

Promoting Access for Those with Disabilities to the Outdoors on Nantucket: Assessment and Communication

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Abstract

The goal of the Nantucket Commission on Disability (NCOD) is to fully integrate those with disabilities into the Nantucket community. This includes helping everyone experience the outdoor areas on the island. To aid in this mission, our team worked with NCOD to determine and communicate the accessibility at a variety of outdoor locations. We developed a methodology for assessing conservation area trails, public beaches, and public playgrounds based on published standards. Our final products included this report, a database of data from all assessed locations, a reference guide with detailed findings and recommendations to improve the accessibility at all the visited properties, and multiple webpages, one with an interactive map, that communicate current accessible locations on the island.

Executive Summary

Introduction

The disabled population consists of people who have restrictions with movement, activities, and/or senses due to mental or physical conditions (Office of Disability Employment Policy). Since 1968 the United States has made efforts to include those with disabilities in the national community with the formation of laws and organizations, such as the Architectural Barriers Act (ABA) of 1968, the Access Board in 1973, and the Americans with Disabilities Act (ADA) of 1990 (United States Access Board, 2013).

Although the ADA and ABA acts are designed to improve accessibility, the ABA standards for developed outdoor areas were not published until 2013. As a result, there are still many recreational areas such as trails, beaches, playgrounds, and outdoor locations that are not accessible to those with disabilities and could potentially be improved to increase disability access, including on Nantucket.

Much can be learned from other communities as to how they have approached the problem of implementing accessible features into recreational areas. For example, the Falls Village case study of the Appalachian Trail Re-Design of 2007 addressed issues of uneven terrain and erosion in their renovation of the trail (Demrow, 42). Also, a great example for accessible playgrounds is the Can-Do Playground, in Delaware, which is fully ADA compliant and consists of equipment encouraging tactile and physical play (Richards, n.d.).

While other places have made progress with accessible outdoor recreational locations, it is important to note there has also been progress on Nantucket to increase the accessibility of the island. The mission of the Nantucket Commission on Disability (NCOD) is “for the disabled population to fully integrate and participate in the Nantucket community” (Town of Nantucket, Commission on Disability, n.d.). Since 1990 NCOD has been conducting research on access problems of island residents with disabilities and recommending policies and changes to ensure those with disabilities are represented and accommodated. Through such activities they have had town sidewalks repaired, and provided parking permits to those who are disabled.

The Nantucket Commission on Disability has also partnered with other town organizations to improve the accessibility of recreational outdoor areas, including conservation land, playgrounds, and beaches. For example, since the spring of 2016, NCOD has worked with the Nantucket Islands Land Bank Commission to improve some of their trails and beaches (McDonough, Sept. 26, 2016).

Although NCOD has made progress in outdoor recreational areas, the island still has potential for more outdoor accessibility projects to be completed. Nantucket’s outdoor recreational areas provide vistas with much to be seen and enjoyed. If the outdoor recreational areas were altered, those with disabilities could be given better access.

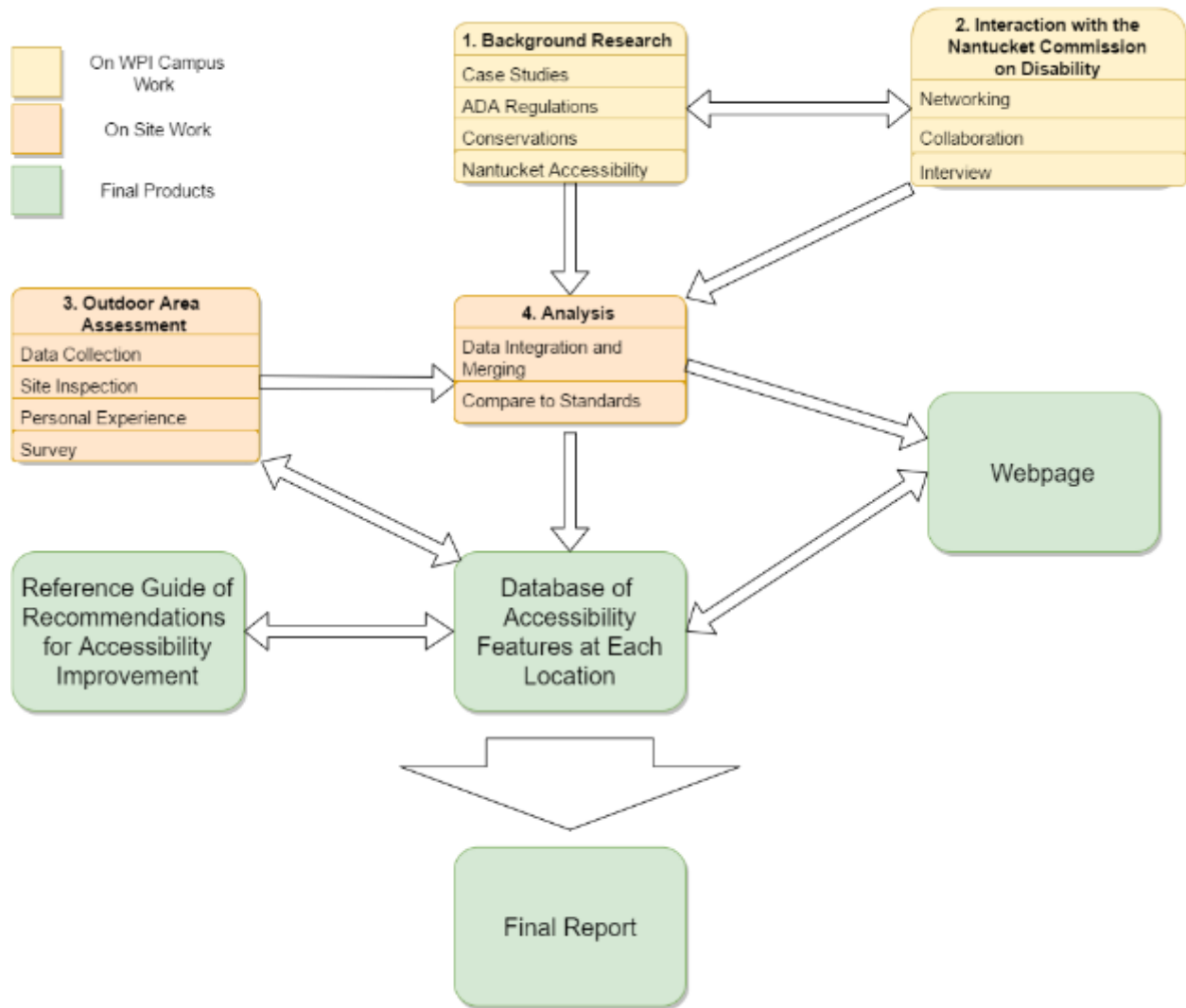
Objectives and Methodology

The mission of this project was to advance the outdoor leisurely opportunities for the those with disabilities and improve the quality of their recreational experience on Nantucket.

Addressing the goals and objectives of this project, outlined below, began during our preparation term on campus in Worcester and then completed on island.

1. Assess the current accessibility at a majority of the trails, beaches, and playgrounds on Nantucket by creating a methodology for assessing each type of location and a database where this information could be easily stored, analyzed, and accessed.
2. Provide recommendations for accessibility improvements at each assessed area, based on our site analyses, detailed designs, models, background research, and stakeholder input.
3. Communicate the current accessibility features, as well as possible improvements, at each assessed location to people with disabilities through the creation of a webpage where this information can be publicly accessed.

The flowchart below illustrates our work to achieve our objectives.



Project Overview

Interviews and Surveys

When we arrived on the island our first task was to identify key stakeholders so that we could interview and survey them about the most popular areas to visit, which outdoor locations needed the most improvements and if conservation owners were willing to aid in the renovations. These key stakeholders included, among others, conservation groups and members of both the disabled and non-disabled communities.

Outdoor Area Assessment

Next we visited trails in conservation areas, public beaches, and public playgrounds, and assessed current accessibility using guidelines set forth by the ABA and ADA, a checklist provided by the company GameTime, the Universal Trail Assessment Process (UTAP), and a

scholarly report on the accessibility of trails and parks in British Columbia. Our method for assessing the accessibility of each site followed a general series of steps;

1. Create a checklist of features and amenities to measure and observe at each location based on published standards and other background research
2. Identify appropriate sites to visit for each of the main outdoor area types: trails, beaches, playgrounds
3. Visit sites and make appropriate measurements, take pictures, etc.
4. Transfer data into a database
5. Summarize the data from the database into another template including the qualitative data, and short and long term recommendations
6. Compare results from each visited location to published standards and recommendations
7. Draw conclusions for accessibility by different type of disability, make recommendations, prioritize, etc.

Findings and Results

Interviews and Survey

Through the interviews of conservation groups, we found the majority of the conservation groups have open minds to making improvements to their properties to better accommodate those with disabilities. The Massachusetts Audubon Society is a great exemplar of a group whose properties accommodate those with disabilities. The Massachusetts Audubon Society has 12 accessible properties throughout the whole state, and hopes to improve the two they own on Nantucket.

Our qualitative community survey also helped us gauge viewpoints of accessibility on the island. We heard from 28 residents who both reinforced the perceptions we had of the island's accessibility as well as gave us additional insights. For example, the responses informed us that many of the beaches are inaccessible due to the absence of access mats/surfaces for steep and sandy terrain, or designated handicapped accessible parking spaces.

Below is a summary of our general findings at the different types of locations;

Conservation Areas

- All of the parking lots of the assessed locations were dirt, grass, sand, or gravel which limits the ability of those with disabilities to traverse the parking lots.
- Many locations did not have designated accessible parking which would provide the shortest possible access route to the entrance.
- The trails are uneven which increases the chance of tripping and falling.
- More than half of the locations did not have benches which limits those who cannot walk or stand for a long time because they do not have places to rest.
- The bathrooms were non-existent, and/or not handicapped accessible which limits the time someone can spend at the conservation area because if they have to use the facility they must leave.
- The entrances have obstructions that limit or prevent wheelchair and other mobility assistive device access.

Beaches

- The parking lot surfaces varied between all beaches with some more uneven and harder to traverse than others depending on the surface.
- Three of the eleven beaches assessed had paved parking lots and accessible parking spaces to increase the stability of the surface those with disabilities traverse over.
- Less than half of the beaches had accessible bathroom buildings to allow people to stay at the beaches longer.
- The entrances have good width to allow those with mobility assisting equipment to go through but their steep slopes increase the chance of losing balance.
- More than half of the beaches have signage that indicates their emergency location number so if anyone gets injured, people can easily notify responders where they are.
- None of the beaches had permanent access routes from the beach entrances.
- The nature of the sand and surf depended on the region the beach is located in.

Playgrounds

- The surface of playground parking lots varied depending on the distance of the playground from town.
- The amount of parking spaces and accessible parking spaces at each playground varied.
- Measured parameters for playground entrances met standards so those in wheelchairs can easily enter and exit the playground.
- Every playground surface is sand which is an unstable surface
- The play component measurements are compliant with standards so children can easily and safely utilize the playground.
- The physically engaging play components were too rigorous to accommodate multiple disabilities, therefore, it was inaccessible.
- There are multiple benches present at all of the playgrounds to allow those who cannot stand for extensive periods of time to rest.
- There was sensory play at 4 of the 5 playgrounds to engage children and their imaginations in other ways besides their motor skills.

“Other Locations”

- All of the parking lots were either dirt or grass, making them uneven and creating instability.
- None of the locations had accessible parking spaces to prevent those with mobility assisting equipment to be limited for space.
- The uneven pathways of 3 of the 9 properties cause instability for those traversing over them and increase the probability of someone tripping and/or falling.
- The cliffs and water adjacent to 6 out of the 9 properties without any barrier make those with disabilities more susceptible to falling over the drop-offs or into the water.

Recommendations

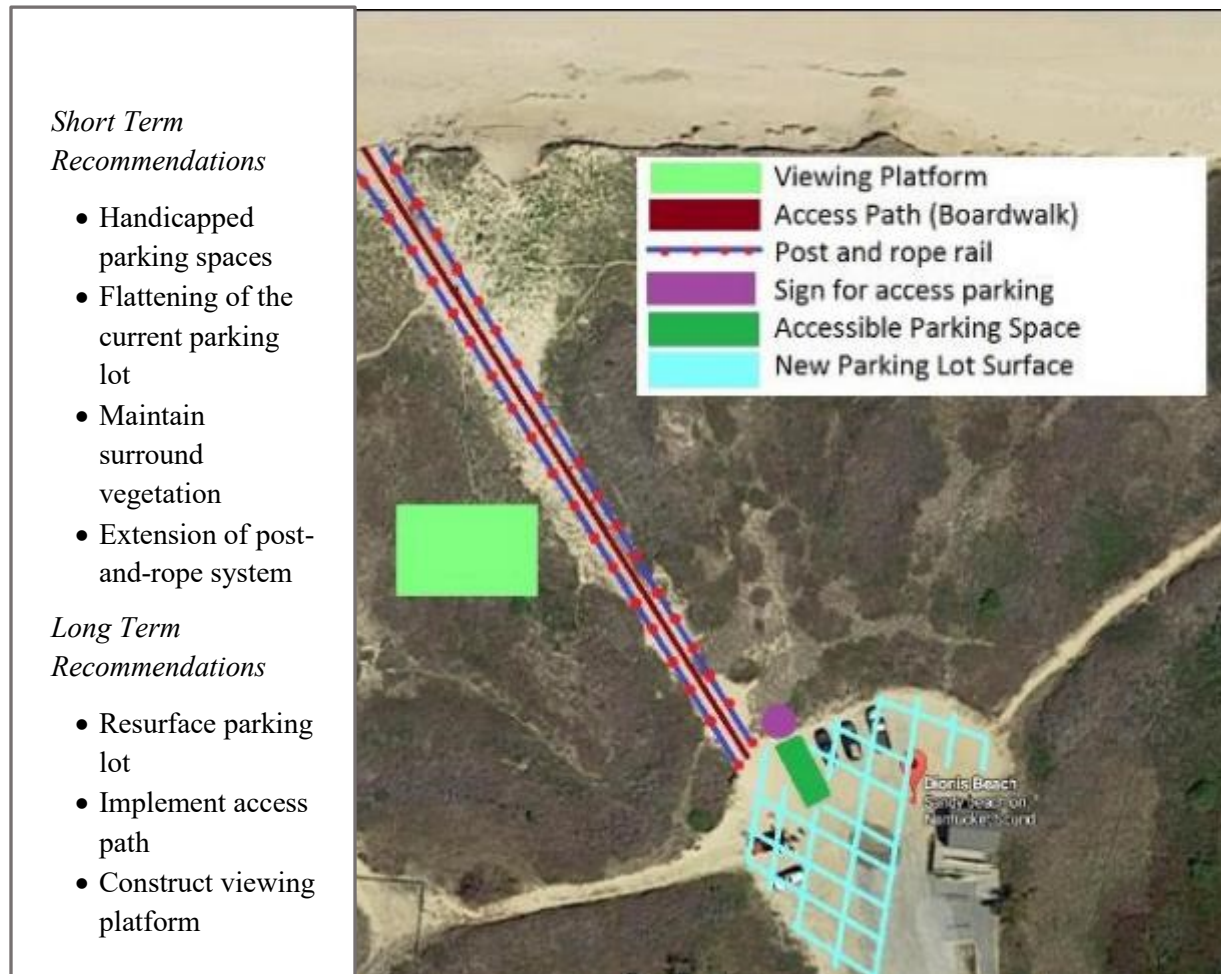
Using the results from the assessment process, our background research and case studies we proposed and documented both short term and long term accessibility recommendations for each location based on feasibility. The analysis of feasibility included: popularity of the location, items needing improvements, extensiveness of needed accessibility improvements, and willingness of the property owner to improve accessibility. The following are general recommendations for each type of locations;

Type of Location	Short Term	Long Term
Conservation Areas	<ul style="list-style-type: none"> • Designate handicapped parking • Level the parking lots • Add benches 	<ul style="list-style-type: none"> • Resurface parking lots • Level and resurface trail • Add stable foundation beneath benches • Install post-and-rope guide system
Beaches	<ul style="list-style-type: none"> • Designate handicapped parking • Level the parking lot • Implement signage 	<ul style="list-style-type: none"> • Resurface parking lots • Designate handicapped parking • Build accessible bathrooms • Construct viewing platform • Install improved access route • Implement post-and-rope guided system
Playgrounds	<ul style="list-style-type: none"> • Add signage • Install benches • Implement wheelchair-accessible picnic tables 	<ul style="list-style-type: none"> • Resurface the unpaved parking lots • Designate handicapped parking • Install access routes • Resurface entire play area
“Other Locations”	<ul style="list-style-type: none"> • Install benches • Designate handicapped parking • Implement informational signs with Braille 	<ul style="list-style-type: none"> • Resurface parking areas • Resurface pathways or trails

General Recommendations for Location Types

In-depth designs were developed for select locations as examples of what is possible to enhance accessibility for those with disabilities. These properties were selected considering the ease of being granted permission by the owners, and the intensity of the labor required to implement the recommendations. These designs were visualized using the photography of the specific locations and, once developed, illustrated through diagrams.

Below are the short and long term recommendations developed for Dionis Beach, one of the five locations we did in-depth analyses for. Included in the diagram for Dionis Beach (below) are illustrations of our recommendations.



Dionis Beach Recommendations

Final Products


Assessed Locations Database

The completed spreadsheets for each assessed location were combined into a single database where all of the quantitative and qualitative assessment data can be found for each assessed outdoor location. In this database, each spreadsheet was developed from one of the three basic types of “templates” we developed with parameters to assess and measure corresponding to the type of location evaluated.

Reference Guide of Assessed Locations

We also combined the templates for site presentation we developed into a single reference guide as a summary of our findings and recommendations. The figure below demonstrates an example of one of the completed templates we developed to summarize our findings and recommendations for a specific location. NCOD can distribute this guide to the

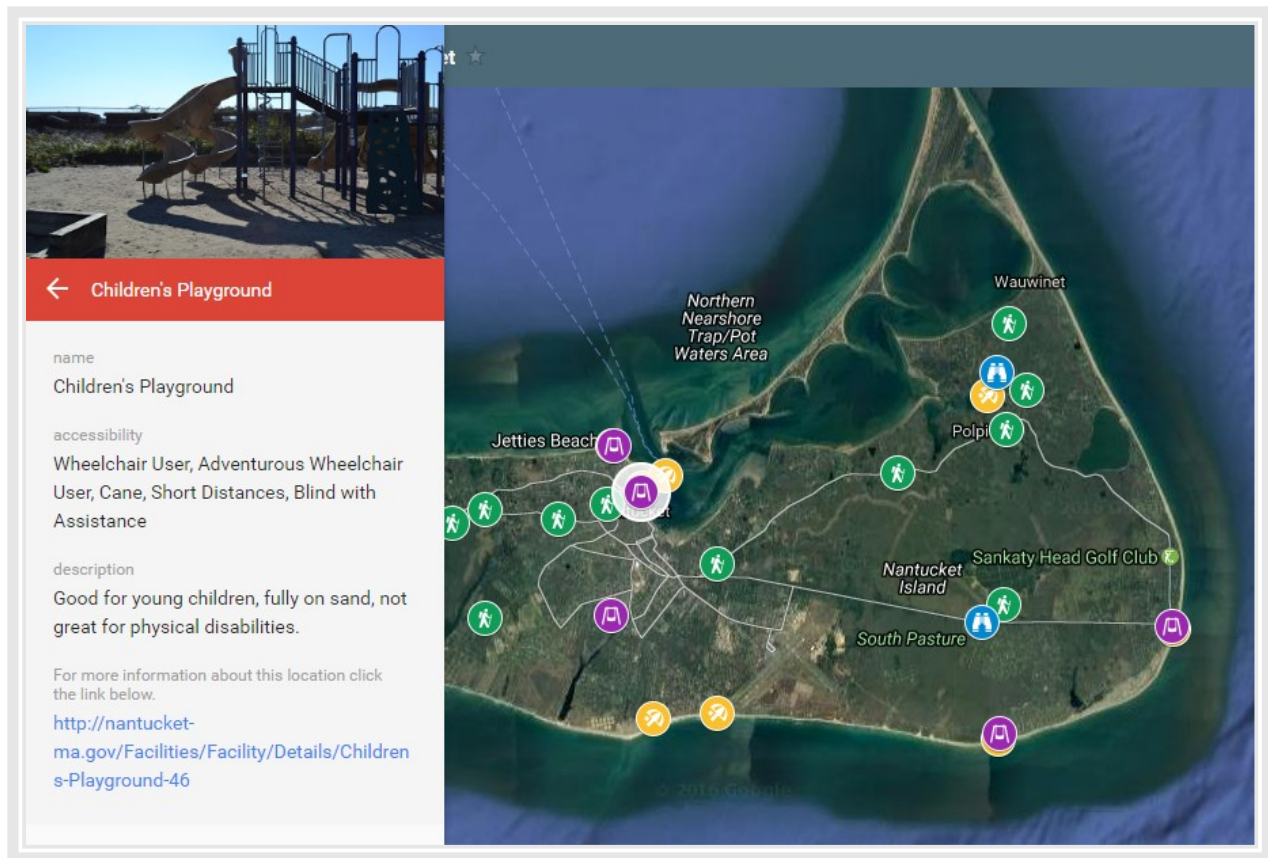
appropriate parties so that they may review it and decide if they would like to improve the location. As the location is improved notations can be made of the additional features and who the location is now accessible to.

Site Name	Crabbing Spot 1	
Owner	Federal, Linda Loring	
Type of Location	View and Bench	
Region	West	
Sub-Region	Madaket	
Current Accessible Elements	<input type="checkbox"/> Handicapped Parking <input type="checkbox"/> Handicapped Bathrooms <input type="checkbox"/> Ramps <input checked="" type="checkbox"/> Boardwalks <input checked="" type="checkbox"/> Benches <input checked="" type="checkbox"/> Signage <input type="checkbox"/> Sensory Elements	
Current Inaccessible Elements	<input type="checkbox"/> Rolling terrain <input type="checkbox"/> Cross-sloping terrain <input type="checkbox"/> Loose sand <input checked="" type="checkbox"/> Wetlands <input checked="" type="checkbox"/> Roots, rocks, sticks, sand <input type="checkbox"/> Poison Ivy, Ticks <input type="checkbox"/> Hunting area in fall	
Parts of Location Are Accessible to	<ul style="list-style-type: none"> • Wheelchair User • Adventurous Wheelchair • Cane • Short Distances • Blind with Assistance 	
Short Term Recommendations	<ul style="list-style-type: none"> • Pave the parking lot • Add spot for wheelchair next to the bench • Level the path 	
Long Term Recommendations	<ul style="list-style-type: none"> • Add benches up and down the bike path • Redo the dock to be ADA compliant 	

Example of one of the templates in Reference Guide (Crabbing Spot 1)

Webpages

The next product we developed for the Nantucket Commission on Disability was webpages providing information on accessible locations within the downtown area, resources for those with disabilities, and information detailing all of the currently accessible locations we assessed through an interactive map. A brief description of each location and its current accessible features were included on a separate page. The Commission can update the site descriptions as new accessible features are installed, as well as any other content that may need to be updated. The webpage can be found on the Nantucket government website through the services tab or by searching key words such as “accessibility” or “disability”.



Interactive Map from New Webpage

Lastly, we produced a final report detailing all of our background research, case studies, methodology, results, and conclusions made from our project.

Conclusion

By developing better means of communicating the accessibility of outdoor locations on Nantucket, we believe residents and visitors with disabilities will be more apt to know which areas would be easiest to visit and to make plans accordingly. The Nantucket Commission on Disability hopes to continually update the website to provide the public with accurate information on outdoors accessibility. Additionally, with the recommendations formed, the locations assessed can be improved by advancing the access for those with disabilities when they do visit. Through the proposed recommendations, NCOD looks forward to having more organizations contribute to the NCOD mission in ensuring those who are disabled feel a part of the whole community when visiting the outdoor recreational areas on Nantucket.

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1. Introduction

The disabled population consists of people who have restrictions with movement, activities, and/or senses due to mental or physical conditions (Office of Disability Employment Policy). Since the mid 1960's, the United States has created legislation to include the disabled population in all aspects of life and to prevent discrimination against the disabled. These efforts have come in the form of laws, such as the Architectural Barriers Act (ABA) of 1968, the formation of the Access Board in 1973 and the Americans with Disabilities Act (ADA) of 1990 (United States Access Board, 2013). For comparison, the ADA prohibits discrimination based on disability and mandates accessibility to “programs and services, transportation, the built environment, employment, and communication” at the private, local, and state levels (United States Access Board, n.d.), whereas the ABA requires that federally funded facilities be accessible according to established standards set forth by the Access Board. Amongst other responsibilities, the Access Board is responsible for overseeing the drafting and implementation of accessibility standards for facilities covered by the ADA and ABA (United States Access Board, n.d.).

Although the ADA and ABA acts are designed to improve accessibility, the ABA standards for developed outdoor areas were not published until 2013. As a result, there are still outdoor recreational areas such as trails, beaches, playgrounds, and many additional outdoor locations that are not accessible to those with disabilities and could potentially be improved to increase disability access, including many on Nantucket.

A lot can be learned from other communities as to how they have approached the problem of implementing accessible features into recreational areas. For example, relative to the improvement of trails, the Falls Village, Connecticut case study of the Appalachian Trail Re-Design of 2007 addressed issues of uneven terrain and erosion in their renovation of the trail. They used crushed gravel and widened the trails to improve accessibility (Demrow, 42, n.d.). For playgrounds, a notable example for accessible playgrounds is the Can-Do Playground in Delaware, which is now fully ADA compliant and consists of equipment encouraging tactile and physical play (Richards, n.d.).

The concepts and solutions provided by the examples noted above served as resources that could be applied to Nantucket given its unique environment. One of the most prominent and unique characteristics of Nantucket is how natural and undeveloped it still is. Part of the reason for this is that the island has what are known as conservation areas; areas that are maintained and protected by non-profit organizations (a.k.a. conservation groups) dedicated to preventing the development of the land, as well as preserving flora and fauna. The protected areas of Nantucket are very important elements of the island, so much so that the island is 50% conservation land (BioMap2, 2012) which equates to over 13,000 acres. The protected land is owned by five main

conservation groups and consists of beaches, grassy meadows, hardwood forests, salt marshes, and bogs (Nantucket Conservation Foundation, Properties, n.d.).

In recent years, Nantucket has made significant changes to increase the accessibility of the island. For example, the island has four taxis that are wheelchair accessible. Also, the Nantucket Commission on Disability (NCOD) provides parking permits to the disabled residents and visitors of the island (McDonough, Sept. 26, 2016), and has commissioned the repair of town sidewalks to make traversing the walkways easier for people with ambulatory concerns (Town of Nantucket, Accessible Transportation on Nantucket, n.d.). In the 1990s, no curb cuts or crosswalks existed; the town streets were simply cobblestone. However, since then NCOD has initiated the installation of various curb cuts and cross walks throughout the town to increase accessibility.

The Nantucket Commission on Disability has also begun working with the town government and other town organizations to improve the accessibility of recreational outdoor areas, including conservation land, playgrounds, and beaches. For example, since the spring of 2016, NCOD has worked with the Nantucket Islands Land Bank Commission to improve some of their trails (McDonough, Sept. 26, 2016). Also, accessible features have been added to some of the beaches, such as access mats and handicap accessible bathrooms, and information is readily available on how to contact the Department of Public Works (DPW) to reserve a beach wheelchair (Jermain, Nantucket Island Chamber of Commerce, n.d.). Lastly, in the fall of 2015, the public playground in Siasconset, Nantucket, known as Sconset Playground, was made fully accessible and compliant with ADA standards (Community Foundation for Nantucket, n.d.). The Sconset Playground is an example of the commitment to accessibility and an example of what the island residents have achieved in helping those with disabilities experience every aspect of life that someone without disabilities can enjoy.

Although the Nantucket Commission on Disability has made progress in outdoor recreational areas, the island still has potential for more accessibility projects to be completed. For example, there are several popular trails that could be widened for people with ambulatory concerns, and ropes or handrails could be added for those with sensory impairments. The beaches could be improved by implementing similar features to the ones mentioned for trails, temporary or permanent ramps for people with ambulatory concerns, and signage for people with sensory and cognitive disabilities. In addition, there are five more public playgrounds on the island which could be renovated to be more ADA compliant by adding, for example, play components that exercise the senses (also known as “sensory play”), and more stable surfaces for access routes to, from, and around play structures.

While there are opportunities on Nantucket for increased accessibility to recreational spaces, there are also many challenges to making recommendations on how to improve the spaces’ access. These challenges include: being granted access to the land to survey for potential improvements since several of the areas are privately owned; determining how the property owners could improve the land based upon its existing terrain; and drafting recommendations on

how to improve access without altering each location in a way that goes against the idea of conservation.

Project Goals

There were three goals for this project. The first was to assess the current accessibility of the majority of the trails, beaches, and playgrounds on Nantucket according to the methodology created for assessing each type of location. The second goal was to use our site analyses, detailed design options, models, background research, and stakeholder input to develop short term and long term recommendations for improving the accessibility of specific locations. The final goal was to increase awareness of the accessibility of outdoor recreational areas by making the general information and qualitative data gathered on the assessed locations more readily available for those with ambulatory, cognitive, and sensory disabilities.

For final products, a database containing site survey spreadsheets with access measurement metrics and observations for each assessed location was created. A detailed accessibility reference guide containing findings, recommendations, and images was developed for each location visited based on data from our spreadsheets for all of the visited trails, beaches, and playgrounds. Multiple webpages were also created which include in-depth descriptions of select locations' degree of accessibility in addition to brief descriptions of all of the currently accessible locations. On one webpage, the select locations that are currently accessible are pinpointed on an interactive map of the island, with descriptions of each property appearing after clicking on the pins. Another webpage has information on helpful resources for those with disabilities traveling about the island. This final report was written to fully document our project activities.

2. Background

In this chapter, we present an overview of selected topics pertinent to understanding accessibility. We pay particular attention to understanding the unique challenges posed by the island of Nantucket when improving access to outdoor locations. In addition to a review of accessibility laws, standards and definitions, a history of the island, and our sponsor, the Nantucket Commission on Disability are included. Also discussed are the types of outdoor areas we will be assessing with references to case studies.

2.1 Disability Overview

The term “disability” refers to a wide range of impairments including physical, cognitive, and sensory. The ADA defines a disabled individual as somebody “who has a physical or mental impairment that substantially limits one or more major life activities, a person who has a history or record of such an impairment, or a person who is perceived by others as having such an impairment” (United States Department of Justice, n.d.). In 2010, 56.7 million people in the United States reported having a disability (United States Census Bureau, n.d.).

In an effort to enhance recreational and tourist experiences for people with disabilities, and fully apply the concept of accessibility to those types of activities, the Sustainable Tourism Cooperative Research Centre (STCRC) funded a workshop in 2005 as a means to develop an agenda for accessible tourism. They established a working definition for accessible tourism as “a process of enabling people with disabilities and seniors to function independently and with equity and dignity through the delivery of universal tourism products, services and environments (adapted from OCA 1999). The definition is inclusive to the mobility, vision, hearing and cognitive dimensions of access (Darcy, 2006, p.4)” (Darcy et.al, 2009).

A concept that can help with accomplishing accessible tourism is universal design. The Center for Universal Design defines universal design as “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design’ (Mace)”. Universal design is the idea of making communications, products, and the developed environment easier to utilize by people of all ages, sizes, and abilities, in the most economical way (The Center for Universal Design, 2008). Universal design is based on equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use (The Centre for Excellence in Universal Design, n.d.). These principles will be considered throughout the duration of this project when considering accessible features.

2.1.1 Current State of Accessibility in the United States

The Americans with Disabilities Act (ADA) was passed in 1990 and prohibited discrimination against those with disabilities and promoted equal opportunity regarding “employment, state and local government service, public accommodations, commercial facilities, and transportation”. The ADA is enforced by the Department of Justice and the Department of Transportation (United States Department of Justice, n.d.).

Many legal regulations for accessibility of public buildings and spaces are specified by this act. However, accessibility for most outdoor spaces, such as the locations we assessed on Nantucket, are covered by the Architectural Barriers Act (ABA) of 1968. More recently, in 2013 the Access Board developed accessibility requirements for outdoor developed areas which are now under the ABA Accessibility Standards and apply to “national parks and other outdoor areas developed by the federal government” (United States Access Board, n.d.). These recent additions include regulations for trails, viewing areas, beach access routes, and outdoor recreation access routes; all of which are applicable to Nantucket.

2.1.2 Accessibility on Nantucket

From quick observations, Nantucket may not seem very accessible. As shown in Figure 1 cobblestone streets, brick sidewalks, and antique buildings are everywhere. However, significant progress has been made to make the island more welcoming to, in particular, those who use wheelchairs. For example, there are buses, as well as wheelchair-accessible taxis that charge the same price (Town of Nantucket, n.d., Accessible Transportation on Nantucket, n.d.). The town has also made all of the downtown public bathrooms wheelchair accessible, but only a few shops have additional accessible features, such as ramps. Unfortunately, most of the beaches are “not highly accessible in a wheelchair” (Witkowski, n.d.), although some communities, such as Surfside offer beach wheelchairs to visitors. In addition, if you make a reservation with the DPW, they can provide you with a beach access wheelchair free of cost (Nantucket Commission on Disability, n.d.).

Going back into town, some of the popular restaurants have made changes to make themselves open to those with ambulatory concerns. These changes include having wheelchair accessible ramps and bathrooms. Several of the major museums including the Whaling Museum and the Library have also made efforts to increase improve the accessibility of their facilities by making them fully ADA complaint. Although the cobblestone roads and brick walkways are a characteristic of Nantucket town, changes to improve wheelchair access have been made, as seen in Figure 1, by making curb cuts in the sidewalks and laying bricks across the street. Lastly, there is a volunteer-driven organization called Nantucket Wheelers dedicated to taking wheelchair-bound citizens on bike rides around the island with specially-designed bikes (Nantucket Wheelers, 2016).



Figure 1: Downtown Nantucket (Nantucket Real Estate, 2016)

When traveling to Nantucket, it is advised by the Nantucket Commission on Disability (NCOD) not to fly due to the difficulty of entering and exiting the small commuter airplanes even though the local airport is fully accessible. However, if it's in the plans to fly, it is recommended to notify the flight agency of a disability ahead of time. The alternative form of transportation is the ferry which is a pleasant hour or two-hour ride depending on whether the fast or slow ferry is taken. The ferries are fully wheelchair-accessible but "the curbing to go on deck has a steep step" (Witkowski, n.d.). Taking the ferry is the method of travel that the Nantucket Commission on Disability recommends to anyone who is wheelchair bound.

2.2 Nantucket

Nantucket is a small landmass that was left behind by retreating glaciers 10 to 12 thousand years ago. The island is a mere 14 miles long and on average 4 miles wide and is located just 30 miles south of Cape Cod (Town of Nantucket, Basic Facts, n.d.). Figure 2 shows a current map of the island.



Figure 2: Map of Nantucket (Wikimedia, 2011)

Nantucket was founded in 1659 and over time became the center of the world's whaling industry. Today, the island has become a popular tourist destination due to several unique characteristics. The beaches are pristine, over half of the island is conservation land that is open to the public, and almost the entire island is a historical site. Some of the most popular places to visit are the Nantucket Whaling Museum, the Nantucket Shipwreck and Life-Saving Museum, and the Maria Mitchell Association. The Whaling Museum has many exhibits detailing the history of Nantucket's whaling industry. The Shipwreck and Life-Saving Museum showcases some of the major boating accidents that have occurred on and around Nantucket. The Maria Mitchell Association contains the telescope, observatory, and home used by the first female professional astronomer from the United States, Maria Mitchell (Rogers, n.d.).

Nantucket is almost completely dependent on the mainland for supplies. Food has to be shipped over daily to feed the island's 12,000 permanent residents. Electricity is wired across the ocean floor in a pair of 35 megawatt cables. Luckily, fresh water can be found on the island through wells. When the island was formed a layer of clay formed an aquifer under the island protecting it from seawater. This allows the island to not need to have a filtration or purification system for its water supply.

The island is unique with its mission to maintaining the historical atmosphere and keeping the exterior of new constructions historically accurate. The new constructions look very similar; cedar shingles cover the exterior and shutters boarder every window. Such construction

requirements make the island seem like a different world and if there weren't cars, one could easily believe that they had been transported back in time (Town of Nantucket, Basic Facts, n.d.).

The commission responsible for preserving what Nantucket looked like in the 1800s is the Historic District Commission (HDC) of Nantucket (Town of Nantucket, Basic Facts, n.d.). To build or modify a house or property on the island, the plans must be approved by the HDC to determine if they comply with Historic District guidelines on maintaining the character of the island. The combined efforts of the HDC and island's residents have managed resulted in the preservation and sue of to preserve and use over 800 buildings that date back before the Civil War, the oldest of which is the Jethro Coffin House dating back to 1686.

2.2.1 Nantucket Commission on Disability

The Nantucket Commission on Disability (NCOD) is a panel of five to nine members appointed by the Board of Selectmen. The goal of the Commission is “for the disabled population to fully integrate and participate in the Nantucket community” (Town of Nantucket, Commission on Disability, n.d.). To achieve this goal, NCOD researches local problems encountered by people with disabilities, documents their findings and seeks solutions to improve accessibility. Upcoming and current policies are also reviewed and modified by NCOD to make sure those with disabilities are represented. In addition, NCOD helps encourage and promote public awareness and participation in helping the disabled population be part of the community, as well as provide guidance and recommendations to local business on how to best allow the disabled population access to their facilities. In summary, the Nantucket Commission on Disability acts as the spokesperson for the disabled population in cases when they cannot speak for themselves and act as the bridge between them and the rest of the community.

2.2.2 Improving Accessibility at Nantucket Conservation Areas

As shown in Figure 3, Nantucket is just over 30,000 acres in size, of which over 50% is private conservation land (BioMap2, 2012). Six main conservation organizations control the majority of the preserved land. These organizations are dedicated to preserving the island and protecting the endangered wildlife that lives on Nantucket.

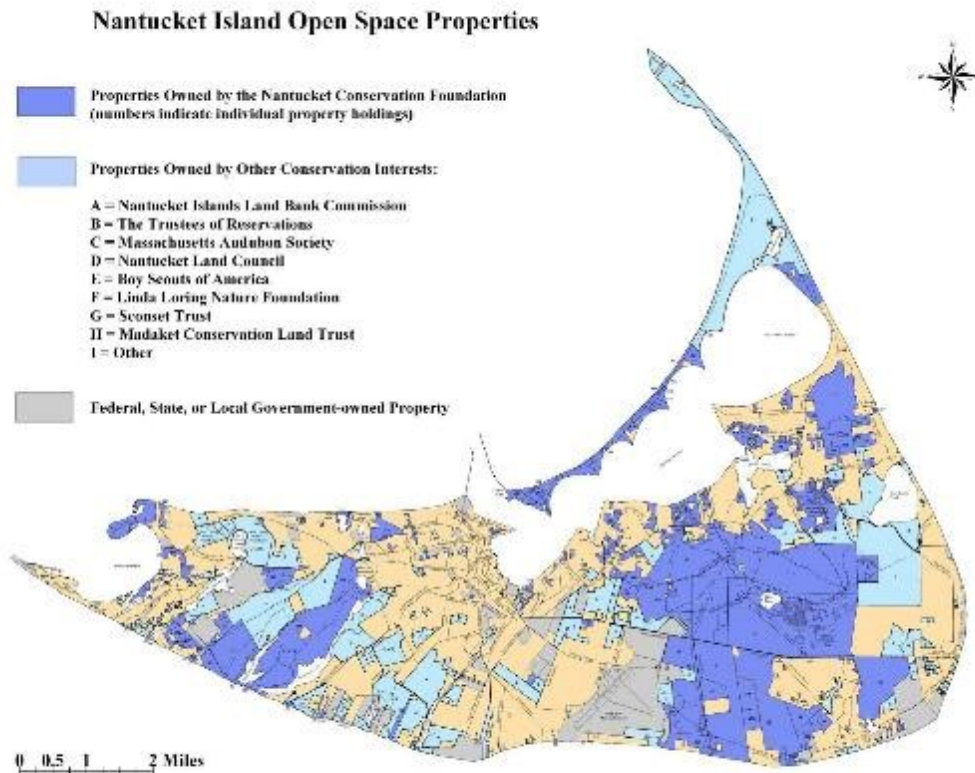


Figure 3: Nantucket Island Open Space Properties (BioMap2, 2012)

These organizations are also responsible for protecting over 400 endangered species, half of which are plants that thrive on Nantucket (BioMap2, 2012). In fact, one of the biggest threats to the flora and fauna is human beings, because some of the flora “can’t survive being stepped on more than once or twice.” (Brace, 11) and the fauna only breed in specific conservation areas. As a result, when visiting conservation land, the conservation group note that it is important to stay on the trails because of the delicate ecosystems and the presence of deer ticks which are common on the island and can carry Lyme disease (Centers for Disease Control and Prevention, 2016). Since over half of the island is protected, it should be able to be visited and experienced by all, especially those with disabilities. Appendix A.1 includes information on conservation area case studies. Below, a brief overview of the five main conservation groups and the Nantucket Land Council is described.

Nantucket Conservation Foundation

The Nantucket Conservation Foundation was started in 1963 as a nonprofit organization and owns just over 9,000 acres of Nantucket. Figure 4 shows the land that the National Conservation Foundation owns in pink. The primary goal of the Foundation is land acquisition for conservation and the prevention of extinction of endangered and rare species on Nantucket.

As of 2012, residing on Nantucket are 413 MESA (Massachusetts Endangered Species Act) species (Biomap2). Over half of these endangered species are plants and most live in the areas owned by the Conservation Foundation. In addition to protecting the land from development, the Foundation supports multiple research projects on its land that study the rare flora and fauna that are contained on the island. Currently, there are fourteen research and surveying projects sponsored by the Nantucket Conservation Foundation. These range from counting and tracking the cottontail rabbit population, a recovering endangered species, to studying the effects of prescribed cleaning of grasslands with fire (Nantucket Conservation Foundation, Current Research Projects, n.d.).



Figure 4: Nantucket Conservations (BioMap2, 2012)

Massachusetts Audubon Society

The Massachusetts Audubon Society is not unique to Nantucket. In total, the Mass Audubon Society owns 36,500 acres of land across Massachusetts (Mass Audubon, About Us, n.d.). This makes Mass Audubon the largest nonprofit nature conservation in Massachusetts and the host of over half a million visitors to its numerous locations.

In recent years and as part of their Strategic Plan 2020, the Society has been working to make many of its locations more accessible to people with disabilities (Mass Audubon, 2015). Currently, there are ten accessible trails on various properties owned by Mass Audubon in Massachusetts. These trails include features such as audio tours, post-and-rope self-guidance, Braille signs, and tactile maps (Mass Audubon, Accessibility at Broad Meadow Brook, n.d.). On Nantucket, Mass Audubon own just under 900 acres called the Sesachacha Heathlands surrounding Sesachacha pond. Winding through these acres are just over 3 miles of trails open to

the public. This portion of Nantucket is a habitat for over 300 species of birds (Mass Audubon, About Us, n.d.). More information on some of the other properties owned by the Mass Audubon Society can be found in Appendix A.1.5.

Nantucket Islands Land Bank Commission

The Nantucket Islands Land Bank Commission was the first land bank dedicated solely to conservation. It was founded in 1984 and currently owns around 3,000 acres on Nantucket. The Land Bank has acquired most of its land using a 2% tax levied on all property transfers. Their primary goal is to “acquire, hold, and manage important open spaces, resources, and endangered landscapes” (Nantucket Islands Land Bank Commission, Nantucket, Massachusetts – Home, n.d.). Since it was the first land bank dedicated to conservation, it has served as the model for many other conservation-based land banks in the USA. Within their land, they provide twelve locations for parking and trail access to the public (Nantucket Islands Land Bank Commission, Nantucket, Massachusetts – Home, n.d.).

Trustees of Reservations

The Trustees of Reservations, like the Massachusetts Audubon Society, are not solely located on Nantucket. In total, they own nearly 25,000 acres in Massachusetts dedicated to conservation and preservation of nature. On Nantucket, they control the majority of Great Point in an area called Coskata, as shown in Figure 5. To access Great Point, you can walk in for free, but it is much easier to go by vehicle suited for over-sand travel. However, to bring a vehicle you must buy a permit which is one of the Trustees main sources of income along with membership dues, annual contributions, special events, and competitive grants (Trustees, n.d.).

The Trustees goal is to work to preserve properties of exceptional scenic, historic, and ecological value in Massachusetts. They “strive to implement smart and effective public policies that help protect the special places of Massachusetts” (Trustees, n.d.).



COSKATA-COATUE WILDLIFE REFUGE (1,117 ACRES)

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islands@ttor.org • www.thetrustees.org

A PROPERTY OF THE TRUSTEES OF RESERVATIONS



Figure 5: Coskata-Coatue Wildlife Refuge (Trustees of Reservations, 2007)

Linda Loring Nature Foundation

The Linda Loring Nature Foundation was founded in 1999 by Linda Loring to be a privately operating conservation organization. The one property the organization owns resides along the head of Long Pond. The trails are open to the public in “a hope to promote environmental literacy” (The Linda Loring Foundation, 2007). In addition, the foundation has a weekly birding trip on Wednesdays from mid-May to mid-October. Similar to the Nantucket Conservation Foundation, the organization supports research on their property which is led by the Director of Research and Education, Dr. Sarah Bois. Lastly, the foundation works to develop interest in nature in kids by providing nature education classes for them during the summer at a small fee (The Linda Loring Foundation, 2007).

Nantucket Land Council

The Nantucket Land Council is different compared to the previously described conservation groups. The Nantucket Land Council does not buy land, but instead enable other conservation groups to buy land around the island. If the Council does acquire land on their own they will pass the ownership onto another conservation group. In addition to helping conservation groups buy land, they help educate the public and community groups, such as the Boy Scouts, on responsibly maintaining the land so that they don't adversely affect the protected land surrounding them (Nantucket Land Council, n.d.).

2.2.3 Improving Accessibility at Nantucket Beaches

A vital part of the tourist experience on Nantucket are the island's beaches. According to the Basic Facts from the town's main website, the year-round population of the island is about 12,000 residents. The population of people who stay on the island longer than a week in the summer, increases to between 50,000 and 60,000 people (Town of Nantucket, Basic Facts, n.d.). Also, included with this large influx of people during the summer season are those with disabilities. As a result, it is important to consider whether the beaches on Nantucket are accessible to the those with disabilities and, if not, should be made accessible to accommodate individuals with disabilities. Appendix A.2 includes information on beach case studies.

The public beaches on Nantucket can be categorized by shore region. Located in the North Shore are Jettie's Beach, Brant Point, Children's Beach, and Dionis Beach. The East Shore includes Great Point and Siasconset Beach. The South Shore consists of Cisco, Nobadeer, and Surfside Beach. Lastly, located in the West Shore is the Madaket Beach (Jermain).

Jettie's Beach

Jettie's Beach, located just outside of town, as shown in Figure 6 is very family-oriented. The calm and shallow waters due to the protection of the Nantucket Sound have given the beach notoriety as being safer in terms of water play for smaller children (Jermain, n.d.). The beach is also located close to town with a good amount of parking. Different types of lessons and kayak rentals are also offered (Nantucket North Shore Beaches, n.d.). The number of commodities and amenities Jettie's Beach offers inevitably brings a large flux of people.



Figure 6: Beaches Directly Outside of Town (Google)

Children's Beach

Children's Beach, also shown in Figure 6, is similar to Jettie's Beach. Children's Beach is also on the north shore, protected by the Nantucket Sound, characterizing it with calm waters as well. Additionally, as its name implies, Children's Beach also revolves around youthful activities. These youthful activities include dance and yoga lessons. The Park & Recreation Commission also sponsors frequent activities that are put on at this beach throughout the summer months (Nantucket North Shore Beaches, n.d.). For example, three of the activities were yoga, a puppet show, and a soccer game (Children's Beach Schedule of Events 2016, 2016).

Brant Point

Brant Point (Figure 6) is much different from Children's and Jettie's Beach although it is located relatively close to them on the north shore. Due to the large number of boats traveling near this beach, water activity is usually not recommended. This beach is more fitting to capture photos of the Brant Point Lighthouse (the second oldest lighthouse in the United States) and watch the boats go by (Nantucket Island Chamber of Commerce, n.d.). Since the beach isn't as calm and doesn't allow easy water play, there is no lifeguard or amenities (Nantucket Island Chamber of Commerce, n.d.). Figure 7 shows the Brant Point Lighthouse.



Figure 7: Brant Point Lighthouse (Wikimedia, 2015)

Siasconset Beach

Siasconset (‘Sconset) Beach, Figure 8, is a less busy beach since it is six-miles from the center of town. Since the beach is further from town, the NRTA shuttle has a route to and from Sconset. There is a lifeguard at Sconset, however, the waves are rough, consequently, there are less swimmers than at Children’s or Jettie’s Beach (Nantucket Island Chamber of Commerce).

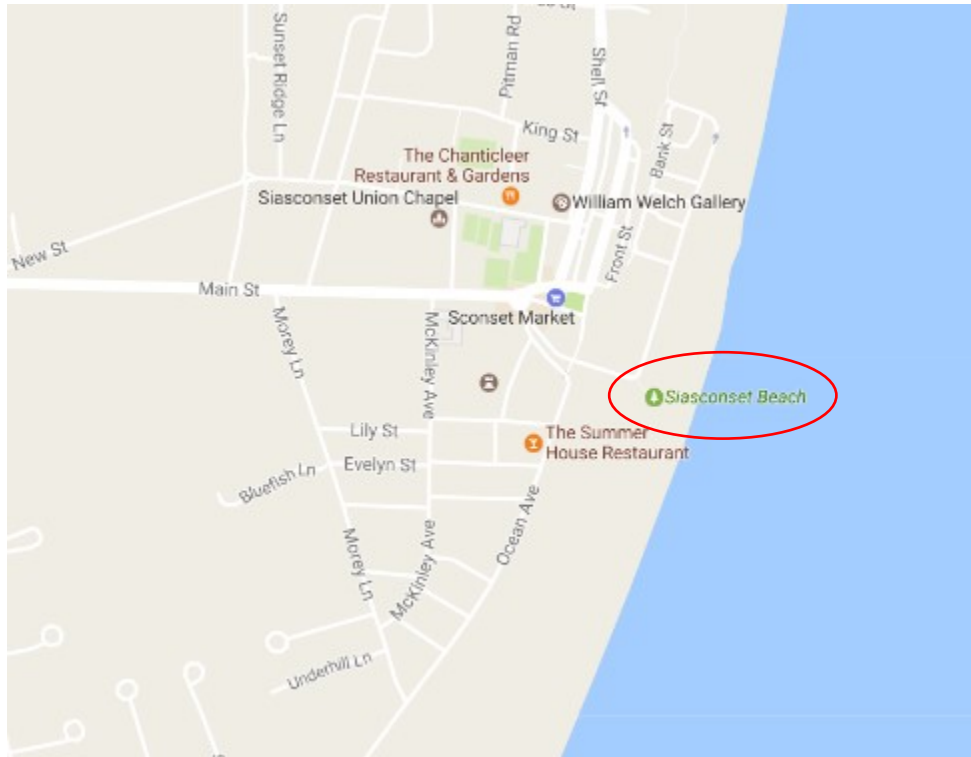


Figure 8: Siasconset Beach

Great Point

Great Point, as shown in Figure 9, is an isolated beach located at the most eastern tip of the island. The surf is very heavy at Great Point, and the sand is not very dense, making even walking access hard. In order to actually get to Great Point, a 4-wheel drive vehicle and a beach permit are required. Due to its limited access overall, there are no amenities at this beach (Nantucket South Shore Beaches; Nantucket Island Chamber of Commerce).



Figure 9: Great Point

Surfside

Although it is a 3-mile ride from the center of town and the waves of this south-shore beach can get rough, Surfside Beach is the most visited beach on Nantucket Island (Nantucket South Shore Beaches, n.d.). The beach is also very wide which makes it appropriate for recreational activities (Jermain). Since there are so many visitors who come to Surfside Beach, there are several amenities such as restrooms, parking, showers, a telephone, and equipment rentals. These amenities, however, Many Surfside Beach visitors go surfing and kite-flying on the beach (Nantucket South Shore Beaches).

In accordance to the popularity of Surfside Beach, it has been made accessible to people with disabilities. However, there is a large incline between the beach and the snack bar, making it more difficult for any disabled people to get food or a beverage (Nantucket South Shore Beaches).

Nobadeer Beach

Nobadeer Beach, also located on the south shore and typically is visited by young adults between the ages of 18 and 30 years old. There is commonly a food truck at the beach. Typical activities at Nobadeer include playing beach games such as lacrosse, or surfing the heavy waters. Unlike all other public beaches on the island, Nobadeer Beach allows automobiles on the beach. Very often one will find Jeep Wranglers playing a lot of music (Jermain, n.d.). There is a lifeguard at the beach because of the heavy surf (Nantucket South Shore Beaches). There are also no bathrooms at Nobadeer (Jermain, n.d.).

Cisco Beach

Similar to Nobadeer Beach, Cisco Beach, located on the south shore of Nantucket, has heavy surf and is mostly visited by young adults. The beach is great for surfing because of the heavy riptides. This beach, however, lacks facilities and in order to get there, a 4-mile drive is required (Nantucket South Shore Beaches, n.d.).

Dionis Beach

Although located on the northwestern shore, and not the protected north shore near town such as Jetties and Children's beaches, Dionis Beach is still somewhat protected by the Nantucket sound. With the waters being more calm because of the location, as well as the presence of a lifeguard during the summer, this beach is a good choice for swimming and other water activities. In terms of traveling to the beach, the most common method of transportation would be bike or car - the NRTA shuttle does not travel to Dionis Beach. There is a parking lot at the beach, however, there are no designated handicapped spaces. There are also bathrooms at the beach with ramps leading to them (Town of Nantucket, Beaches and Parks, n.d.).

Madaket Beach

Madaket Beach is on the western shore-line of the island. It is 5-miles from town center and the NRTA bus shuttle can also be taken to the beach (Nantucket South Shore Beaches, n.d.). Since the beach is located on the western side of the island, many visitors go to this beach to view the sunsets (Jermain, n.d.). Although the surf is heavy, there are no lifeguards and the beach is still popular throughout the day (Nantucket Island Chamber of Commerce, n.d.; Nantucket South Shore Beaches, n.d.).

2.2.4 Improving Accessibility at Nantucket Playgrounds

Major tourist destinations attract people from a wide range of ages. As a result, what people of different ages may want to do on vacation needs to be considered. When a family goes on vacation, they don't go to attractions only the parents would enjoy--a family makes sure to go do things their children would enjoy too. Yet, in order for families with children who have a disability to visit a playground, they must be able to utilize it with ease. A "boundless" playground is the type which allows children of all abilities to utilize (Brisco, 4).

The purpose of a boundless playground is to design a playground to minimize restrictions on play for children and also encourage the interaction between children with and without disabilities, giving rise to better knowledge and acceptance. Since boundless playgrounds have so many positive impacts, they are increasing in number. This rise in number wouldn't be possible without Boundless Playgrounds, Inc., a non-profit organization whose mission is to develop areas of play where all children are included and can fully engage in some of the

features the playgrounds have to offer. The company has partnered with several local communities that as of 2012, 27 U.S states combined had over 140 boundless playgrounds and Canada had dozens more under construction (Hartford Business Journal, n.d.). Appendix A.3 includes information on playground case studies.

3. Methodology

The goals of this project were to;

1. Assess the current accessibility at a majority of the trails, beaches, and playgrounds on Nantucket by creating a methodology for assessing each type of location and a database where this information could be easily accessed,
2. Provide recommendations for accessibility improvements at each area, based on our site analyses, detailed designs, models, background research, and stakeholder input,
3. Communicate the current accessibility features, as well as possible improvements, at each location to people with disabilities through the creation of multiple webpages where this information can be easily accessed.

Summary of Methods

The first step to achieve these goals was to conduct background research to learn the history of accessibility, legislature and guidelines on accessibility, other approaches or solutions to improving accessibility of the areas of interest, facts on Nantucket, and the current accessibility on Nantucket. To assess the current accessibility at each location, we created a methodology of assessing various trails in conservation areas, public beaches, and public playgrounds. The methodology included a comprehensive checklist for the development of an organized database. Next, we visited a wide range of outdoor areas and used the assessment checklists to gather data for each location. As we collected accessibility data, we prioritized each location using factors such as feasibility of renovation, popularity, distance from town, and cost of improvement. If a location had greater potential for accessibility improvements, and was more feasible to complete, it was given a higher priority. To help prioritize locations to select which to analyze more in-depth, further research on the island through interviews and surveys of the conservation owners and the islands' disabled and nondisabled populations was completed. To recommend accessibility improvements at each area, we analyzed the advantages of different design options based on the priority of locations. We compared these results to those in our case studies, (Appendix A), to develop greater insight on the best design options for improving accessibility in outdoor areas. Then, using photoshop, we created images of our prioritized and proposed accessibility improvement changes to present to the Nantucket Commission on Disability. Lastly, to communicate the accessible locations on Nantucket, we summarized the accessibility information in the form of a webpage to inform the disabled population on the outdoor areas we visited and their relative accessibility.

3.1 Detailed Methodology

The flowchart in Figure 10 illustrates our work to achieve our objectives. As can be seen in this figure, our methods were centered on four areas; background research, interaction with our sponsor, outdoor area assessment, and analysis. Through these areas, we interpreted our data to draw conclusions on the best accessibility improvements.

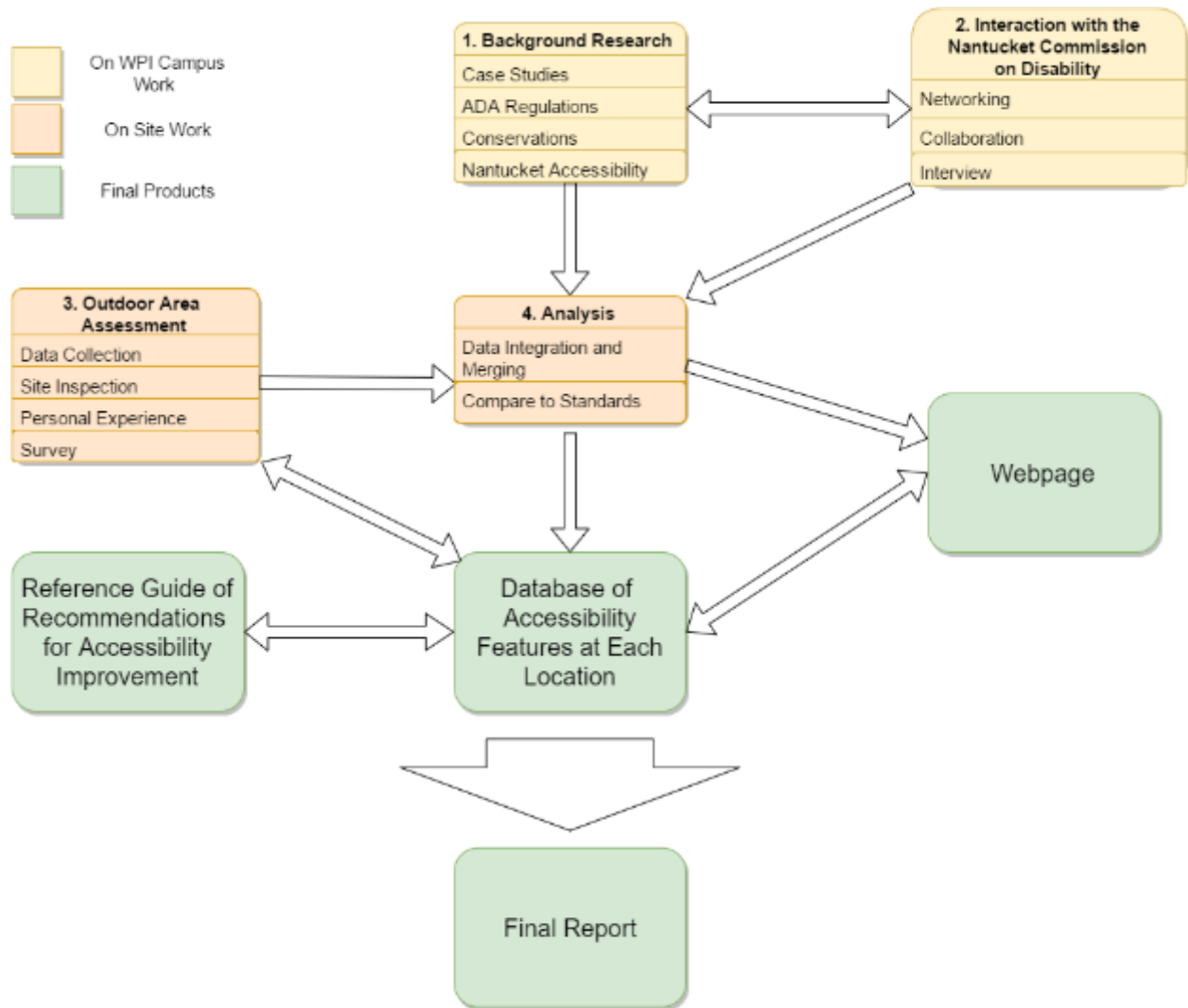


Figure 10: Work Flowchart

3.1.1 Background Research

The first step in our methodology was to perform background research on the definitions of disability and accessibility, understand the current state of accessibility in the United States – specifically the outdoor areas of Nantucket – learn about the applicable laws that govern accessibility, and research our sponsor, the Nantucket Commission on Disability. Each of these

areas of background research, as well as several others, are described in detail in Section 2., BACKGROUND.

3.1.2 Interaction with the Nantucket Commission on Disability

Through our background research, we gained further understanding on the role of the Nantucket Commission on Disability in the Nantucket community. After learning more from our sponsor about the current state of accessibility and the owners of the outdoor locations on the island, we decided on the specific objectives for this project and identified key stakeholders.

Identification of Stakeholders

After conducting background research and communicating with our sponsors, we created a list of stakeholders that were affected by or would have an impact on our project (Figure 11). As illustrated in Figure 11, stakeholders were categorized into four main groups; citizens, government agencies, private interests, and the environment. Also, in Figure 11, each of the four main categories are further divided into the specific sub-groups we identified as possible stakeholders in our project. These sub-groups are not necessarily people, but could also include flora, fauna, published recommendations and reports, and laws. For example, underneath government agencies the ADA and ABA are listed as stakeholders even though they are legal requirements.

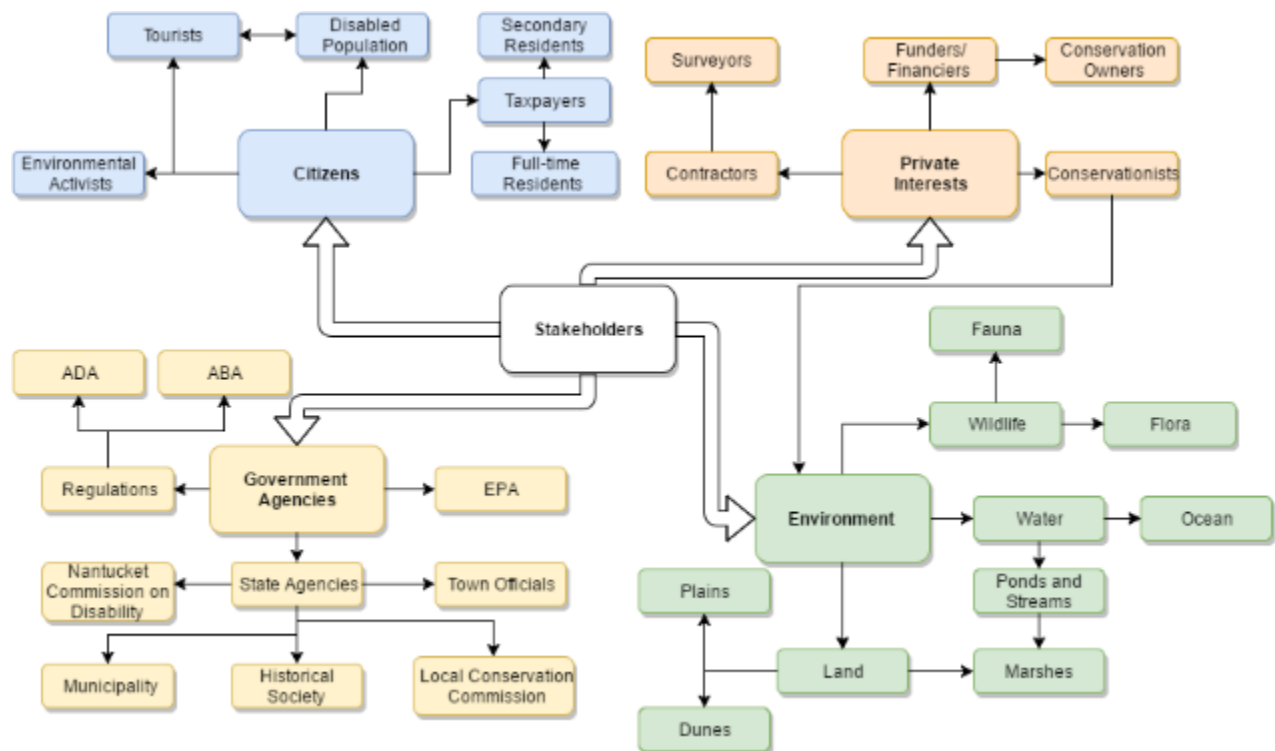


Figure 11: Stakeholders

After identifying our stakeholders, we decided on key groups and individuals to interview and survey – such as the conservation groups and prominent members of both the disabled and non-disabled communities. We conducted these interviews and surveys to expand our knowledge in different areas of interest. Examples of these areas include the most popular areas to visit, which locations needed the most improvements, and if conservation owners were willing to aid in the renovations. Complete details on the development of our surveys and interviews are described in our results section (4. RESULTS). A sample of interview questions can be found in Appendix D.5.

3.1.3 Outdoor Area Assessment

In Figure 12, a streamlined process for evaluating accessible parks and planning improvements is shown (Accessible Parks and Trails Assessment Toolkit Appendices A-E). As demonstrated in Figure 12, there are four main steps: plan, assess, analyze, and act. In our methodology, we adopted the first two steps, plan and assess, to help us develop a method for assessing outdoor locations.

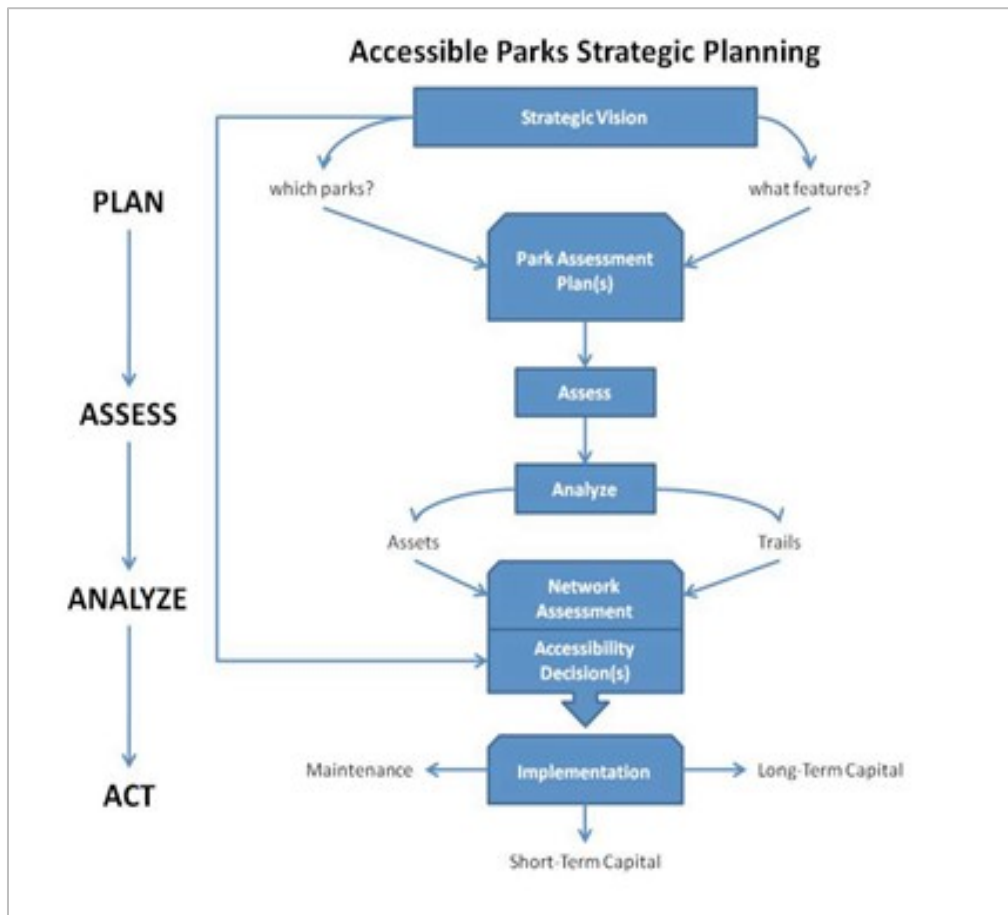


Figure 12: Accessible Parks Strategic Planning (United States Department of Justice, n.d.)

We also modified the plan to be specifically applicable to the assessment of trails, beaches, and playgrounds on Nantucket. The plan was modified because the checklist and plan only applied to physical disabilities, and we were also interested in assessing locations for sensory and cognitive disabilities. Starting with our modified checklist, our method for assessing the accessibility of each site followed a general series of steps;

1. Create a checklist of features and amenities to measure and observe at each location based on published standards
2. Identify appropriate sites to visit for each type of checklist/plan (trails, beaches, playgrounds)
3. Visit sites and make appropriate measurements, take pictures, etc.
4. Transfer data into a database
5. Compare results from each visited location to published standards and recommendations
6. Draw conclusions for accessibility by different type of disability, make recommendations, prioritize, etc.

Using the results gathered from this process, our background research, and case studies we then proposed and documented both short term and long term accessibility recommendations. Designs were developed for select locations that would enhance accessibility for specific types of disabilities. These designs were visualized using photography of the specific location and overlying 3D models of our ideas. In addition, we provided a rough cost estimate and timeline of each recommendation.

Assessing Trails

To assess trail accessibility, we used recommended toolkits and checklists adapted from the Universal Trail Assessment Process and sections from the Report on Accessible Parks and Trails in British Columbia (The Universal Trail Assessment Process, 2004; Accessible Parks and Trails Assessment Toolkit Appendices A-E, 2008). Recommended toolkit items we used for assessment included;

- a measuring tape,
- a rolatape,
- an inclinometer, and
- a rangefinder.

Using the resources mentioned above and on-site photography, we determined what accessible amenities are currently at the property and which are missing. Examples of parameters measured or evaluated at these locations included: grade, slope, and width of the trail, number of accessible parking spaces, signage, and numerous other quantitative and qualitative parameters. We also used a Google street-view backpack camera or “trekker” to take panoramic images of select trails. These images will better illustrate to visitors what the locations currently look like (Google, n.d.). As we collected data for each site, we created a database detailing the features we

found at each location. We compared this data with the standards set by the ABA, ADA, and state laws, found in Appendices D.1 and D.4. The exceptions that exist for these standards are listed in Appendix D.4 and apply to all ABA standards referenced in this paper.

Assessing Playgrounds

To assess the accessibility of playgrounds, we used photography and a public playground accessibility checklist developed by GameTime, a company that manufactures boundless playgrounds (Appendix D.2; GameTime, n.d.). Some accessibility features we looked for and measured were: accessible ground surfaces, ramps, and accessible walkways. We then took our data and entered it into a database to compare to ABA and ADA accessibility standards as well as state laws, which are in Appendices D.2 and D.4.

Assessing Beaches

In our research, we found no recommendations for assessing beach accessibility. As a result, to assess beaches, we used photography and basic principles from the previously noted assessment guidelines for trails and playgrounds. ABA standards for beach access routes were also referenced, and the guidelines were merged in the most effective way for assessment. The exact list of features and measurements that we took can be found in Appendices D.3 and D.4. After collecting data at each location and converting it into a database, we compared it to the standards mentioned above.

3.1.4 Analysis

After we assessed each location, the data was compared to accessibility standards established by the ABA, ADA, and state laws (Appendices D.1 and D.4) to determine which features of the outdoor areas already meet accessibility standards. The results of this comparison were compiled with information gathered through surveys and interviews. Information, such as a ranking of the most popular outdoor locations, helped determine which sites should be the highest priority for accessibility improvements. Subsequently, we determined what the best short term and long term improvements are at each location based on a cost benefit analysis. This analysis included: items needing improvements, popularity of the location, extensiveness of needed accessibility improvements, and willingness of the property owner to improve accessibility. Once we completed our site-specific analyses, we created a ranking of the sites from easiest and most economically feasible, to the sites that will be very difficult to improve the accessibility.

3.1.5 Final Products

Based on the current accessibility of each location we assessed, the first product we provided the Nantucket Commission on Disability was a database containing site survey spreadsheets with access measurements and observations for each assessed location.

Next, we produced a detailed accessibility reference guide containing images, findings, short and long term recommendations to improve the accessibility at each outdoor area for a variety of disabilities.

The third product we presented to the Nantucket Commission on Disability was multiple webpages detailing all of the currently accessible outdoor locations we assessed. On one webpage, the select locations that are currently accessible are pin-pointed on an interactive map of the island, with descriptions of each property and their accessible features appearing after clicking on the pins. NCOD can update the descriptions once a new accessible feature is installed. Another webpage has information on helpful resources for those with disabilities traveling about the island, such as beach access wheelchairs and special taxis designed for disabled visitors.

Lastly, we produced a final report detailing all of our background research, case studies, methodology, results, and conclusions made from our project.

4. Results and Recommendations

The purpose of this section is to communicate our findings, results and recommendations. We will demonstrate the common conditions and unique features relative to accessibility noted at the assessed locations based on the protocol from the templates (Appendix C) and photos we captured. All collected data from each location can be found in the Assessed Locations Database. All observations, short and long term recommendations for each location can be found in the Reference Guide of Assessed Locations.

Comparing and contrasting locations to each other helped indicate what accessibility features are commonly present and absent at conservation areas, beaches, playgrounds, or “other locations”, where “other locations” are properties that could not be classified by one of the three former categories. The recommendations for assessed locations were developed referencing the Massachusetts Architectural Access Board (MAAB) state code and standard measurements set by the Architectural Barriers Act (ABA) and the Americans with Disabilities Act (ADA) in addition to our conducted background research on past accessibility solutions, and design options.

In the following subsections, we demonstrate specific findings and propose more extensive potential solutions for five specific locations: Bamboo Forest, Dionis Beach, Children’s Playground, a Possible Bench Location near Sanford Farm, and the 1st Crabbing Location on Madaket Road. These properties were selected considering the ease of being granted permission by the owners, the economic impact, and the intensity of the labor required to implement the recommendations for accessibility improvement.

4.1 Conservation Areas

For all of the conservation areas we visited, we first describe general findings, followed by short and long term recommendations that were common at many locations. Also, detailed findings, short, and long term recommendations for one selected conservation area are explained.

4.1.1 General Findings

Common features found at conservation areas include;

- Dirt, grass, sand, or gravel parking lots
- Absence of designated accessible parking
- Uneven trails
- Absence of benches
- Absence of bathrooms
- Obstructions in entrances

In the conservation areas that we visited, the parking lots were surfaced with grass, dirt, sand, or gravel and did not provide designated accessible parking.

Another finding was that all of the assessed locations had trails that were very uneven and were composed of dirt or grass. These surfaces would cause issues for those with an ambulatory disability as it would be very difficult to travel over these types of terrain.

We also noted that 9 out of 11 of the conservation areas did not have benches anywhere on the property.

Only one of the visited locations had a restroom but the building it was located in was not accessible.

Two of the locations included accommodations for people with sensory or cognitive disabilities. For example, the Linda Loring Foundation, as seen in Figure 13, has posts along the trail that collectively tell a story which is something an individual with hearing impairments can easily utilize.



Figure 13: Linda Loring Trail (Edwards, 2016)

Lastly, two of the properties we visited had posts or gates obstructing the entrances. Below, Figure 14 demonstrates the turnstile at the entrance of Sanford Farm that makes it difficult for those with mobility assisting equipment to get through.



Figure 14: Turnstile at Sanford Farm

4.1.2 Detailed Findings for Bamboo Forest

This section provides a detailed review of the area known as Bamboo Forest (Figure 15), located about one mile outside of town off Madaket Road. Bamboo Forest has a parking lot and trail surface that is relatively level and leads to a picnic table with a nice view, but the trail still has potential to be improved. General observations of this conservation area include the following;

- Parking lot surface is level
- Trail surface is mostly level
 - Periodic ruts in trail
- Trail width meets ABA standards
- Picnic table present
- No accommodations for sensory or cognitive disabilities



Figure 15: Bamboo Forest

We found that the first part of the trail is in fairly good condition, but portions of the trail would need repair to be considered accessible. For example, one of the ruts in the trail was measured to be 5” deep making wheelchair travel difficult. These ruts are caused by rain runoff which indicates that the trail surface is not stable and does not meet ABA standards (ABA 1017.2). The main part of the trail, however, is already over 36” wide, exceeding the ABA standard for trail width (ABA 1017.3). Currently, a wheelchair user who is young and strong might be able to traverse the trail, especially if they are experienced in traveling over surfaces other than pavement. The trail leads to a picnic table about 30 feet away, but it is not a wheelchair accessible table as there is no room for a wheelchair to pull up to the table. Also, there are no accommodations for those with sensory or cognitive disabilities.

4.1.3 Conservation Area Recommendations

Recommendations were classified as either “short term” or “long term” according to the likelihood of implementation, the estimated cost of the repairs or installation, and the time required for implementation.

Short Term Recommendations

Our general short term recommendations for conservation areas are;

- Designate accessible parking spaces
- Level the parking lots
- Add benches

We recommend the designation of accessible parking with proper signage included. The parking lots can be leveled out using a crawler (continuous tracked tractor).

We also recommend the installation of benches that will allow those with disabilities to rest or take in a nice view while exploring the properties. These benches will have to be maintained so that they do not fall into disrepair. The benches should include backs and armrests that provide support for those with mobility disabilities (ABA 903).

These short term recommendations are more likely to be approved, more cost effective, and less labor-intensive. However, they will not make the conservation areas as accessible as the long term recommendations.

Long Term Recommendations

The following long term recommendations can be implemented at conservation areas;

- Resurface parking lots
- Level and resurface trails
- Add stable foundation beneath benches
- Install post-and-rope guide systems

The parking lots of all the trails should be resurfaced with a hard-packed surface such as pavement or stone dust. A stone dust surface is shown in Figure 16. If it is not possible to pave the designated parking area, then it should be made as level and hard-packed as possible with minimal water pooling, similar to the temporary parking requirements in MAAB 23.4.4. It is required by MA state code to inform the public where these designated parking spaces are through signage (MAAB 23.6), and to make sure they are close to the entrance to the trail (MAAB 23.3.2). This allows visitors with disabilities to not have to travel an unnecessarily long distance to the point of interest at these conservation areas.



Figure 16: Stone Dust Surface

The trails could also be leveled with a crawler (continuous tracked tractor) or remodeled with accessible materials. These repairs would have to be maintained to make sure they remain in good condition. For example, a drainage system may need to be put in place to make sure that storms will not wash away the new materials (Mass Audubon 9).

Benches would be more accessible with a foundation beneath it composed of an accepted material, such as pavement or stone dust. We recommend extending the base a few feet from the bench so that those in wheelchairs can rest next to the bench with friends or family members.

A long term recommendation applicable to 4 out of the 11 locations is to implement a post and rope guided system. For example, the Linda Loring Foundation could be improved with a post-and-rope system installed along the side of the trail. This is a valuable resource for those with sensory impairments, because this allows them to self-guide themselves through the conservation area. The posts can be used to demonstrate interesting features at the location such as sensory elements like feeling the different types of tree bark and stopping to listen for a specific bird call. The ropes can have beads or markers on them to alert someone that there is a post with text or a sensory feature coming up. Figure 17, below, shows a post and rope system on a property of the Massachusetts Audubon Society.



Figure 17: Notification Bead on Post and Rope Guidance System

Not all of these recommendations are applicable to each conservation area. Each trail has its own terrain and solutions would need to be specialized accordingly. This is why we developed more in-depth recommendations for five specific locations. The conservation area we decided to analyze more extensively was Bamboo Forest.

4.1.4 Detailed Recommendations for Bamboo Forest

In this section, short and long term recommendations to improve the accessibility at Bamboo Forest are explained.

Short Term Recommendations

The following are potential solutions for Bamboo Forest that can be implemented in less time;

- Designate handicapped parking
- Accessible access route to the trail
- Add a bench
- Implement different style bench

The addition of a designated handicapped parking spot with an accessible access route leading to the trail allows the parking lot to accommodate anyone with a disability. These improvements enable those with disabilities to travel the shortest distance possible to the entrance.

To add accommodations for wheelchairs we recommend adding a bench at the top of the hill with a firm and stable area next to it for someone in a wheelchair to rest next to their companions or even a small child in a stroller. This would also provide a resting area for those who cannot walk for a long distance.

In addition, at the top of the hill we would recommend adding a wheelchair accessible picnic table. These do not cost much more than a normal picnic table and only require a small level area around the end and an overhang so that one can be rolled up to the table or a table similar to the one shown in Figure 18. This would allow someone in a wheelchair to enjoy a meal with their friends or family at the same table.



Figure 18: Wheelchair Accessible Picnic Table

The implementation of these recommendations would improve Bamboo Forest’s accessibility, however, there are more options that can increase the degree of accessibility even further. These options are differentiated by their higher costs, more intensive labor, complexity, and the required time investment.

Long Term Recommendations

The long term recommendations for Bamboo Forest include;

- Resurface parking lot
- Resurface trail/ install drainage system
- Implement historical information sign in bamboo
- Add tactile sample of bamboo

A parking lot with the proper surface (paved or hard-packed according to 521 CMR 23.4.4) would allow someone with disabilities—especially those in wheelchairs—to move from their vehicle to the trail entrance with ease.

A long term recommendation is a complete remodel the trail surface by replacing it with stone dust or an equivalent surface and leveling the trail. This would allow those with mobility disabilities to explore this location easily and without assistance. If replacing the entire surface of the first portion of the trail is not feasible, a second option of creating a drainage system that

would protect the dirt of the trail from being washed away would increase the lifetime of the trail.

To help people with visual and hearing impairments we would recommend placing some signs in the bamboo grove and at the top of the hill that give a bit of information about the history of the grove, the surrounding area, and the flora and fauna of the property. The signs should include Braille text of the same information. Figure 19, below, is an example of a sign at Broad Meadow Brook in Worcester, MA—a property owned by the Massachusetts Audubon Society.



Figure 19: Broad Meadow Brook Sign

Also, a post-and-rope guidance system could be installed to further assist the visually impaired. The sound of the bamboo in the wind is a unique sensory experience and there could be a marker indicating they could stop and listen. There could also be a tactile sample of the bamboo itself and an audio clip of the sounds the bamboo makes during a breeze for when it is a windy day. This audio clip could be made available online.

To increase the accessibility on Nantucket, beaches were also assessed and analyzed to aid in the development of quality short and long term recommendations for the improvement of the public beaches on the island.

4.2 Beaches

The following section communicates our findings and recommendations for assessed beaches. We note the common conditions and features of the beaches. We also propose and explain more extensive potential solutions for Dionis Beach.

4.2.1 General Findings

General findings for beaches were;

- Parking lot surfaces varied
- Paved parking lots had accessible parking spaces
- Beaches lacked accessible bathroom buildings
- Entrances have good width but too steep of slopes
- No permanent surfaces for access routes from beach entrances
- Sand and surf varied with region beach is located in

The parking lots had varying surfaces including loose gravel, loose sand, and pavement. We found the farther the beach was from town, with the exception of Surfside Beach, the parking lot was less likely to be composed of an accessible material. For example, Children's Beach and Jettie's Beach, located within town, were both paved. In contrast, 'Sconset Beach located approximately 8 miles from town, has a parking lot composed of sand. Although Surfside Beach is about 3 miles from town, we concluded the beach has a paved parking lot because of its popularity.

When a parking lot was paved we found it was more likely to have designated accessible parking spaces. Surfside, Children's, and Jetties Beach all have paved parking lots with 103, 15, and 85 spaces respectively and also have designated accessible parking. One exception, Cisco Beach, has one designated accessible parking space despite it having a compact dirt parking lot. The number of designated accessible spaces at Surfside, 4, was not compliant with MA state code (MAAB 23.1).

Out of the eleven beaches assessed, only four had accessible bathrooms. Parts of the ramps at Surfside, Children's, Dionis, and Jetties Beach, did not meet the MAAB state code concerning the ramps' running slope, cross slope, and landing clear length. For example, the running and cross slopes of the ramp to the bathrooms at Surfside Beach are 5 and 2 degrees respectively. The maximum incline the running slope can be is 4.76 degrees, and the maximum cross slope is 1.15 degrees (MAAB 24.2.1 and 24.6).

The majority of the beach entrances are of adequate width (60 inches) to be compliant with the ABA standards. The majority of the running and cross slopes of the assessed beach entrances do not meet these standards. For example, at one segment of the Nobadeer Beach

entrance, the running slope is 7 degrees which is 1.26 degrees too steep to meet standards (ABA 1017.7.1).

We found that none of the beaches had boardwalks in place. The only access solution implemented at a beach was the access mat at Jetties Beach. Many of the beaches did have metal ramps to assist access to the beach but were not designed for wheelchair use. These beaches included Madaket Beach, Children's Beach, Dionis Beach, and Cisco Beach. A few other may have metal ramps seasonally, but there were none at the time of assessment. The terrain at the beaches demonstrated that these ramps were vital. Cisco Beach, for example, has a steep drop off after the parking lot as shown in Figure 20. While the ramps are helpful for those without mobility impairments, they are restrictive for those who need any assistive equipment such as a wheelchair or a walker.

Most of the beaches assessed consisted of loose sand with fine grains. The south shore of the island especially had finer sand. For example, Cisco and Nobadeer Beach had finer sand than at Madaket Beach. This was significant to determine because it indicated how easy it is for the tide to create shelves in the sand at some beaches in comparison to others (Pilkey, n.d.). The nature of the surf also contributes to this phenomenon. The heavier, or more rough the surf, the bigger we found the shelves to be. The surf on the northern shore seemed to be the calmest while the surf on the south and southeastern shores of the island was very heavy.

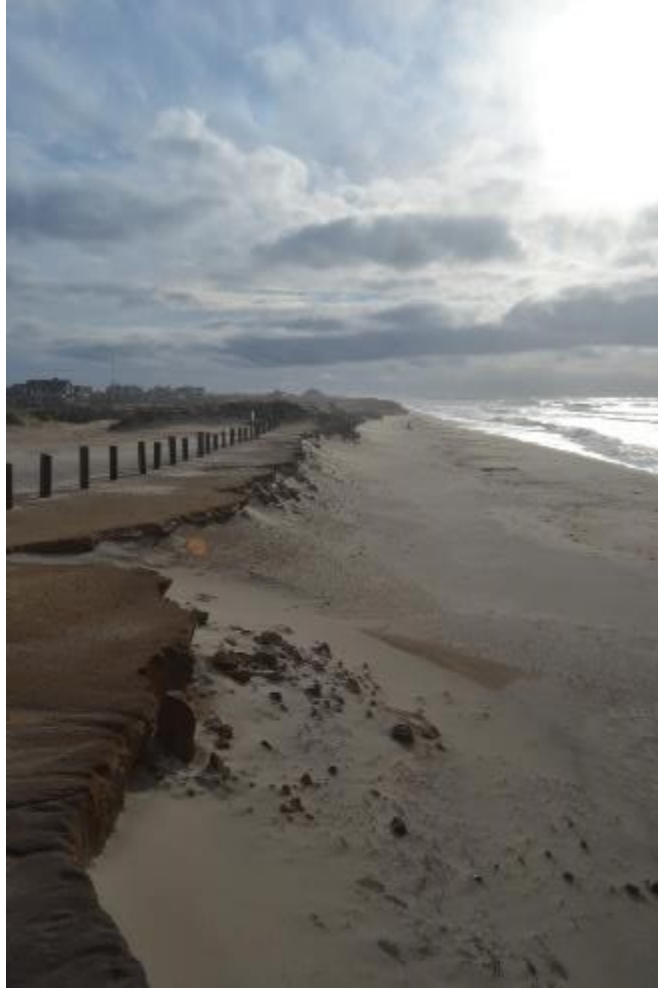


Figure 20: Erosion at Cisco Beach

4.2.2 Detailed Findings for Dionis Beach

Located on the northwestern shore, Dionis Beach is still somewhat protected by the Nantucket sound. The waters are more calm because of this location, and the beach has a lifeguard during the summer. This makes Dionis Beach a good choice for swimming and other water activities. Findings at Dionis Beach include;

- Hard-packed gravel parking lot
- No designated accessible parking spaces
- Accessible bathroom building with showers
- Temporary metal ramp for sand
- Post-and-rope handrail along beach access route

The surface of the parking lot of Dionis Beach is hard-packed gravel. By biking over this parking lot, we noticed the surface is compact and doesn't conform as much as sand. However,

the hard-packed gravel is still vulnerable to washout and erosion. With vehicles frequently driving over and parking on the lot, ruts and divots have formed. Ruts in the parking lot has created an uneven surface, which is difficult for people with disabilities to traverse over. Currently there are no signs designating any areas to be reserved for those with disabilities.

Adjacent to the parking lot is a building with bathrooms and showers. The outside of the building is accessible with two ramps that end at the bathroom entrances. The first landing platform after the first ramp is large enough with dimensions of 63” by 10’. The second landing platform, however, is only 52” by 54”. The minimum clear length for ramp landing is 60” (MAAB 24.4). The rest of the measurements of the building’s railings and ramps all were compliant with the standards. However, the first ramp landing is overgrown with grass.

Tucked behind the bathroom building we found another metal ramp with treads (Figure 21). It is unclear where this metal ramp is placed during the summer months. From our observations, we speculate the ramp is placed towards the beachfront on the other side of the dune rather than the beginning of the pathway on the parking lot-side of the dune. Similar to the metal ramps found at other beaches on the island, the measured length of the ramp is 25’ long.



Figure 21: Ramp at Dionis Beach

The pathway to the beachfront goes up and over the dune that exists in between the parking lot and the beachfront (Figure 22). The pathway is 300 feet of loose sand and runs at a steep incline. There is a post-and-rope system comprised of wooden posts that are connected by rope. The rope helped maintain footing while walking up and over the dune. Due to the loose sand, it would additionally be difficult for anyone using a cane, walker, or wheelchair (unless a

beach wheelchair) to use the pathway because the equipment does not remain on top of the sand and instead sinks into it.



Figure 22: Pathway to Water at Dionis Beach

At the end of the pathway, the sand leads down to the shore at a gradual decline. The granules of the sand are also less fine than the ones found in the pathway. It was also found that the surf is very calm in comparison to other regions of the island, such as the south shore, due to the protection of the Nantucket Sound.

4.2.3 Beach Recommendations

This section will present general short and long term recommendations for beaches.

Short Term Recommendations

The following are short term recommendations for beaches;

- Designate accessible parking
- Level the parking lots
- Implement Braille signage (for restrooms, cafes, entrances, etc.)

We recommend the designation of more handicapped parking spaces. The only required actions that need to occur for this change is the installation of proper signage and possibly the

resurfacing of the specific spaces. The implementation of accessible parking significantly improves access for people with disabilities because it is one of the first concerns they have when travelling somewhere (MAAB 23.1).

To increase ease of access, we recommend leveling out the parking lots. The economic factor for this would not be great initially, however, this would have to be a regular task so that the parking lots would remain level.

We also recommend a temporary beach ramp similar to those currently used but without treads to allow people with assistive equipment like wheelchairs and walkers to access the beach. The ramp should sit high enough above the sand so that it doesn't continuously collect on the surface. If the ramp has handrails, this and the lip on the sides of the ramp will prevent an individual from falling off.

If a permanent access path, or one that is rolled out (i.e. a MobiMat like the one at Jetties Beach), cannot be implemented a post-and-rope system for people with disabilities to hold on to is the next best solution.

We recommend installing benches in the parking lots of the beaches for people that don't want to go all the way down a pathway to the beachfront, but rather sit and enjoy the view of the beach from the parking lot. Bench seating on an already-flat section of land gives visitors the opportunity to sit and rest while still being able to enjoy the beach. It is recommended that the benches have back support and arm rests to give those with disabilities a surface lean back and rely on, as well as a support to push off of to get up.

A feature that could be helpful, but would be considered a lower priority, is additional signage with Braille. These signs would indicate where the bathrooms, cafés (if applicable), and entrances are located. It is also recommended for there to be signage alerting of any hazards present at the beaches.

Long Term Recommendations

We developed the following general long term recommendations for beaches;

- Resurface parking lots
- Build designated accessible parking
- Build accessible bathrooms
- Construct viewing platform
- Install improved access route

We recommend paving or resurfacing the beach parking lots. This is an appropriate design solution only for beaches that do not have a rapid erosion rate. For example, Cisco, Tom Nevers, and Nobadeer Beach may not be worth considering for this improvement because it would be a matter of years before the pavement is disturbed by erosion.

We also recommend installing bathrooms for people with disabilities to give them the ability to enjoy the beaches for a longer period of time. Once these bathrooms are installed, there

needs to be regular maintenance to ensure the use of them will not be limited or that their condition will not deteriorate.

Rather than the installation of a bench on a portion of land that is already level, we recommend the implementation of a viewing platform. The difference between a viewing platform and a bench is a platform is made of a wooden surface with lipped edges and sits above the ground, whereas a bench can be made of a variety of materials and is screwed into the ground. It is important to note, however, that the creation of a viewing platform could be a challenge as it may require the reconstruction of the land it is built on.

We recommend implementing access routes with accessible surfaces leading from a beach parking to the beachfront. A boardwalk with wooden planks provides a stable path for someone with disabilities to travel on (ABA 1018.3). A boardwalk comprised of metal sheets that are assembled and can snap into each other can be both temporary and permanent. The metal material creates enough friction that it doesn't slide, yet it also doesn't conform to the sand beneath it due to the metal's rigidity.

To be paired with these boardwalks, a post-and-rope system should be considered if regular wooden handrails are not (Mass Audubon 25). The rope-guided system would provide assistance to those with disabilities, especially those with sight impairments down the pathway, to the beachfront.

4.2.4 Detailed Recommendations for Dionis Beach

In this section, we will explain our detailed recommendations for Dionis Beach as an example of accessibility improvements and conditions at a specific beach.

Short Term Recommendations

The following are short term recommendations for Dionis Beach;

- Add designated accessible parking spaces
- Flatten the current parking lot
- Maintain surrounding vegetation
- Extend the post-and-rope system

We recommend the establishment of designated accessible parking spaces. The designated spaces would be implemented to the sides of the pathway entrance or next to the bathroom so the distance anyone would have to travel to reach the pathway or bathrooms would not be extensive. The spaces would be clearly indicated by the installation of signs.

In addition, the parking lot should be leveled out. This change would need to be maintained to ensure the parking lot doesn't fall into disrepair.

We also recommend cutting back the overgrown grass around the bathroom building as shown in Figure 23. The overgrown grass is invading the ramp, which should remain clear of any

obstructions. We also recommend that additional signage be added around the bathroom building to indicate the presence of bathrooms.



Figure 23: Overgrown Grass Around Bathroom at Dionis Beach

We recommend the extension of the post-and-rope system already present. The post-and-rope system can also be made to accommodate those with sight impairments by implementing the blocks that notify anyone of an obstruction or change in the path (Mass Audubon 25).

Long Term Recommendations

Substantial differences in the accessibility of Dionis Beach’s accessibility can be made through the following long term recommendations;

- Resurface the parking lot
- Implement a wheelchair access path from the parking lot to the beach
- Construct a viewing platform for wheelchair use

We recommend replacing the current gravel with stone dust or pavement. Pavement, specifically, has a strong resistance to washout but is susceptible to frost heaves.

We also recommend the implementation of a boardwalk of either wooden planks or metal sheets that remain in place but do not conform to the sand to make the pathway easier to travel

over. The combination of a more stable surface for the pathway and the post-and-rope system would create a safer, more accessible access route especially for those with sight impairments and with ambulatory concerns.

Midway on the beach access route we recommend installing a viewing platform, similar to the one shown in Figure 24, to provide visitors with the option to sit and enjoy the view of Dionis Beach. This addition would be built atop the dune at its crest. The appropriate material, similar to the pathway, would be either wooden planks or metal sheets. It is important to ensure the platform also has curbs around the edge in addition to a handrail. This addition should also include a bench to allow people with ambulatory concerns to rest and view the landscape. Below, in Figure 25, is a diagram which illustrates our recommendations.



Figure 24: Viewing Platform (Viewing Platform at Pismo Beach, n.d.)



Figure 25: Dionis Beach Recommendations

4.3. Playgrounds

The following section presents our findings and recommendations for playgrounds. We will show the common accessibility features as well elements that do not meet standards. We additionally propose more detailed potential solutions for one selected location, Children’s Playground.

4.3.1. General Findings

After completing the assessment of the Winter Park, Tom Nevers, Children's, Jetties, and Sconset Playgrounds, the common findings include;

- Parking lot surfaces vary
- Number of parking spaces and accessible parking spaces vary
- Parameters for playground entrances meet standards
- Surfaces of all playgrounds are sand
- Inaccessible motor play present
- Many benches present

The surfaces, number of parking spaces, and presence of designated accessible parking varied among assessed playground parking lots. The parking lot surfaces are the most consistent of all the parking lot data. We observed 3 out of the 5 playgrounds had parking lots that were already paved. Tom Nevers and Sconset Playgrounds have parking lots composed of loose dirt or sand and gravel. Similar to other playgrounds, Tom Nevers and Sconset Playgrounds share a parking lot with the beach it is located at. The distance between the parking lot and the Sconset playground is greater than the distance between other playgrounds and their respective parking lots.

The number of feasible parking spaces in the playground parking lots varied as well. For example, at Jetties Playground there are only 85 parking spaces with 4 of them designated as accessible. In contrast, Winter Park, also located within town, only has 8 parking spaces with 1 being accessible.

There was a correlation found between the distance of a playground from town and the surface of the parking lot. Winter Park, Children's Playground, and Jetties Playground are all located within town and are paved. In contrast, Tom Nevers and Sconset Playgrounds are located on the southern and eastern shores of the island respectively are not paved nor do they have designated accessible parking. This data demonstrates that the closer to town the playground is, the more likely it is going to have paved parking. Without designated parking spaces, or a smooth, even surface, the parking lot limits people's ease of access to the playground.

The entrances to every assessed playground were of adequate width, running slope, and cross slope. The only exception was the running slope of the Winter Park Playground entrance which can be relatively easily brought into compliance.

The majority of the playgrounds do not have access routes throughout the play area. Only Sconset Playground has them connecting the entrance and play structures. Currently, the surface of the play areas at all of the playgrounds are sand, which is not accessible.

Most of the play component measurements are compliant with the standards set by the ADA. The transfer systems (i.e. stairs designed for accessibility) especially have adequate dimensions (Figure 26).



Figure 26: Transfer System on Play Structure at Tom Nevers Playground

We also note that all five playgrounds had multiple play components that are considered motor play and help exercise children physically. For example, we observed play components such as slides, monkey bars, climbing walls, poles to slide down, and swings. Most of this motor play is not easy or safe for children with disabilities to use. Many of the components are elevated high above the ground and require a lot of strength to use properly as shown by the monkey bars at Tom Nevers Playground in Figure 27 below.



Figure 27: "Monkey Bars" at Tom Nevers Playground

Sconset Playground has transfer systems and other motor play components that are easier to use. For example, in one of the play structures there is a short, angled rock wall that leads to the elevated platform in addition to the transfer system as seen in Figure 28. Since Sconset Playground is ADA compliant, it has many other accessible elements which we use as references when assessing and analyzing the other playgrounds.



Figure 28: Sconset Playground Rock Wall

Every playground we assessed has at least one component that exercises the senses. Many of these sensory play components stimulate the sense of touch. For example, Sconset Playground has two pipes located on the wall of the Sankaty Lighthouse structure that are meant to pour sand in and out of, as shown in Figure 29. When children use this element, they experience the feeling of sand running through their fingers.



Figure 29: Sensory Element at Sconset Playground

We also found sensory play components that exercises the sense of hearing. Located at Tom Nevers Playground, there are two telephonic ends resembling speakers on a pipe situated on opposite ends of the play structure. This feature allows children to communicate to one another through speech. We noticed at least one sensory element at each playground. Below in Figure 30, is an example of the “talk tubes” at Winter Park, located just outside of town.



Figure 30: "Talk Tubes" at Winter Park

Every playground we evaluated had one or more benches surrounding the play area. These benches varied in material, arm rests, and back rests.

4.3.2 Detailed Findings for Children's Playground

Children's Playground, located on the north shore of the island and within the town harbor, has accessible features, however has potential to be improved. A summary of our findings at Children's Playground includes;

- Two wide entrances
- Play area surface is sand
- Play area is level
- Play component measurements meet standards
- Sensory play present on smaller play structure
- 2 benches present
- Bathroom and café in building adjacent to playground

As we walked along the pavement pathway leading to Children's Playground, we first noticed the two wide entrances to the play area. The two entrances are designated by the break in

the wooden barrier that is approximately 1.5 ft. tall. Without measuring the entrances, it was evident they were of adequate width to accommodate wheelchairs as shown in Figure 31. The entrances were approximately 5 ft. in width.



Figure 31: Playground Entrance at Children's Playground

We found the entire playground surface is sand. Despite the material of the surface not being level, the land beneath the sand is flat, making it easier to alter the play area surface. There are no access routes within the play area that run between the playground entrance and the play components, as well as between the play components themselves. This is inaccessible to people with disabilities because the only way to get to these components is by traveling over sand. The area of the entire playground is not too large so the distance between the structures as well as the entrances is not extensive. All of the transfer system dimensions were compliant with ADA standards. For example, the height of the steps were 8 inches and the area of the steps in the transfer systems were 25" by 14.5". The platform dimensions were 3' by 3' which is an adequate amount of space to move around between elevated play components.

The smaller play structure has one sensory play component. It consists of the outline of the United States embossed into a plastic sign bolted to the top landing of the structure as shown in Figure 32.



Figure 32: Sensory Element at Children's Playground

The quantitative data we collected for the smaller structure was similar to the larger structure. All of the dimensions for the structure's transfer system met requirements and the platform dimensions were similarly measured to be 3' by 3'.

Close to the small structure and around the perimeter of the playground are two benches. There are two sides of the playground that have benches (one is shown in Figure 33 below).



Figure 33: Bench at Children's Playground

Behind one of the benches, and adjacent to the play area, is a building with bathrooms and a café (also shown in Figure 33 above) with ramps leading to both. The ramp providing access to the bathrooms met most standards but not all. The cross slope, rise, and length of the ramp were all within the requirements to meet standards with measurements of 0 degrees, 25.5 ft., and 25” respectively, but the running slope, top rail height from the surface of the ramp, and the clear length of the landing area did not meet standards. The quantitative data we received for those parameters were 5 degrees, 33.5”, and 46.5” wide by 50” long, respectively.

4.3.3 Playground Recommendations

This section will present general short and long term recommendations for playgrounds.

Short Term Recommendations

We compiled the following list of short term recommendations that will be discussed in further detail in this section;

- Add signage
- Install benches
- Implement wheelchair-accessible picnic tables

We recommend that more informational signage should be included at the playgrounds. For example, if there are bathrooms next to one of the playgrounds and there are signs near them notifying the public of their presence, an individual would not miss out on this information.

We recommend the installation of benches and/or picnic tables similar to the bench found in Figure 34 below. Even though some of the other assessed playgrounds already have benches, some of them have the potential for more, or better quality benches. For example, the benches found at playgrounds frequently do not have arm rests. If the user has a disability of some sort and, for example, has difficult getting up and down, the arm rest would be helpful to provide more support in the process of standing up and sitting down.



Figure 34: Proposed Bench for Installation (Bench, n.d.)

We recommend the implementation of wheelchair accessible picnic tables; especially for Jetties and Children’s Playground, which both have food available at the cafés.

Long Term Recommendations

We developed the following long term recommendations;

- Resurface the unpaved parking lots
- Add designated accessible parking
- Install access routes from entrances to play components
- Completely resurface the play area

We recommend the resurfacing of the Tom Nevers and Sconset Playground parking lots with pavement or another accessible surface. This would increase the ease of getting in and out of vehicles, as well as getting to and from their vehicles in the parking lots (MAAB 24.4.4).

The parking lots of Sconset and Tom Nevers Playgrounds would further be improved if there were designated accessible parking spaces on the newly-paved surfaces. Designated accessible parking would increase the amount of space people with disabilities would have to enter and exit their vehicles.

We also recommend the implementation of access routes made of a rigid accessible material leading from the playground entrance to the play components as well as between the components themselves. If the material is bolted down permanently or is temporary, it should partially adhere to the sand beneath it without shifting. It is important to consider a material that does not allow sand collect to on top of it. If the collection of sand in the middle of the access route is inevitable, then it is important to note that routine maintenance is more of a factor.

We also recommend resurfacing the playgrounds with an accessible material. Resurfacing of the play area would reduce the need for maintenance. Similar to that of access routes, the primary material that would be a good option for the surface of the play area is synthetic rubber or a turf-like material such as Grass-Pave (illustrated in Figure 35 below) that meets the ASTM requirements and ADA standards for impact attenuation (Mass Audubon, 9). This can also be found in the guidelines developed by the company GameTime.

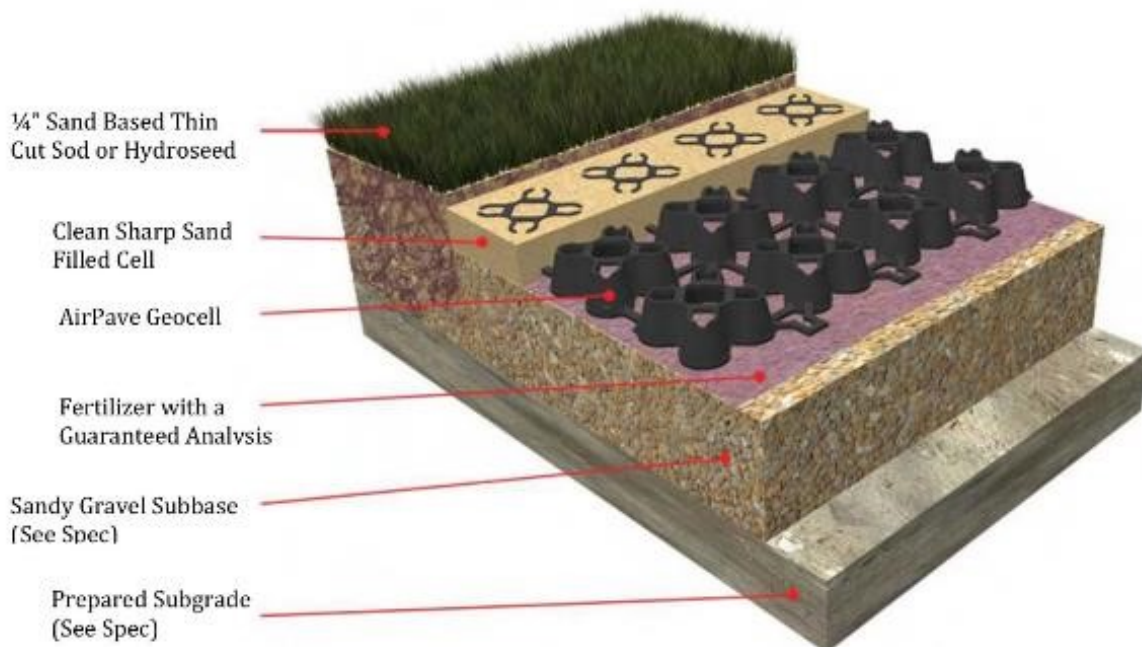


Figure 35: Grass-Pave Material (Airfield Systems, 2012)

We recommend adding better transfer systems, safer motor play, and more sensory features to playgrounds. Elements such as the short, angled climbing wall at Sconset Playground (Figure 28 above) or shallow stairs would achieve better transition between the ground and play equipment. In addition to structural improvements, the play components of the playground can be improved. For example, more swings with supporting backs and intended for bigger children, not just small children, would increase the accessibility of that play component. There is also potential for more sensory play components with the public playgrounds we assessed on the island. Features that stimulate the sense of smell, for example, would increase the degree of sensory elements present at the playgrounds. This can be fulfilled, for example, through the planting of different plants. The sense of hearing can be stimulated by installing similar features to the musical components at Winter Park (Figure 36). More advanced elements could include the outlines of species native to the island with buttons next to them that, once pressed, project the sounds the animals regularly make.



Figure 36: Musical Component at Winter Park

4.3.4 Detailed Recommendations for Children’s Playground

This section presents short and long term recommendations to improve access at Children’s Playground;

Short Term Recommendations

The following are short term recommendations for Children's Playground;

- Create an additional entrance
- Add benches within play area
- Implement signage

The implementation of another entrance would provide visitors with another way to get to play components and could result in a decrease of how far they would have to travel to get to the components. This entrance would be added next to one of the already existing benches and about 20 to 30 feet away to one of the current entrances located on the same side as the new one would be. The area in which this entrance would be installed is demonstrated in Figure 37 below.

We recommend the implementation of another bench adjacent to the entrance that is closest to the beachfront. It is important to implement a bench that has a backing and arm rests to provide support when sitting down and standing up.

Behind the bench closest to the building that houses the bathrooms and café, we recommend the installation of signage. These signs would inform people of the presence of restrooms and the availability of food. The signs should include Braille to accommodate those with sight impairments. The signs would be located on both sides of the building. Figure 37 shows all of our recommendations to improve Children's Playground.



Figure 37: Proposed Recommendations for Children's Playground

Long Term Recommendations

Our long term recommendations for Children’s Playground are as follows;

- Add access routes throughout play area
- Resurface the play area
- Install more accessible transfer systems
- Implement more sensory play

We recommend that access routes be installed from the playground entrances to the play components. Examples of materials these access routes could be composed of are synthetic rubber or a turf-like material like Grass-Pave. To further improve the surfacing of the play area, the sand could be totally replaced and the materials recommended for the access routes would cover the entire play area. The surfacing options must be in accordance to the ASTM and ADA standards set for impact attenuation.

We also recommend that more transfer systems and sensory play be implemented. For example, installing a ramp with a climbing wall on the opposite side of the current transfer system on the large play structure would increase access for a child with ambulatory concerns. If handles are included at an appropriate level, a child in a wheelchair would be able to grab them and use their upper arm strength to pull themselves up onto the platform. Figure 38 shows an example of this climbing wall at the Can-Do Playground in Wilmington, Delaware. For more information about the Wilmington Can-Do Playground, see the case study in Appendix A.3.1.



Figure 38: Can-Do Playground Climbing Structure (TripAdvisor, n.d.)

Children’s Playground would be improved by adding additional swings that have supportive back rests. These swings would allow children would do not have back strength to stay upright and still experience the swings. Figure 39 demonstrates the support of the swings at Can-Do Playground.



Figure 39: Accessible Swings with Supportive Backs (National Center on Health, Physical Activity and Disability, 2007)

We recommend that more sensory play be incorporated into the existing play structures. There is room underneath the play structures to include sensory play. Telephonic equipment could be included by installing talk tubes like those at Tom Nevers Playground. The playground equipment supplier, GameTime, sells what is known as a “Talking Stump”, resembling a tree, therefore avoiding looking too industrial. Plastic drums or bongos could also be implemented to stimulate children’s sense of hearing (GameTime, n.d.). To stimulate the sense of smell, indigenous plants to the island could be planted around the play area.

4.4 “Other Locations”

Visited locations that cannot be classified as a conservation area, beach, or playground are discussed in this section. These include cranberry bogs, crabbing locations, fields, fountains, and public piers. General findings are described, as well as short and long term recommendations

that were common at many locations. Detailed findings, and in-depth short and long term recommendations for the 1st Crabbing Location and a possible bench location on Madaket Road are discussed in this section.

4.4.1 General Findings

The following are general findings at “other locations”;

- Dirt or grass parking lots
- Absence of accessible parking spaces
- Uneven pathways
- Cliffs adjacent to property

In 6 of the 8 assessed “other locations”, we found the parking lots were either dirt or grass. It was also noted that 7 out of the 8 locations have the potential for the establishment of accessible parking spaces.

Another common finding was if there was a trail or path, it was often very uneven and consisted of dirt or grass. The ruts and dips in the path make travelling over it very difficult for people with mobility disabilities. We found the two crabbing locations on Madaket Road are near the water’s edge and lack any barriers preventing visitors from falling in. Figure 40 below shows the water exposure along the side of one of the crabbing locations.



Figure 40: Crabbing Location Water Exposure

Half of the areas (4 out of 8) did not have any benches and, if they were present, many were not wheelchair accessible. Most locations have the potential to be popular viewing areas given the scenery surrounding them. Figure 41 below, shows the vista at the potential bench location located on the Madaket Road Bike Path.



Figure 41: Possible Bench Location Vista

All of the “other locations” visited did not have features designed for those with sensory or cognitive disabilities, however, the locations do have the potential to create a more sensory experience.

4.4.2 Detailed Findings for Possible Bench Location

The following are findings for a possible bench location on the Madaket Road Bike Path;

- There is a scenic view of the sanctuary
- Paved bike path leading to area
- Flat surface at possible location

Located off the Madaket Road bike path is an excellent spot to install an accessible bench (Figure 42) to allow those with disabilities to take in a beautiful view. This location is about 800 feet down the bike path from the Sanford Farm parking lot, and since the bike path is paved, those with mobility disabilities would easily be able to visit the bench. The area also has a flat surface so installing a bench would not require flattening of the land.



Figure 42: Possible Bench Location

4.4.3 Detailed Findings for 1st Crabbing Location

The following are findings from the 1st Crabbing Location on Madaket Road;

- Area of parking lot has room for 5 to 6 cars
- There is a bench overlooking pond
- Path is not in good condition
- Dock has fallen into disrepair

At the 1st Crabbing Location there is space for approximately 5 to 6 cars to park. About 50 feet from the parking lot there is a bench that overlooks the pond that could be used by someone with cane, but not by someone who uses a wheelchair. The path to the dock has become eroded as shown in Figure 43 below. The dock is not wheelchair accessible due to the absence of curbs or handrails to prevent falling into the pond.



Figure 43: Eroded Path to Dock at 1st Crabbing Location

4.4.4 “Other Location” Recommendations

This section will present general short and long term recommendations for “other locations”.

Short Term Recommendations

The following are general short term recommendations for “other locations”;

- Install benches
- Designate accessible parking spaces
- Implement informational signs with Braille

It is recommended that benches be installed. The presence of benches would give those who have ambulatory concerns the opportunity to sit and rest. These benches should follow the standards set by the ABA and include supportive backs and armrests. It is important to note that these benches must be maintained.

We also recommend the designation of accessible parking at each location with proper signage and surfaces. These designated parking spaces would also need to be maintained to allow for continued use by those with disabilities.

Informational signs could be added at each location and include Braille text. This would allow those with sight impairments to be able to learn more about the property and its history.

Long Term Recommendations

The following are general long term recommendations for “other locations”;

- Resurface parking areas
- Resurface pathways or trails

We recommend resurfacing parking areas that aren’t already paved or surfaced with an accessible material. This would allow people with disabilities to get out of their car and enjoy the area. Maintenance would be required to make sure the parking area did not fall into disrepair and begin to develop cracks or potholes.

We also recommend resurfacing the paths or trails, as well as install access routes to all the benches on the properties. This would allow those with ambulatory concerns to explore the location. These improvements and installed access routes would need to be made of an accessible material and be maintained.

4.4.5 Detailed Recommendations for Possible Bench Location

This section presents recommendations for the Possible Bench Location on the Madaket Road Bike Path.

Short Term Recommendations

The following are recommendations for the Possible Bench Location;

- Install wheelchair accessible bench at viewing area
- Install additional wheelchair accessible benches along bike path

We recommend installing a bench at the location shown above in Figure 42. The paved bike path and bench would provide a short fully accessible walk with a resting spot at the end with a view for people to enjoy. There should be enough clear area of accessible material (like pavement) next to the bench so someone in a wheelchair and sit next to it as well. The bench should also include a supportive back and armrests for those who would have difficulty standing up.

Furthermore, benches could be added along the 800 feet of the bike path, so those that have difficulty walking for long distances would be able to stop and rest for a few minutes before continuing on to the main wheelchair accessible bench. All of these benches would need to be properly maintained to allow for continued use by those with disabilities.

Long Term Recommendations

The following are long term recommendations for the Possible Bench Location;

- Construct designated accessible parking space
- Install proper signage

We recommend constructing a designated accessible parking space with direct access to the bike path near the Sanford Farm parking lot. Figure 44 shows where the parking space could be added to allow direct access to the bike path. The parking space should be located directly off the main road, so it would not be too difficult to access from either direction. The parking space would need to be surfaced with an accessible material and include proper signage. The parking space would also need to be maintained to make sure that it is not falling into disrepair.



Figure 44: Possible Handicapped Parking Space Location

4.4.6 Detailed Recommendations for 1st Crabbing Location

In this section, recommendations for improvement of the 1st Crabbing Location are presented.

Short Term Recommendations

The following are short term recommendations for the 1st Crabbing Location;

- Designate an accessible parking spot
- Install accessible benches

We recommend designating an accessible parking spot with an accessible surface and signage. Our proposed design is shown in Figure 45. These improvements would need to be maintained so that the space doesn't fall into disrepair.



Figure 45: Proposed Parking Lot for 1st Crabbing Location

There are two benches already at the property; one with back support and one without. We recommend adding a third bench that is wheelchair accessible, or replacing one of two current benches with a wheelchair accessible bench that has both back support and armrests. This would also include adding a level clear area made of an accessible material next to the bench to allow a wheelchair to sit next to the bench.

We also recommend adding a bench on the other side of the road facing the other half of the pond. This location would give visitors a different view of the pond. To facilitate safe travel to the bench we recommend adding a crosswalk from the parking area to the other side of the

road. All of the installed benches would need to be maintained to allow for continued use by those with disabilities.

Long Term Recommendations

The following are long term recommendations for the 1st Crabbing Spot;

- Pave or resurface parking area with accessible material
- Repair ruts in pathway
- Repair or replace dock

We recommend completely paving or resurfacing the parking area with an accessible material. This resurfacing would make the parking lot smooth and even for multiple years.

We also recommend repairing the deep ruts in the pathway leading to the dock. Resurfacing the path with an accessible surface like stone dust would be ideal.

We also recommend repairing or replacing the dock. The broken planks and 6 inch rise up to the dock platform are shown in Figure 46. Ideally, completely replacing the dock with one that is wider and with handrails and curbs would improve its accessibility by the highest degree.



Figure 46: Dock at 1st Crabbing Location

Maintenance is a common theme when making locations more accessible. Along with other variables, prior to the implementation of any of our recommendations, the cleaning and repairing that will need to be performed on a regular basis should be considered.

5. Conclusion

The Nantucket Commission on Disability (NCOD) is committed to fully integrating those with disabilities into the Nantucket community. This includes improving accessibility to the outdoor areas on the island. To help them achieve this goal our team worked with NCOD to assess trails in conservation areas, beaches, and playgrounds to determine their accessibility for a range of disabilities and communicate the accessible locations to the public.

Through our research, assessments, observations, and critiques, we found that although few areas were fully accessible, all the visited locations had the potential for improvement. For example, a common finding was that many parking lots did not have a designated handicapped accessible parking space and the parking lot surfaces were generally composed of material that was not compatible with a wheelchair.

One future project than could be completed using our project as a reference is to continue assessing the accessibility of Nantucket's outdoor locations for a variety of disabilities. Another potential project could be to work with a specific conservation organization and/or the town to improve the accessibility of a selected location.

Although our project applied specifically to the outdoor areas on Nantucket, our assessment process can be applied to any project that plans to determine the accessibility of an outdoor location. This is important because everyone of all abilities should be able to access and enjoy the outdoors. Our seven weeks here have helped increase awareness on Nantucket of this issue and will assist NCOD in integrating those with disabilities into the Nantucket community.

Throughout this project our team learned about the different types of disabilities and realized that although a location may have a gorgeous view and we are able to enjoy it, someone with a disability might not be able to. This has given us a new perspective on the world and motivated us to look for how an outdoor location can be improved so that those with disabilities can experience it as well.

Appendix A: Case Studies

In this appendix, important case studies of conservation areas, beaches, and playgrounds are discussed. Included in this chapter are various lessons learned from these case studies.

A.1 Conservation Areas

A.1.1 Shady Valley, Tennessee

In this case study, the local A.T. club of Shady Valley, Tennessee, the Tennessee Eastman Hiking Club (TEHC), designed an accessible trail to replace a section of the Appalachian Trail (A.T.) located on a deteriorating farm road in Shady Valley, in 2001. When TEHC decided to create an accessible trail, they were worried that the trail designs would not meet all accessibility standards. To TEHC's surprise, their project met several exceptions to the proposed Forest Service Trail Accessibility Guidelines (FSTAG), and they were able to move forward with the project without building to all accessibility standards (Demrow, 27). Please note, the case study did not report what these exceptions were. This shows that even if a proposed design is unable to meet full accessibility standards, it can still be made accessible to a wide range of disabilities.

The accessible trail starts at a newly created accessible entrance and moves through rolling hay fields along a hilltop to a panoramic view of Shady Valley. Beyond the overlook, the A.T. continues north but it is no longer accessible. The valley before construction is shown in Figure 47.



Figure 47: Landscape of Shady Valley (Appalachian Trail Re-Design, 28)

To start, the Forest Service volunteered to “construct a new parking lot on the east side of Tennessee Route 91 with an accessible space on the west side of the road where the accessible trail starts” (Demrow, 27). Since the parking lot is located on a sunken farm road, the difference in elevation is 100ft, which is over the limit of a 1:20 ratio (5%) of elevation that would allow a wheelchair to travel over the area, as stated in the proposed FSTAG (Forest Service Trail Accessibility Guidelines, 2013). To solve this problem, TEHC proposed installing a sidehill ramp with “cribbing”. Cribbing is when “rocks and other materials are placed along the edges of a trail to prevent erosion and ensure the trail stays smooth and traversable for wheelchairs” (Demrow, 56). TEHC was able to design a ramp that would not exceed an elevation of 2.6%, so this falls under the “go forever” accessible grade of 5%, so it was able to be approved (Demrow, 28).

Next, to make sure there was a solid surface to walk on and that the trail entrance and width met the accessibility standard of 36”, the contractor “excavated the location for a tread to a depth of 6 inches, then laid down geotextile fabric filled with ABC aggregate (a.k.a. “road bond”), a combination of different sizes of sharp gravel and stone dust” (Demrow, 28). The contractor mechanically tamped the ABC aggregate to make sure it would provide a durable, firm, and stable trail tread. The contractor also designed the tread to be flush with the height of the hay field so that “the trail would not be an impediment to mowing the hayfield, and so water would be able to flow across the trail, rather than be caught on the uphill side of a trail”

(Demrow, 28). TEHC requested that the contractor also install a series of grade dips every 200' to “disperse any water that accumulates on the trail and also to serve as a rest spot for wheelchair users” (Demrow, 28). However, over time a big concern became the growth of grass and weeds on the edge of the trail that eventually worked their way into the tread itself. TEHC is currently working on a permanent solution to the problem, with a temporary one being to replace the old treads with new ones. Figure 48 shows a GIS model of the old route of the A.T. and the relocated section that has been made accessible.

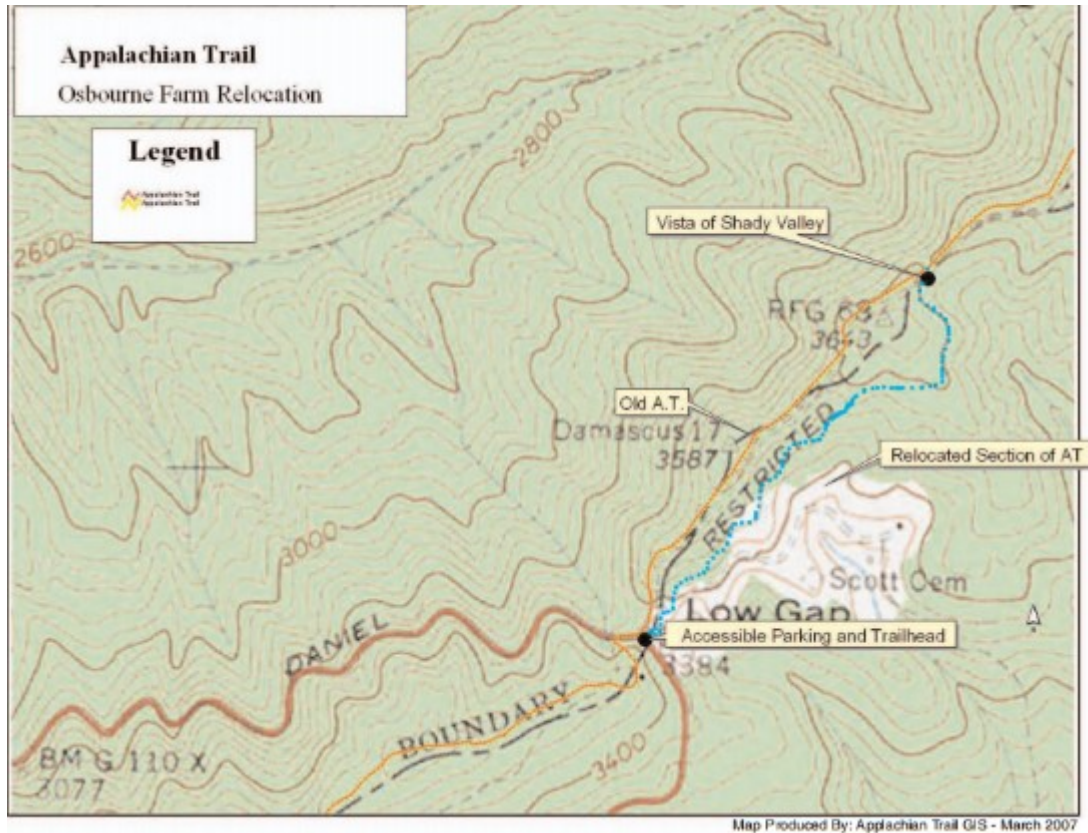


Figure 48: Shady Valley Trail Design (*Appalachian Trail Re-Design*, 30)

Lessons Learned

This case study highlighted certain key issues that can arise when designing an accessible trail. These include receiving approval from the appropriate governing agencies and determining if the proposed designs meet current accessibility standards, or if exceptions can be applied. Specifically, the standards for elevation changes are important factors to consider when creating an accessible trail. Also, trail levelness and the disturbance of the trail surface from flora growth are issues that should be addressed.

A.1.2 Pearisburg, Virginia

In Pearisburg, Giles County, Virginia an accessible trail was proposed to replace an existing blue blazed side trail that connects to a currently inaccessible portion of the A.T. in Bluff City along the New River. The A.T. crosses this blue blazed trail 100 yards west of the George Pearis Cemetery, so the local A.T. club, the Roanoke A.T. Club (RATC), proposed extending this accessible side trail to connect to the cemetery. Since the average fall line grade on the south side of the trail below the cemetery is 40%, the beginning of the current trail has grades of 20% or more, and the trail enters the cemetery below the desired location, it would be very difficult to repair the trail. A better solution would be to completely remodel the trail to meet trail accessibility specifications (Demrow, 32). If a new trail is constructed it would have an average elevation of 5.25% which is within FSTAG's standards, however, the location of the trail will be determined by archeological review. Please note, when the report was written RATC was still waiting for archeological review.

The cemetery is located 111ft above a parking area and overlooks the New River. The cemetery is a very popular historical site, because Captain George Pearis, a revolutionary war veteran and founder of Pearisburg, is buried there along with many soldiers who fought in both the Revolutionary and Civil Wars (Demrow, 31). Please note, no date was listed for when the project was designed, constructed, or completed.

RATC designed two different methods for creating an accessible trail to the cemetery. The first option would "combine the current A.T. and the blue blazed trail from the new proposed trailhead location and would climb at about a 3% grade with one "S" curve. Approximately 200 feet north of this point, the A.T. would turn and head to the New River trail and the blue blazed would continue into the cemetery" (Demrow, 32). The trail would mainly follow the current A.T. and the proposed additions are shown by the blue dotted line on Figure 49. The second alternative would leave the two trails separated and "would require rehabilitation and minor realignment of the blue blazed trail, and relocation of the A.T. to the point where the two trails currently intersect" (Demrow, 32). This is shown by the solid blue and brown lines on Figure 49.

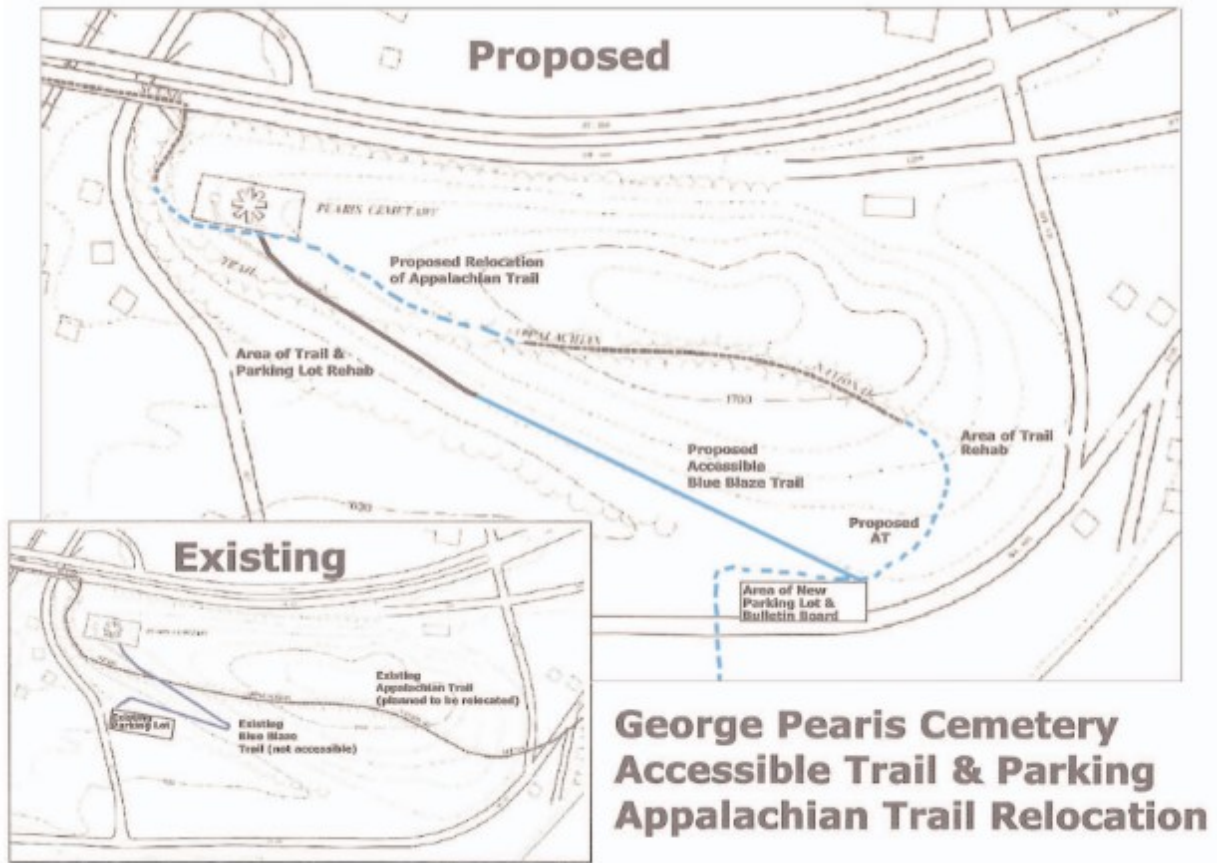


Figure 49: Pearisburg Trail Design (*Appalachian Trail Re-Design, 34*)

The first option would be more expensive, but would create a trail that has a lower elevation and more scenic views than the second option. Both alternatives would meet accessible design parameters, but the final route will be determined by archeological review of the area to determine which path has the most stable land. No new information has been found that states which design was chosen (Demrow, 33). Figure 50 shows a portion of the current blue blazed side trail to Pearis Cemetery.



Figure 50: Side Trail to Pearis Cemetery (Appalachian Trail Re-Design, 33)

Lessons Learned

Terrain was a large issue in this case study. Most of the trail was too steep and/or uneven to consider repairing, so a complete remodel was suggested. This design concept can become very expensive since an entire new trail would need to be created. The RATC outlined one option for creating an accessible trail that would be cost effective and one that would not, however they were unable to choose the more cost effective design, because an archeological review of the areas had not been completed. An archeological review would determine which option has more firm and stable ground that would be easier to build on and would meet accessibility standards. For this reason, a more expensive design option may need to be chosen when creating an accessible trail, because the terrain would be better suited for the required materials and features.

A.1.3 Falls Village, Connecticut

In 1999, the local A.T. club of Falls Village, Connecticut, AMC Connecticut Chapter (A.T. Committee), in partnership with Northeast Utilities, designed a 1.25-mile accessible trail, utilizing a portion of the existing A.T. in Connecticut. At the time, the Access Board's Regulatory Negotiation (Reg/Neg) Committee was in the process of developing their standards for accessible trails. Ultimately, the A.T. Committee chose to use the Access Board's drafted guidelines as their design standards.

The club voted to build an accessible trail in Falls Village in order to "create opportunities for accessible and less rugged recreation on the A.T." (Demrow, 41). The A.T. Committee chose Falls Village, because in Connecticut "there are very few locations aside from the Falls Village site with suitable terrain" (Demrow, 41). The trail is next to the Housatonic River and offers extremely gentle grades. The blue lines in Figure 51 illustrate where the accessible trail was built. Northeast Utilities had an "existing interpretive nature trail on the site", and noted that "there is easy access to the trail on paved roads for vehicles importing surfacing material" (Demrow, 41). The report noted that no demographic research was used for decision making.



Figure 51: Falls Village Trail Design (*Appalachian Trail Re-Design*, 45)

The National Parks Service (NPS) did an environmental assessment of the site to “ensure that construction would not harm the historic race track or other historic and cultural features at the site” (Demrow, 42). To create the accessible trail, the contractor “laid down geotextile and then spread three quarter-inch gravel 3 inches thick and 3 feet wide for the treadway” (Demrow, 43). He also “imported rip-rap sized stone to build a causeway or turnpike, placed a culvert at the low point, and built the trail on and over a rock” (Demrow, 43). In addition to the trail being made accessible, one bridge was constructed to accessibility standards just as the trail goes into the woods (Demrow, 43).

The volunteers who helped with the project noted that they are very happy with the surfacing material, but have been having problems with drainage on the first 500’ of trail (Demrow, 42). Recently, they added some “dirty pond sand” to stabilize the tread, but most of it

has washed away, and it does not meet the “firm and stable” criteria. The A.T. Committee is considering removing the sand, then “surfacing the ground with some combination of fabric, stone dust, half inch or less gravel, and a culvert or two” to solve these problems (Demrow, 44). One addition the report mentioned was that a volunteer had make benches to be placed along the trail. However, the benches do not meet accessibility standards, which require a backrest. Also, several of the benches face the river, so there is not sufficient room for a wheelchair to navigate between the bench and where the bank falls away (Demrow, 44). Figure 52 illustrates part of the trail that had to be built up with imported rock to meet accessible grade guidelines.



Figure 52: Section of the Falls Village Trail (Appalachian Trail Re-Design, 43)

Lessons Learned

In this case study, the A.T. Committee dealt with some of the same issues that TEHC did in the Shady Valley project. The A.T. Committee had to determine which standards and guidelines to follow for trail accessibility, when none have been created yet, as well as contend with issues of drainage and trail disturbance. The case study also addressed the importance of receiving the proper approval before construction, so that no implemented features will harm the historical atmosphere and/or natural habitat of the area.

A.1.4 Bear Mountain, New York

In 2001, the local A.T. club of Bear Mountain, New York, New York/New Jersey Trail Conference (NY-NJTC), decided to start planning an improved trail from the “lawn area to the summit of the mountain to provide visitors with a short route to an overlook with views to the north” (Demrow, 35). The main area of the trail was investigated for accessibility, but had serious grade and terrain issues, and also would have required a change in hiking experience if the trail was made fully accessible. Therefore, the section was not reconstructed as an accessible trail, but with considerable universal design enhancements (Demrow, 35). Figure 53 shows the beginning of the trail before construction.



Figure 53: The A.T. as it Leaves the Lawn Area for the Summit of Bear Mountain (Appalachian Trail Re-Design, 36)

“Since steep grades, ledges, and a significant talus slope would result in trail grades and obstacles that will not meet accessible guidelines, despite the best efforts of designers” the NY-NJTC worked to make sure “the cross slope, surfacing, protruding objects, and other elements” would meet accessible standards (Demrow, 36). Consecutive steps were kept to a minimum, but the bottom portion of the trail has “over 700 steps that were designed to not exceed 8 feet of rise. The width of these steps will vary from 3-5 feet, depending on terrain, but a few sections will have steps with widths of less than three feet” (Demrow, 36). The NY-NJTC noted that although

it was not possible to build the trail strictly to accessibility standards, the application of universal design resulted in enhanced access for many visitors on virtually all sections of trail (Demrow, 36). Figures 54 and 55 show the existing and proposed trails for Bear Mountain.

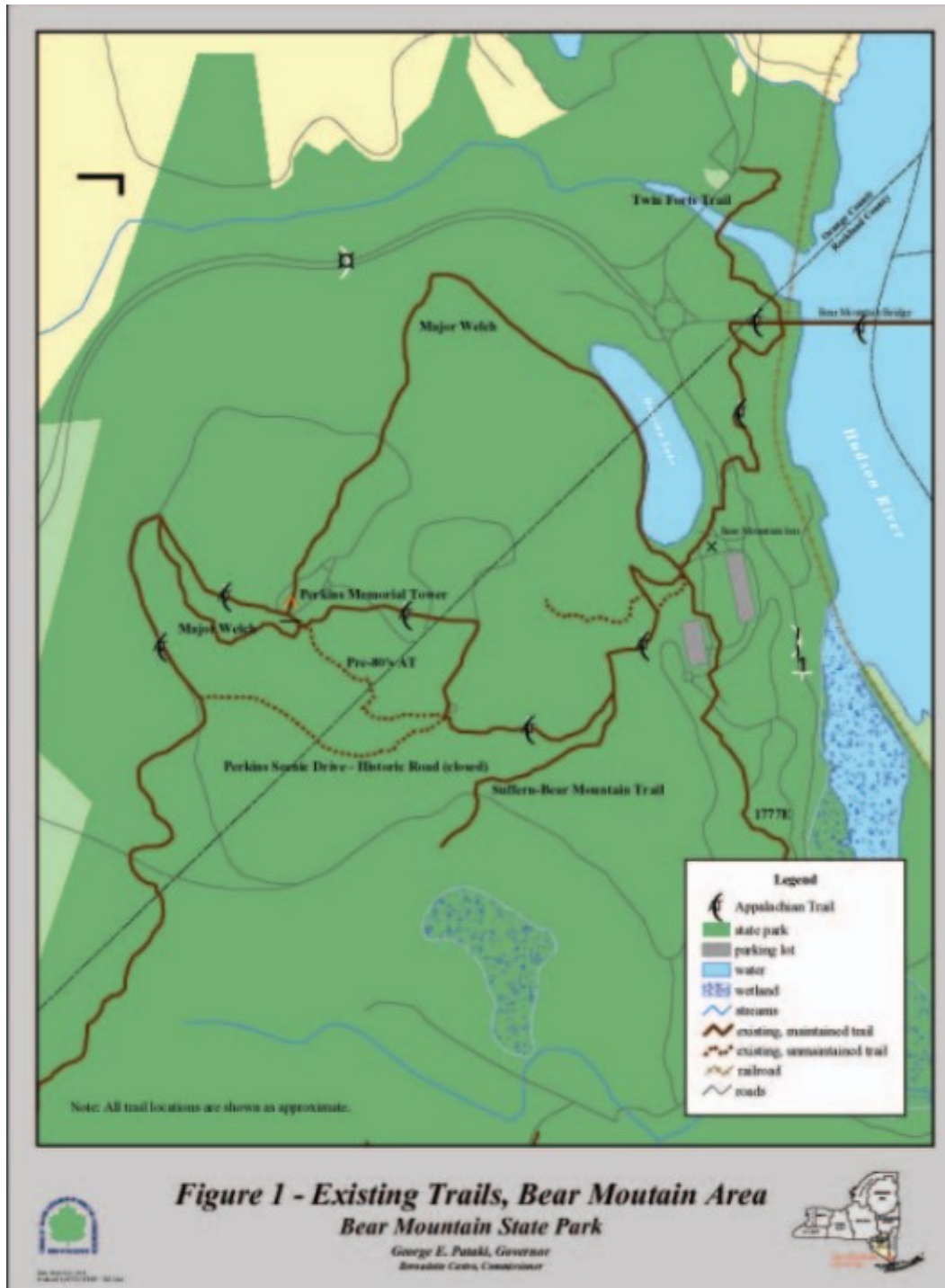


Figure 54: Existing Trails for Bear Mountain (Appalachian Trail Re-Design, 39)

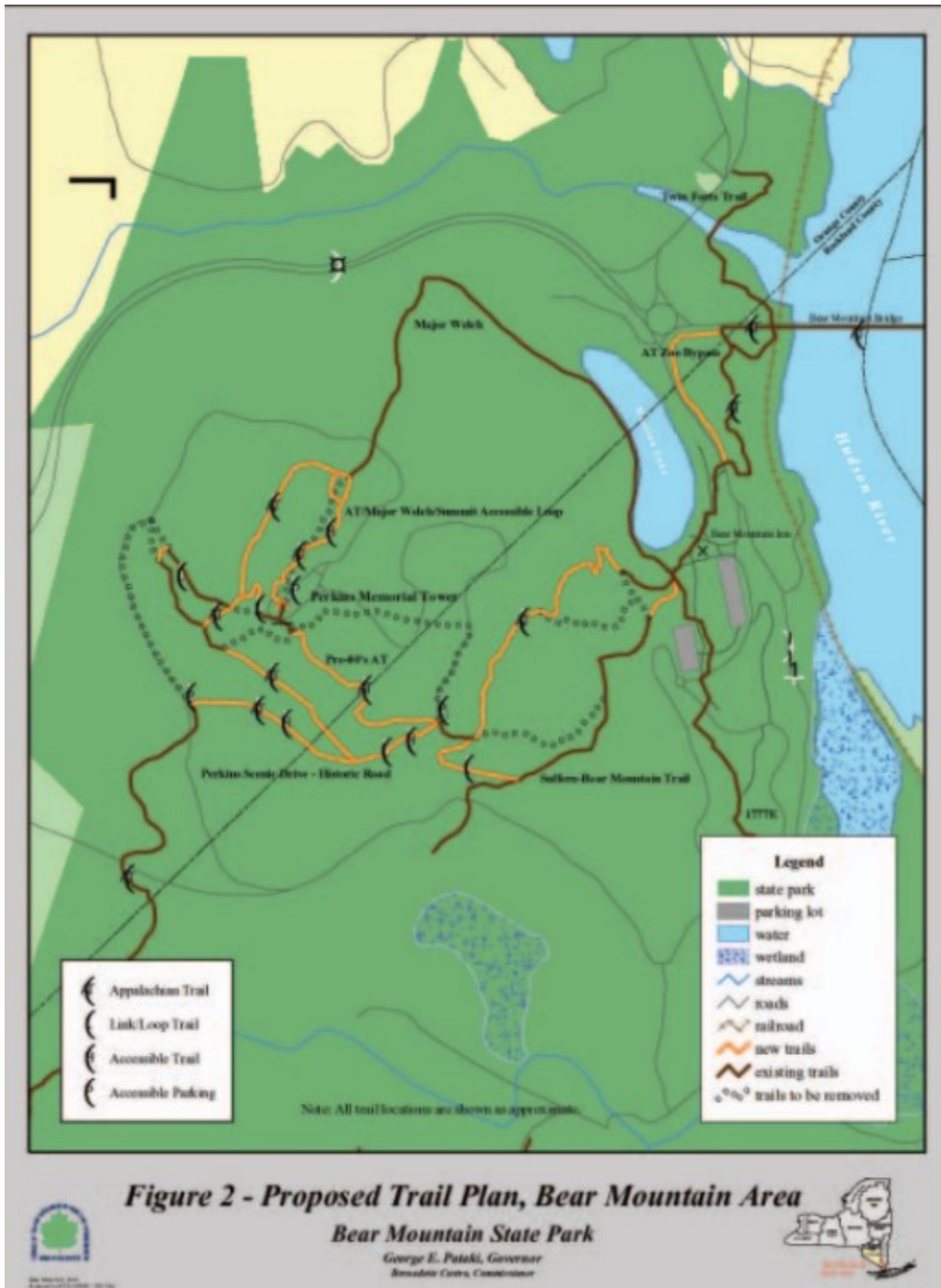


Figure 55: Proposed Trails for Bear Mountain (Appalachian Trail Re-Design, 40)

Lessons Learned

This case study showed that terrain is a major issue when trying to improve the accessibility of a trail. Unfortunately, some non-accessible elements cannot be avoided, however, that does not mean universal design principles cannot be applied to a location. Even one small change can drastically increase the number of people with a disability who can access a property.

A.1.5 Mass Audubon's All Persons Trails

Mass Audubon has designed, developed, and now runs 12 “All Persons Trails” across Massachusetts (Mass Audubon 1). These trails are designed to adhere to all anticipated ADA standards and are then outfitted with multiple interpretive features including audio tours, boardwalks, guide ropes, handrails, and educational stops (Mass Audubon 2). The creation of these accessible trails is part of the Mass Audubon Accessible Trail Project. Funded by the Institute of Museum and Library Services (IMLS), Mass Audubon began working on designing accessible trails in 2008.

Broad Meadow Brook, located in Worcester, Massachusetts, features an All Persons Trail that is 1 mile long round-trip. Interpretive features available on this trail include a post-and-rope guidance system (with notification beads), stone dust trails and wooden boardwalks, intermittent seating, an informational and directional audio tour, Braille educational stops, and tactile maps. The sensory trail takes the user to wetlands, small ponds, and even as far as Broad Meadow Brook itself.

We have visited this trail ourselves and now use it as a model of what an ideal trail would look like. In fact, Mass Audubon has developed a guidelines manual detailing what they've learned while designing 12 All Persons Trails. The manual is available for download free to the public and covers materials used to permitting. In our interview with Mary Griffin, Lucy Gertz, and Ernie Steinauer we were told one of the biggest insights from this manual is the involvement of expert users, testers, and resource professionals in the designing process. These kinds of insights would be invaluable to a group or individual planning on creating an accessible trail.

Lessons Learned

From this case study, it was learned that some conservation organizations have already taken steps to improve the accessibility of their locations. Mass Audubon can be used as an example to show other conservation owners how they can incorporate elements that allow those with disabilities to experience their properties without damaging the conservation land. Mass Audubon has also developed a manual detailing the appropriate steps to take when improving the accessibility of a conservation area. This manual served as an excellent resource.

A.2 Beaches

During our research, no case studies were found that focused on improving beach access for those with disabilities. Despite this, there are multiple beaches who have implemented temporary equipment to make it easier for the disabled population to visit them.

Lessons Learned

Since we could not find any case studies on improving beach accessibility, we had to determine what the best recommendations and major challenges would be. These included erosion and implementing boardwalks.

A.3 Playgrounds

A.3.1 Can-Do

In July of 2007, the combined efforts of public and private sectors of Wilmington, Delaware were able to bring the concept of a “boundless playground” to reality. From the efforts of the Division of Parks and Recreation, Department of Delaware Transportation (DelDOT), and Delaware’s Department of Natural Resources and Environmental Control in partnership with 6 local rotaries, the Can-Do playground project was completed (National Center on Health, Physical Activity and Disability, 2007).

The architects of the Can-Do playground made sure to include all disabilities when designing this playground. For example, there is a textured wall with the designs of the inside and outside of a train, as well as a steering wheel to give children—with and without sight impairments—the imaginative experience of driving the train. Figures 56 and 57 show play surfaces that are vital components to the Can-Do playground. The playground includes mulch and a rubber-synthetic surface for good attenuation—one of the factors that must be considered according to the guidelines set forth by the ADA.



Figure 56 (left): Steering Wheel and Textured Wall for Sensory Play (Can-Do, 2007)

Figure 57 (right): Sand Area for Sensory Play (Can-Do, 2007)

Lessons Learned

From this case study, the idea of “boundless” playgrounds is introduced, which are a great example of all-inclusive play. They allow children of all disabilities to come and enjoy the playground, making sure there is a special component for those with less common disabilities.

A.3.2 Sconset, Nantucket, MA

The Sconset Playground on Nantucket, is a fully ADA compliant playground that is located within Codfish Park. The idea of an improved Sconset Playground became a subject of interest back in 2011 (Community Foundation for Nantucket, n.d.). The “playground” at that time consisted of a once-whole bench whose other halves were scattered around the lot, and a sole swing (Richards, n.d.). The idea of the new and improved playground came from a group of residents in Siconset who wanted to have an area where there could be healthy play and interaction for not only children, but the families too. The group devised a preliminary plan to propose to the Nantucket Islands Land Bank Commission, the owner of the lot where the existing playground was. The design not only included fundamental equipment like swings, handle bars, a rope-climbing area, and benches, but also had unique features like a nautical ship and simulations of Nantucket’s landmarks like the Sankaty Lighthouse (Community Foundation for Nantucket, 2013; Richards, n.d.; Linscott, n.d.).

By the summer of 2013, after the plan was complete, the Land Bank fully approved the design (Community Foundation for Nantucket, 2013). The drawings of the plans are shown in Figure 58.



Figure 58: Drawings of the Plans for Sconset Playground (Julie Jordin, 2013)

However, in 2014, opposition of the project arose despite the approval. William Silverman, a resident who lives near the playground, and the Massachusetts Department of Environmental Protection and Nantucket Superior Court, believed the development of Sconset playground in respect to the lot would be “incompatible with its natural state” (Richards, n.d.). The appeal further argues that the project is “inconsistent with the R-1 zoning of the area as it is a ‘recreational activity’...” (Richards, n.d.). Despite the controversy, the plans eventually were put into effect.

Lessons Learned

This case study demonstrates that a fully ADA compliant playground can be implemented on Nantucket. However, when trying to implement this playground, opposition was faced. Opposition will be faced when any new idea is proposed to a community, so it is important to remember that these ideas are benefiting the entire community by increasing the number of children that are able to enjoy a playground. This should not deter anyone who wishes to take on a similar project, but should encourage them to make sure they are improving the location to the best of their ability so that the maximum number of people with disabilities are able to experience the area.

Appendix B: Nantucket Maps

In this appendix, a map of all the visited and assessed locations is shown by following the link below.

https://drive.google.com/open?id=1OMsUqE1QzWC331wJDSLl_sM84Zg

Appendix C: Templates

In this appendix, templates for data collection and presentation are given. The completed Assessed Locations Database can be found by contacting our advisors and/or sponsors. The Reference Guide of Assessed Locations can be found in a separate document.

The template for trail assessment is shown in Figure 59.

QUANTITATIVE DATA TO COLLECT			QUALITATIVE DATA TO COLLECT	
parking lot		TOOLS USED	parking lot	
area		rolatape	surface	
# parking spaces		N/A	presence of hcap spaces	
# hcap spaces		N/A	trail itself	
distance from hcap spaces to entrance		rolatape	presence of benches/boardwalks along trail	
trail entrance			surface of trail	
width		measuring tape	any ridges or bumps	
distance from hcap spaces		rolatape	levelness	
trail itself			any major cross slope	
width		measuring tape	signage	
rut depth		measuring tape	presence	
distance to benches, tables, etc.		rolatape	content	
slopes			location	
common running slopes		inclinometer	braille	
common cross slopes		inclinometer	hazards	
			deer ticks	
			ticks	
			poison ivy	
			algae in water	
			deer/ hunting	
			other notes	

Figure 59: Template for Trail Assessment

The template for beach assessment is shown in Figure 60.

QUANTITATIVE DATA TO COLLECT			QUALITATIVE DATA TO COLLECT
ramps		TOOLS USED	ramps
entrance width		measuring tape	presence of ramps
running slope		inclinometer	surface of ramp
cross slope		inclinometer	presence of lip to ramp
length of ramp		measuring tape	parking lot
railing height		measuring tape	surface of parking lot
clear space between rails		measuring tape	presence of hcap spaces
clear width		measuring tape	hcap bathrooms
landing area (turning radius)		measuring tape	presence of them
parking lot			ramp to them
area		rolatape	is it a stall or separate bathroom
number of feasible parking spaces		N/A	nature of the surf
number of handicap spaces		N/A	is it heavy or calm
distance from hcap space to beach entrance		rolatape	levelness of beach
beach entrance			flat or large cross slope
width		measuring tape	beach entrance
running slope		inclinometer	width
cross slope		inclinometer	surface
bathrooms			level
distance from hcap parking space		rolatape	sand
distance from beach entrance		rolatape	compact or very loose
			signage
			presence of
			content of signage
			location of signage
			presence of braille
			pathway
			benches
			surface
			boardwalk to beach?
			sensory elements
			presence
			what is there
			other notes

Figure 60: Template for Beach Assessment

The template for playground assessment is shown in Figure 61.

	parking lot			play components
area	rolatape			presence of motor play
number of feasible parking spaces	N/A			presence of sensory play
number of handicap spaces	N/A			overall safety/stability of components?
distance from hcap space to playground entrance	rolatape			surface(s)
	playground entrance			bathrooms
number of entrances	N/A			presence of bathrooms
width	measuring tape			presence of hcap bathroom(s)
running slope	inclinometer			hcap stall or hcap bathroom
cross slope	inclinometer			whole playground
	bathrooms			surfaces
distance from hcap parking space	rolatape			rough ideas on feasibility (yes/no)
distance from playground entrance	rolatape			overall levelness of the playground
	play components			other notes
distance from entrance	rolatape			
number of transfer systems	N/A			
area of steps in transfer systems	measuring tape			
height of steps in transfer systems	measuring tape			
number of steps in transfer systems	N/A			
distance between play components	rolatape			
egress opening widths within play components	measuring tape			
access opening widths to play components	measuring tape			
number of elevated play components	N/A			
number of ground play components	N/A			
height of components from ground level	measuring tape			
distance from main pathway	rolatape			
	access routes			
width of pathway	measuring tape			
length of pathways	rolatape			
height of lip on sides of route if path surface differs from main surface	measuring tape			
running slope	inclinometer			
cross slope	inclinometer			
total area of all the access routes	rolatape and measuring tape			
	whole playground			
area of playground	rolatape			

Figure 61: Template for Playground Assessment

The template for data presentation in the reference guide is shown in Figure 62.

Site Name	
Owner	
Type of Location	
Region	North, South, East, West, Center
Sub-Region	
Current Accessible Elements	<input type="checkbox"/> Handicapped Parking <input type="checkbox"/> Handicapped Bathrooms <input type="checkbox"/> Ramps <input type="checkbox"/> Boardwalks <input type="checkbox"/> Benches <input type="checkbox"/> Signage <input type="checkbox"/> Sensory Elements
Current Inaccessible Elements	<input type="checkbox"/> Rolling terrain <input type="checkbox"/> Cross-sloping terrain <input type="checkbox"/> Loose sand <input type="checkbox"/> Wetlands <input type="checkbox"/> Roots, rocks, sticks, sand <input type="checkbox"/> Poison Ivy, Ticks <input type="checkbox"/> Hunting area in fall
Parts of Location Are Accessible to	
Short Term Recommendations	
Long Term Recommendations	



Figure 62: Template for Data Presentation

Appendix D: Guides

In this appendix, assessment criteria for trails, beaches, and playgrounds is given as well as possible survey questions.

D.1 Assessing Trails Criteria

- Grade
 - The average grade between two designated stations along the trail
- Cross Slope
 - slope is measured at designated stations along the trail with a 24-inch inclinometer
- Width
- Surface
 - The type of surface found in between stations is recorded, as well as a description of its characteristics
- Trail Length
 - Most of this should already be recorded. If not, we may or may not gather this information depending on time.
- Parking
 - Number of spaces
 - Number of handicap spaces
- Picnic Areas
 - Wheelchair accessibility
- Picnic Shelter
 - Wheelchair accessibility
- Garbage/Recycling
- Benches
- Information Kiosk
- Crutches/Braces accessibility
- Bike Racks
- Number of trails
- Longest Walk
- Shortest Walk
- Accessibility by car
- Accessibility by bus
- Accessibility by bike
- Accessibility by walking

- Trail Conditions
- Difficulty Walking Accessibility
- Ease of updating accessibility

D.2 Assessing Playgrounds Criteria

- Paths
 - Width
 - Grade
 - Surface
 - Curbing
 - Slope
 - Handrails
 - Elevated or ground level
- Play Surface
- Transfer Systems
 - Height
- Ramps on play structure
- Parking
 - Number of spaces
 - Number of handicap spaces
- Washrooms
 - Wheelchair accessibility
- Picnic Areas
 - Wheelchair accessibility
- Picnic Shelter
 - Wheelchair accessibility
- Garbage/Recycling
- Fountain/Faucet
- Benches
- Information Kiosk
- Crutches/Braces accessibility
- Bike Racks
- Accessibility by car
- Accessibility by bus
- Accessibility by bike
- Accessibility by walking
(GameTime)

D.3 Assessing Beaches Criteria

- Parking
 - Number of spaces
 - Number of handicap spaces
- Washrooms
 - Wheelchair accessibility
- Showers
 - Wheelchair accessibility
- Picnic Areas
 - Wheelchair accessibility
- Picnic Shelter
 - Wheelchair accessibility
- Telephone
- Garbage/Recycling
- Fountain/Faucet
- Dock
 - Wheelchair accessibility
- Fishing Pier
 - Wheelchair accessibility
- Boardwalk
 - Specific Measurements, details found below in Tables 1-4
- Restaurants
 - Wheelchair accessibility
- Benches
- Playground
 - Wheelchair accessibility
- Information Kiosk
- Crutches/Braces accessibility
- Bike Racks
- Accessibility by car
- Accessibility by bus
- Accessibility by bike
- Accessibility by walking

D.4 Additional Information for Assessing Outdoor Areas

Exception Conditions

These apply to viewing areas, trails, outdoor recreation access routes, and beach access routes

- “1. Compliance is not practicable due to terrain.
2. Compliance cannot be accomplished with the prevailing construction practices.
3. Compliance would fundamentally alter the function or purpose of the facility or the setting.
4. Compliance is limited or precluded by any of the following laws, or by decisions or opinions issued or agreements executed pursuant to any of the following laws:

Endangered Species Act (16 U.S.C. §§ 1531 et seq.);

National Environmental Policy Act (42 U.S.C. §§ 4321 et seq.);

National Historic Preservation Act (16 U.S.C. §§ 470 et seq.);

Wilderness Act (16 U.S.C. §§ 1131 et seq.); or

Other federal, state, or local law the purpose of which is to preserve threatened or endangered species; the environment; or archaeological, cultural, historical, or other significant natural features.” (The Universal Trail Assessment Process; United States Access Board, 2005)

Tables 1-4 and Figure 63 illustrate the standards and guidelines for accessibility in different outdoor spaces.

Table 1: ADA Requirements of Accessibility Features in Different Locations

Location / Feature of Location	
Aspect to Measure / Check for Presence	Specifications
Walking Surfaces (on Accessible Routes)	
Running Slope	No steeper than 1:20
Cross Slope	No steeper than 1:48
Firmness	Resists deformation by indentations
Ramps	
Running Slope	No steeper than 1:12 Some exceptions exist based on physical and site limitations
Cross Slope	No steeper than 1:48
Ramp Landings	Must be at each end of a ramp run and at any point ramp changes direction Must be at least as wide as ramp run Must have a clear length of at least 60 in Where ramp changes direction, landing must be at least 60 in by 60 in
Handrails	Required if ramp run has risen greater than 6 in
Play Areas (Playgrounds)	
Transfer systems	These are platforms and steps used to physically transfer the user to elevated play components, but ramps are also specified and seem more ideal.
Accessible Routes (connecting play components)	At ground level: Min. Clear width of 60 in. At elevated level: Min. Clear width of 36 in.

Ramps	At ground level: Max running slope of 1:16 At elevated level: Max rise of 12 in.
Entry Points and Seats	11 in. min. and 24 in. max from the clear floor or ground space (does not apply to slides)
Viewing Areas	
Clear Ground Space	Must be provided at each viewing location. 36 in. min by 48 in. min either forward or parallel approach to viewing location. One full side of the clear ground space must adjoin or overlap a nearby outdoor recreation access route or trail or another clear ground space
Viewing Space	At each viewing location; point of interest must be visible; must be 32 in. max and 51 in. min off the ground and be at least as wide as the clear ground space.
Turning Space	See Figure
Surface	Clear ground spaces and turning spaces must be firm and stable
Slope	Clear ground spaces and turning spaces max slope of 1:48 in any direction (if surface is anything other than asphalt, concrete, or boards then max slope is 1:20 when necessary for drainage)
Outdoor Recreation Access Routes (ORAR)	
Clear Width	36 in. min
Passing Space	If less than 60 in. wide must provide passing spaces at 200 ft. intervals minimum. (60 in by 60 in min)
Obstacles	Must be less than ½ in above ground (If surface is other than asphalt, concrete, or boards 1-inch max)
Openings	Shall not allow a ½ in diameter sphere to pass

Slope	No steeper than 1:10 (table 1016.7.1 for specifics if we need it)
Cross Slope	Max 1:48 (If surface is other than concrete, asphalt, or boards cross slope of 1:20 max is allowed if necessary for drainage)
Turning Spaces, and Protruding Objects	See Trails
Resting Intervals	60 in long min 36 in. wide min if adjacent to ORAR If within ORAR, at minimum as wide as the widest point on the ORAR Slope 1:48 max (if surface is other than asphalt, concrete, or boards, max slope of 1:20 allowed if necessary for drainage.)
Trails	
Surface	Firm and Stable
Clear Tread Width	36 in min
Passing Spaces	For trails less than 60 in wide must provide passing spaces every 1000 ft. Must be 60 by 60 in min
Tread Obstacles	Max ½ in above ground
Openings	Shall not allow a ½ diameter or larger sphere to pass
Slopes	Table 1017.7.1
Cross Slope	1:48 max (if surface is other than asphalt, concrete, or boards, max cross slope of 1:20 is allowed if necessary for drainage.)
Resting Intervals	60 in long min If adjacent to trail tread, 36 in wide min If within trail tread, width must be at least as wide as the widest point on the trail tread segment leading to the resting interval Slope 1:48 max (if surface is other than asphalt, concrete, or boards slope 1:20 max is allowed if necessary for drainage)

Turning Space	max slopes 1:48 Circular spaces must in 60 in in diameter See figure
Protruding Objects	Objects with leading edges between 27 and 80 in above ground surface can protrude into the clear width area up to 4 in.
Trailhead Signs	Length of trail / trail segment Surface Type Typical and minimum trail width Typical and maximum running slope Typical and maximum cross slope
Beach Access Routes	
Connections	Shall connect an entry point to the beach to the: High tide level at tidal beaches; Mean high water level at river beaches; Normal recreation water level at lake, pond, and reservoir branches.
Surface	Firm and stable
Clear Width	60 in min (except at dune crossings where min is 48 in if beach access route is not removable)
Obstacles	½ in max above ground (unless surface is other than asphalt, concrete, or boards when 1 inch is max)
Openings	Shall not allow ½ in or greater diameter sphere to pass
Slopes (does not apply to removable beach access routes)	Table 1018.7.1 (appendix) (Does not apply to removable beach access routes)
Cross Slope (does not apply to removable beach access routes)	Max 1:48 (where surface is other than concrete, asphalt, or boards 1:20 is max when necessary for drainage)

Resting Intervals (does not apply to removable beach access routes)	Required at top and bottom of segments between 1:20 and 1:10 slopes. 60 by 60 in min Max slope 1:48 (when surface is other than concrete, asphalt, or boards cross slopes no steeper than 1:20 allowed when necessary for drainage)
Protruding Objects	Objects with leading edges between 27 and 80 in above ground surface can protrude into the clear width area up to 4 in.
Dune Crossings (does not apply to removable beach access routes)	If slope of beach access route at a dune crossing exceeds 1:20 then handrails complying with 505 and curbs or barriers are required. Curbs or barriers shall not allow a 2 in diameter sphere to pass

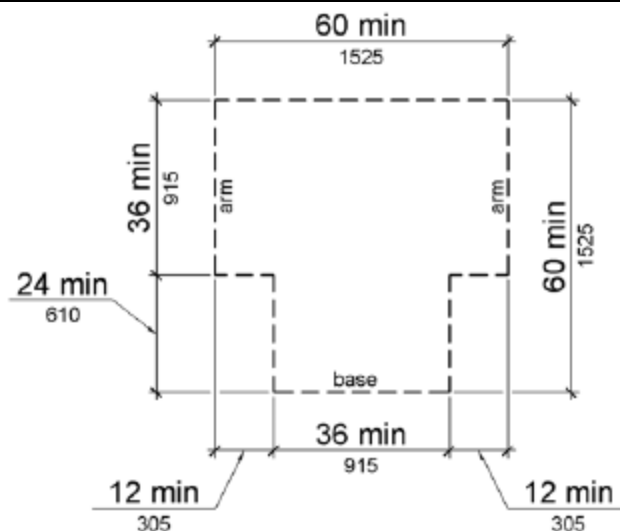


Figure 63: Turning Space (United States Access Board, 2016)

Table 2: Maximum Running Slope and Segment Length for Outdoor Areas

Running Slope of Outdoor Recreation Access Route Segment		Maximum Length of Segment
Steeper than	But not Steeper than	
1:20 (5%)	1:12 (8.33%)	50 feet (15 m)
1:12 (8.33%)	1:10 (10%)	30 feet (9 m)

Table 3: Maximum Running Slope and Segment Length for Trails

Running Slope of Trail Segment		Maximum Length of Segment
Steeper than	But not Steeper than	
1:20 (5%)	1:12 (8.33%)	200 feet (61 m)
1:12 (8.33%)	1:10 (10%)	30 feet (9 m)
1:10 (10%)	1:8 (12%)	10 feet (3050 mm)

Table 4: Maximum Running Slope and Segment Length for Beaches

Running Slope of Beach Access Route Segment		Maximum Length of Segment
Steeper than	But not Steeper than	
1:20 (5%)	1:12 (8.33%)	50 feet (15 m)
1:12 (8.33%)	1:10 (10%)	30 feet (9 m)

D.5 Possible Survey Questions

For those with disabilities:

1. Do you have a disability?
2. What is your favorite outdoor area to go to on the island?
3. Is the area accessible?
4. If not, what is the biggest obstacle you have to face? What do you think should be done to make it more accessible?
5. Are there any outdoor areas on the island you've heard of that are accessible but you have never been to?
6. Are there any outdoor areas that you want to visit but haven't had the opportunity to due to lack of accessibility?
7. Have you ever been to an accessible trail? If yes, where? What made it accessible? Is there anything missing?
8. Have you ever been to an accessible beach? If yes, where? What made it accessible? Is there anything missing?
9. Have you ever been to an accessible playground? If yes, where? What made it accessible? Is there anything missing?
10. What is your greatest concern when you're going to a new outdoor area?
11. Have you ever had to leave an outdoor area on Nantucket because it lacked accessibility features?

For those without disabilities:

1. What is your favorite outdoor area to go to on the island?
2. Is the area accessible?
3. Have you ever been to an accessible trail? If yes, where? What made it accessible? Is there anything missing?
4. Have you ever been to an accessible beach? If yes, where? What made it accessible? Is there anything missing?
5. Have you ever been to an accessible playground? If yes, where? What made it accessible? Is there anything missing?

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