instagram accounts often focus on being visually appealing and sending a positive message. Posting once a day is good, but only if the content meets the same standards. It should be no more than once a day except for rare exceptions. With a focus on interesting pictures, Instagram is not the best platform for posting event flyers. A better option would be to post an interesting picture related to the event, or for events that

occur more than once a picture of a previous event, and then in the caption direct the reader to the website for more information and the ability to register.

For the MMA's Instagram, the pictures should be fun, scientific, and highlight the connection to Nantucket whenever possible. Relevant hashtags should be used, but not so many as to make it appear cluttered and hard to read. Longer captions are useful for educating and engaging, as well as helping the post gain more exposure because of the way Instagram's search engine and advertising algorithms work. At the same time, captions should not be too long or people may not bother to read them.

Instagram stories should be made available to a wider group of staff, interns, and volunteers. The stories would have more freedom and could be more fun and casual than the actual posts. Instagram stories are also good for live interaction and engaging with existing customers, which helps build a community.

3. Facebook:

Facebook is an excellent platform to use for updating people on the events the Maria Mitchell Association is involved in or hosting. This includes articles related to science, the MMA, or Nantucket. Facebook is also a great platform to share large numbers of photos at once (from say a recently held event) by using an album to avoid burst-posting.

4. Twitter:

Twitter is a social media platform the MMA can use to share articles. The articles the MMA posts should relate to Maria Mitchell, women in science, astronomy, natural sciences, and/or Nantucket. Appropriate hashtags should be used so the MMA and its posts can appear in more searches. Twitter is also a platform the MMA can use to post pictures of event flyers to keep followers updated on current events being hosted by the MMA. If an event were to be cancelled, a cancellation message should be posted on Twitter, so users who originally saw the event posting will likely see the event cancellation.

5. TripAdvisor:

TripAdvisor may not seem like a traditional social media platform organizations concern themselves with, but the MMA's presence on TripAdvisor should not be ignored. The MMA is all about creating an experience for visitors, and TripAdvisor is a platform where visitors are able to rate their experiences for those who may be considering visiting any one of the MMA's locations. Good ratings are likely to erase any

doubt about visiting for someone who may be on the fence.

To improve the MMA's presence on social media, staff, interns, and volunteers should develop a way to encourage visitors to leave reviews. It is important to do so naturally, rather than pressuring guests into feeling as though they should leave a review. This pressure could actually be a detriment to their experience. Having a link to the MMA's TripAdvisor page on marketing materials and having the TripAdvisor logo present at the MMA's locations are passive methods of encouraging TripAdvisor reviews. Note: permission is required to use TripAdvisor logos/reviews on printed material or websites. There is a method to request this usage on the TripAdvisor website via the contact us option in the help center.

There are active methods for encouraging TripAdvisor reviews that are not pushy. After an event or program a guest or member attends, the MMA can send an email thanking them for their time and business. If there was ever a personal connection established during the event or program, this can be included in the follow-up email as a way of showing how much their business was appreciated, and the email is more personal. Then, towards the end of the email, the MMA can gently ask for a TripAdvisor review and explain why feedback on that platform is important. The MMA can establish these connections with more personal programs, such as group bird walks, weeklong classes, and many others.

Finally, the MMA should constructively respond to all TripAdvisor reviews, whether these reviews are positive or negative. It is important to keep a positive image and arguing with someone who wrote a bad review will often reflect negatively on the MMA. Based on the specific review, it may be better to address their concerns, admit mistakes, or make corrections. By responding to all reviews, the MMA will show potential visitors they truly value providing a positive experience. Personal interactions of any kind, especially on a platform where the visitor experience is being rated such as TripAdvisor, are essential to ensuring visitor satisfaction and encouraging these visitors to come back again or refer their friends and family.

Appendix L: Summative Team Assessment

Looking back on our team charter, we found we made major improvements. All of us were able to accomplish our individual goals of improving research and writing skills, becoming more comfortable presenting, and improving leadership skills. As individuals, we were able to solidify our roles within the group. All team members participated in group discussions and everyone's ideas were considered throughout the project.

When we could no longer send the survey to our intended recipients, we consulted our advisors for guidance on how to move forward. It seemed like a major change in our methodology, but we were able to modify it. This required us to take a moment to collect ourselves and our thoughts before we continued working. It seems that overcoming this obstacle together helped solidify us as a team.

One aspect of our team dynamic that proved particularly beneficial was everyone's willingness to accept criticism and go through multiple iterations of something, even if it was not a major piece, in order to ensure high quality. One example of the product of this process is Figure 3. For such a simple diagram, it may be surprising to know that it went through eight different versions in order to keep it neat, simple, and easy to understand. This process involved a lot of communication, with constructive criticism and asking for feedback, and ultimately led to a well-refined diagram. Team members also shared ideas and brainstormed aloud more often, creating a more refined understanding of all aspects of the project. This also helped during the writing and revision process, as team members suggested changes and were able to discuss the changes in a respectful fashion. Before comments were resolved, all team members concurred that the comment had been addressed. As we look forward to future team projects, we believe it would be beneficial to initiate this level of communication earlier on in the team building process by being more willing to get out of our comfort zones.

We understood as a group that we wanted to have work done in advance in order to make sure we met deadlines. Therefore, the group made sure all drafts were completed the day before the deadline, so any issues could be worked out before the submission. This helped a lot when the group had to convert documents from Google Docs to Microsoft Word, allowing plenty of time to properly format them before each draft was due. Additionally, this gave us the opportunity to format the final drafts of our report in such a way that was visually appealing. We believe that this team experience was beneficial to our academic and future professional careers. Working as a team for such a long period of time enabled us to experience the processes of team forming, norming, and performing. Our development of skills in researching, report writing, and presenting will carry over into our future academic and professional endeavors.