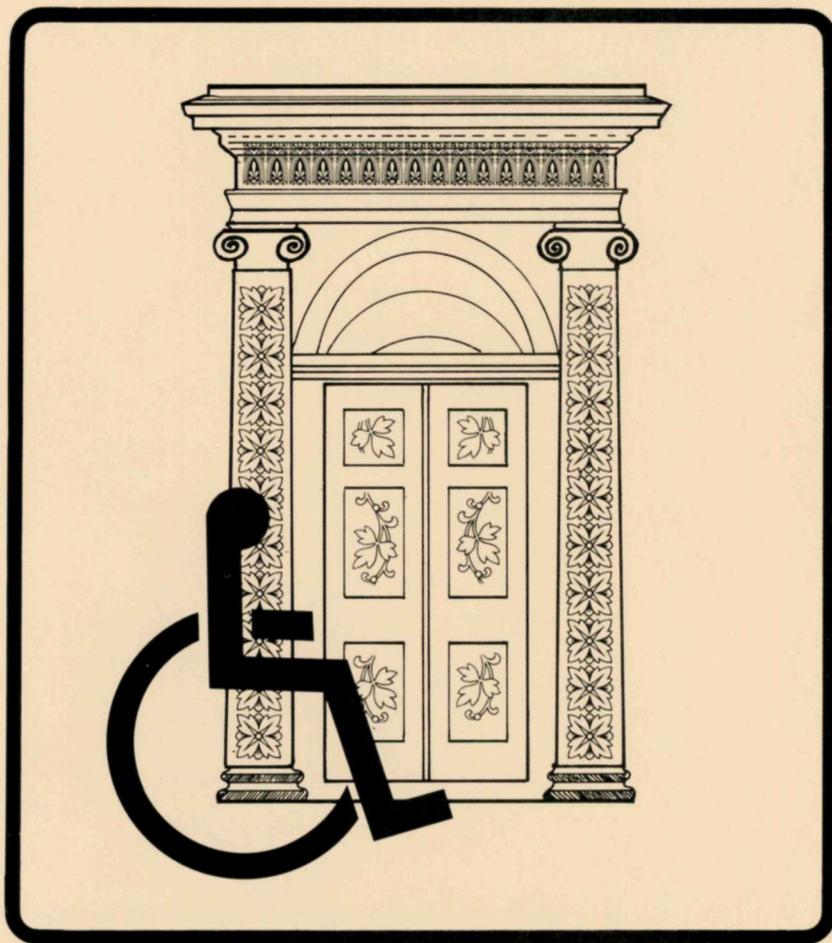


ACCOMMODATION
of
HANDICAPPED VISITORS
at
HISTORIC SITES



Volume 2
TECHNICAL MANUAL



U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

**ACCOMMODATION
of
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**Volume II
TECHNICAL MANUAL**

Prepared under Contract No. CX-2000-8-0021

from the National Park Service

U.S. Department of the Interior

by

Harold Russell Associates, Inc. (an 8''a'' Contractor)

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Introduction

This technical manual is meant to be read after reading the "Accommodation of Handicapped Visitors at Historic Sites: Volume 1: A Guide". The Guide contains important information about federal laws, National Park Service policies, and in addition, the Guide introduces the reader to what kinds of barriers exist at historic sites and the kinds of solutions available to eliminate them. The emphasis is on the kinds of things that can be done right away on a local level.

This manual is designed to help the specialists who are responsible for providing accommodation for handicapped visitors. This includes professionals such as architects, engineers, etc. at the Denver Service Center, Harper's Ferry Center, Regions, and WASO. The Denver Service Center now has a specialist for the handicapped on each team and one for historic projects. The roles of the specialists are explained; and the criteria that management decisions should be based upon are discussed.

Solutions to problems of physical accessibility are presented here in greater detail using the same priority listing as in the Guide. In most cases more than one option is given, along with the advantages and disadvantages of each option. Solutions are presented in this way because each site is different and there are a number of factors that will determine how handicapped visitors should be accommodated.

A device catalogue is included that lists the manufacturer and the approximate cost of the aids and devices designed especially for handicapped persons.

There are many things that can be done to upgrade the accessibility of historic structures, for at least some percentage of the handicapped population. Remember, the objective of the Park Service is to provide handicapped visitors with the highest level of accommodation, i.e., free and independent access to the site and its facilities, where it makes the least impact on the historic fabric. Physical access is described in terms of three levels: IDEAL, STANDARD, and BELOW STANDARD. As described in the Guide, Standard Physical Access adopts the "ANSI Standards". Ideal Physical Access is a compilation of standards from the GSA "Design Criteria": New Public Buildings Accessibility" and state accessibility standards. Below Standard Physical Access is less than the federal ANSI minimum and involves a judgement as to whether acceptable physical access is achieved.

Where physical access cannot be achieved according to one of the three levels described above, administrative changes and modified visitor interpretation programs should be considered.

Historic preservation is just as important to the handicapped population as it is to everyone else. A spirit of commitment and the willingness to think creatively and explore all possible options can make the goals of accommodation and historic preservation work together for the benefit of all.

Chapter 1

The Specialist's Role in Accommodation

The specialist plays an important role in assisting Park Service managers to upgrade accommodations for handicapped visitors. As described in greater detail below, this role consists of assessing the historic features and accessibility problems of the structure; developing creative or alternative solutions to problems; and recommending a course of action to managers. If construction is indicated, the specialist will develop construction documents, coordinate the award of the contract and supervise construction. Finally, a historic preservation guide will be created which provides guidance for continued preservation of the structure.

The specialist's thorough understanding of the historic features of the structure provides an excellent position to recommend actions which allow handicapped individuals to experience the structure and its interpretive program in as integrated a setting as possible. The preferred goal of accommodation is to afford handicapped people access to the structure using the same entrance(s), path of travel, interpretive programs and other visitor facilities as so called "able bodied" visitors. In many cases building alterations which could be made at a modern facility will be incompatible with historic preservation. Other alternatives must be sought, such as minor alterations which are reversible, temporary modifications or the addition of devices to assist handicapped people.

During the development of alternatives, it is essential for a Denver Service Center Historic Architect to work closely with the Regional Interpreter and the Regional Architect. The Denver Service Center Historic Architect and the Regional Architect are key figures in proposing physical accessibility solutions to accommodation and evaluating the level of access (STANDARD, IDEAL, BELOW STANDARD) that would be achieved. Architects are also responsible for assessing the impact of a particular accessibility solution on the historic fabric and answering such questions as:

- Might permanent destruction of historic fabric be involved?
- Is the solution reversible?
- Is a visual intrusion involved?
- Is the solution in keeping with sound design principles and "The Secretary of Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings?"
- Does it limit accessibility for non-handicapped visitors, i.e., path of travel and visitor flow?
- Are there safety considerations?
- What is the likely cost and time required for implementation?

The Regional Interpreter, along with Harpers Ferry Center can suggest changes in the interpretation program which enhance the enjoyment of the cultural resource by handicapped individuals. In addition, the Interpreter can recommend alternate accommodations to be made if physical access cannot be achieved or is incomplete, e.g., access to the first floor, but not the second.

The emphasis during such accommodation should be placed on what can be done, both in the long and short run. A design solution which will take extensive planning, budgeting and development work should accompany a plan of action which provides some accommodation in the near future. The Regional Interpreter, once again, can play a vital role in designing practical programs which allow handicapped individuals to experience the site and its story while modifications are implemented.

A sample series of steps to achieve accommodation is described below. This should be used as a general guide to action and not as strict instructions.

Recommended Steps to Achieve Accommodation

1. Planning Documents

During the development of New Area Studies, the General Management Plan, Environmental Assessment, Interpretive Prospectus, Development Concept Plan, and the Historic Resource Study, handicapped access should be surveyed using the Brief Accessibility Checklist and objectives set. Some simple solutions should be implemented immediately. Others should be planned for and programmed funds allocated for future development.

2. Design Documents

a. Historic Structures Report (HSR)

When a Historic Structures Report for proposed development is being created or modified is a logical time to address specific accommodation for handicapped persons. When the historic features are identified and assessed, the Specialist should note the status of accessibility. Recommendations concerning restoration or reconstruction should include ways of upgrading accessibility.

b. Classify the Structures

It is important to classify and evaluate the structure according to several factors:

- a) Category of Significance.
- b) Reason for Significance.
- c) Treatment.
- d) Use or Function.
- e) Yearly Visitation.
- f) Location.
- g) Staffing.

c. Detailed Survey of the Structure and its Site

During the planning process, the park manager will use the Brief Accessibility Checklist in the Guide to identify major problems. The specialist will then be called in to study the problems further, develop alternative solutions and recommend actions. It is essential that the specialist survey the structure in detail to gather information and confirm the initial assessment by the park manager. The Detailed Survey Checklist provided (Chapter 3, page 15) should be used for this purpose. The checklist is designed to assess each feature of the structure according to the three levels of standards, IDEAL, STANDARD (according to ANSI), and BELOW MINIMUM, but affording some accessibility. The IDEAL and STANDARD levels are defined in Chapter 3.

The determination of BELOW MINIMUM (less than legally minimum) involves a judgement of what works. Chapter 2, "Functional Limitations of Physical Disabilities" contains important information about the functional limitations of physical disabilities and methods for making and documenting decisions. This information (plus experimentation with wheelchairs and other devices) will be very helpful in determining what does work.

The objective here is to achieve the highest level of physical access with the least impact on the historic fabric. The appropriate level will vary according to whether the structure is being altered or preserved and if a feature is historic or non-historic. If the structure is in a stable condition and accommodations are contemplated in the context of preservation, then the objective is to obtain at least minimum access. If this is not feasible, then partial access should be attempted or alternate accommodation provided.

d. Evaluate the Results of the Survey.

By examining those questions which were answered NO, the specialist should be able to get a feel for the major accessibility problems. It is helpful in this regard to list the inaccessible portions of the structure on a sheet of paper in the order that they appear in the checklist.

The next important step is to define accessibility problems and list them in order of priority.

It is important when stating an accessibility problem to make it broad enough to encompass several barriers of the same type. Thus, a problem might be stated "Entrances to buildings are inaccessible to individuals in wheelchairs," rather than "Front entrance is inaccessible" or "Side entrance is inaccessible." This allows you to consider several optional ways of allowing handicapped individuals to enter the site. The problem should also be stated in terms which are specific and can be solved.

Listing problems in order of priority involves a determination of a sequence of events; the population of handicapped people affected by the problem; and some thought about the primary needs of people. Since the checklist questions are presented in the order in which one would tour the structure, they suggest that certain barriers must be overcome before others are reached. One should not address the problem of a narrow doorway until the problem of the narrow hallway leading to the door is addressed.

This process will result in a tentative list of major problems in order of priority. Barriers that can be removed easily need not be included in a final list of priorities because they should be removed as soon as possible. This list should be reviewed by the Park Superintendent. The Specialist and the Park Superintendent should work together in the determination of actions to be taken.

e. List and Evaluate Alternative Solutions for Each Priority Problem.

The Accommodation Worksheet on Page 30 is provided for this purpose. It assists the specialist in evaluating each solution according to the criteria of accommodation benefit, effect on the historic fabric, cost, time, impact on NPS staff, safety and other factors. It assists in making an objective rating according to certain criteria, and allows another individual to review the evaluation process which the specialist went through in coming to certain conclusions. Chapter 5, entitled, "Typical Solutions to Typical Problems" will assist in defining optional solutions. It is to be looked upon as suggesting common solutions and not as an exhaustive list of every option. Much rests on the creativity of the specialist here in defining solutions which provide accommodation and preserve the historic fabric. Many solutions are situational and exist because of certain unique features of the structure and its site.

f. Recommend Favorable Solutions and Implementation Steps.

The development of a plan for accommodation will likely be a joint process with the Park Superintendent, Region, and other specialists. The Regional Interpreter and staff from the Harpers Ferry Center will be involved here if the solution(s) involve changes in the interpretive program.

Once solutions are decided upon, an implementation plan should be developed. In many cases this will involve design development, construction drawings, specifications, and contract procedures. In other cases, the process will not involve building alteration, but will require budgeting. In any case, it is important to focus on both long and short range actions.

Chapter 2

Functional Limitations of Physical Disabilities

In order to accommodate handicapped visitors, it is important to have some knowledge about the functional limitations distributed throughout the handicapped population. Familiarity with the limitations and needs of handicapped visitors will, at the very least - put standards and specifications into a human perspective.

The following pages give an overview of the four general categories of handicaps: what conditions are included in each category and what functional limitations are shared by persons in each category. See the Bibliography at the end of this Manual for sources of additional information about handicaps.

A. PARTIAL MOBILITY IMPAIRMENTS

This term, as it is used here, refers to all persons who walk or use their arms or hands with difficulty, insecurity or lack of coordination. This may include persons who:

- use crutches
- use braces
- use braces and crutches
- use special shoes
- have heart disease
- have emphysema
- have arthritis
- have palsy
- have amputations (with or without prosthetic limbs)
- have had a stroke
- are pregnant
- have sprains, fractures, or broken bones

FUNCTIONAL LIMITATIONS

The kinds of partial mobility impairments and their causes vary within this category of handicaps. However, there are common limitations shared by persons with partial mobility.

Some of the considerations in understanding the functional limitations of those with partial mobility impairments are:

Walking:

A person who has difficulty walking, for whatever reason, may lose balance and fall when the surface is not smooth, not firm, or is slippery. For example: a foot that drags or has no sensation cannot react to an obstacle in time to prevent an accident.

Climbing:

Climbing, whether it be stairs or a steep path, can pose various problems which include:

- maintaining balance if no handrails are present (or handrails are too low)
- tripping over a projecting nosing
- inability to raise a leg over a high step
- loss of breath or feeling of dizziness if there is nothing to hold on to for rest.

Stamina:

Most persons with partial mobility impairments tire easily. In some cases this is because they use more energy in walking and standing. In other cases, this is because they are in a weakened state.

Thirst:

Many persons require frequent drinks of water. This may be attributable to a particular disease or condition; the medication for a disease or condition; and to the level of energy required to perform certain physical activities.

Dexterity:

If a person's arm or hand is paralyzed, arthritic, weak or numb, or if an arm or hand is missing there will be difficulty in manipulating something that is heavy, intricate, or requires grasping to operate.

B. TOTAL MOBILITY IMPAIRMENTS

This term, as it is used here, refers to persons who use wheelchairs. Very simply, people use wheelchairs because they cannot walk. There can be many reasons for this. An accident, disease, or genetic defect affecting the spinal column, neuro-muscular system, or certain parts of the brain can result in the loss of lower-limb mobility.

In many cases, a person in a wheelchair has a lack of mobility in other parts of the body.

Some of the ways a person may be affected include:

- loss of movement or feeling in the lower extremities.
- loss of movement and feeling in the lower extremities and lower torso.
- loss of movement and feeling in lower extremities, torso and upper extremities.
- loss of movement from the neck down.
- uncontrolled movement, ranging from the extremities to the entire body, including the face.

FUNCTIONAL LIMITATIONS

The functional limitations among people in wheelchairs vary greatly. The largest determining factor is the degree of lost mobility. (When visiting a historic site a person who lost lower limb movement is at a greater disadvantage than a person who has only lost manual dexterity.)

The following are some considerations in understanding the functional limitations of persons in wheelchairs.

Getting Around:

For all practical purposes, a person in a wheelchair can do only what a wheelchair can do: wheelchairs don't climb. When the wheels (or foot rests) of a wheelchair meet an obstacle, even a rise of one inch, the wheelchair stops. A certain amount of strength is required to push over any abrupt rise in elevation. Many people do not have this strength.

The dimensions of a wheelchair are a very important consideration for getting around. The average width of a wheelchair is 27". When a wheelchair is not automatic (and most are not) the average width of a wheelchair, plus the elbow extension of the person is 30". The above figures are averages. A wheelchair fitted for an obese person or one with special attachments may be as wide as 30".

In addition to requiring a certain width for moving from one place to another, a wheelchair requires a certain amount of space for making a 360 degree turn. This is approximately 60" x 60".

Seeing:

Because a person in a wheelchair is in a seated position, the eye level is considerably lower than the general population. Anything that should be seen at eye level and is higher than 40 inches is inappropriately placed for a wheelchair user.

Reaching:

Being in a seated position also affects the arm reach of a person in a wheelchair. The average vertical reach does not exceed 54 inches; diagonal reach does not exceed 48 inches.

Dexterity and Strength:

When a person's upper extremities are affected, the ability to push (doors, etc.), manipulate (hardware, levers, etc.) or handle (brochures, tickets, etc.) may be limited entirely or partially.

C. VISUAL IMPAIRMENTS

A visual impairment may be caused by a disease, accident or genetic defect of the eye or certain parts of the brain. A gradual loss of sight often accompanies old age.

The two basic classifications for severe visual impairments include:

Legal blindness:

A person can see at 20 feet (or less) what a normally sighted person can see at 200 feet.

A person's field of vision is less than 20 degrees in diameter.

These classifications can be explained further by describing the different kinds of sight experienced among the visually impaired population. These differences include:

- sight within a narrow field (tunnel vision);
- sight out of one corner of an eye;
- fuzzy sight;
- sight of forms and shapes;
- perception of light only.

FUNCTIONAL LIMITATIONS

There are varying degrees and kinds of sight that make visually impaired persons different from one another. The type of sight loss, the age of onset, the quality of special education received, and the level of personal adjustment will affect an individual's ability to function.

The following are some important considerations in understanding the functional limitations of visually impaired persons:

Perception:

Eighty percent of visually impaired persons retain some degree of sight. Therefore, visually impaired persons rely on sight as much as possible. In most cases, this residual sight is useful when the person stands closer to something than a normally sighted person.

In absence of sight, totally blind persons see with their senses of touch and hearing.

Reading:

Many visual impaired persons can read printed matter if the print is 18 point or larger. A sign can often be read if the letters are 4" high in light colors on a dark background. Only 10% of blind persons read Braille.

Getting Around:

People who have been blind for some period of time usually receive orientation training. This enables them to walk in straight lines and follow clear directions.

D. HEARING IMPAIRMENTS

The human ear is a delicate and complex organ. A disease, accident or birth defect affecting one or more parts of the ear, can result in a hearing impairment. A gradual loss of hearing is also part of the normal aging process.

The following classifications are based upon the degree of hearing lost in the speech range:

Slight loss:

Difficulty in hearing whispered speech.

Moderate loss:

Difficulty in hearing distant speech, soft speech, and speech mixed in with other noises.

Marked loss:

Difficulty in hearing speech unless the voice level is raised, the distance is short, and no other noises are present.

Severe loss:

Difficulty in hearing speech even if it is shouted.

Profound loss:

Difficulty in hearing the sound of the voice no matter how high the level of sound.

FUNCTIONAL LIMITATIONS

When a person's hearing is impaired the ability to communicate and to learn is also impaired. For Specialists concerned with physical accessibility the important thing to remember is that anything designed only to be heard, such as a fire alarm bell, will be ineffective for many hearing impaired persons.

Chapter 3

Surveying the Site

Chapter 1 discussed the specialist's role. Under "Recommended Steps to Achieve Accommodation", a detailed survey of the structure and its site was suggested (see page 3).

This is an important task because it will show how each section of the site is connected to another. Wherever a barrier appears during a tour of a site (or its structure) the tour may be impossible (or very difficult) for handicapped visitors to complete.

Making a survey of a structure is the link between planning and taking action. In one sense, it will be the culmination of the planning research. In another sense, it will be the first step in deciding what changes may be made at a structure.

The survey is not a very difficult task. It involves little more than a complete and systematic tour of the structure and surrounding site. This tour will establish what barriers exist at a site and how these barriers affect a handicapped visitor.

In addition, the survey will give insight that will prove very useful when establishing priorities for barrier removal.

The following information tells how to make a proper survey.

1. Checklist.

Use the Detailed Survey Checklist (on pages 15-25) as the tour is being made. The checklist will serve as a guide to identifying possible barriers; and serve as a record for what is found.

As much as possible, the checklist attempts to follow the order of a typical tour. However, some things about sites cannot be anticipated in a general checklist. For example, the location of toilets, telephones and water fountains will vary from site to site.

Wherever these facilities appear during the tour, turn to those pages of the checklist that refer to them.

2. Public Involvement.

The existence of barriers (and certainly the importance of barriers) is not always apparent to an able-bodied person. Therefore, it is a good idea for the assessor to invite a handicapped person to make the tour during the assessment.

For best results, a person in a wheelchair and a blind person should be invited to go along on the tour. Also, problems should be discussed with other types of handicapped persons. Barriers to handicapped people in general will be readily identified.

3. When to Make the Assessment.

Assess the site when it is open to the public. A site with many people around will set the scene for a more accurate assessment. The assessor will have a clearer picture of how traffic flow and staff assistance contribute to the experience of the tour.

Detailed Survey Checklist

DIRECTIONS FOR USING THE DETAILED SURVEY CHECKLIST

The first three columns of this checklist contain information about accessibility.

- The column labeled "STANDARD" contains questions that are based on the "American National Standard Specifications for Making Buildings and Facilities Accessible to, and Usable by, The Physically Handicapped" (ANSI A117.1-1961) ANSI specifications are the current* legal minimum standards as adopted by the General Services Administration. (See "Accommodation of Handicapped Persons at Historic Sites: Volume I - A Guide". Chapter 5.)
- The column labeled "IDEAL" contains specifications that exceed ANSI standards. The General Services Administration's "Design Criteria for New Buildings" as well as certain states' building codes set forth specifications which, in some cases, exceed the ANSI standards.
- The column labeled "ADDITIONAL TECHNICAL INFORMATION" contains information which will assist specialists in making an accurate survey. In some cases, this information will assist specialists in determining if a condition is "BELOW STANDARD" but does afford accessibility.

1. Circle the word "Historic" or "Non-Historic" found in the "STANDARD Column" under each section heading.
2. Read the question listed under column: "STANDARD". Then read the information provided in column: "IDEAL" and column: "ADDITIONAL TECHNICAL INFORMATION".
3. Check one of the thinner columns to the right, according to the following:
 - Check "IDEAL" if the surveyed item meets the standard described under the column labeled "IDEAL".
 - Check "STANDARD" if the surveyed item meets the ANSI standards described in the column labeled "STANDARD".
 - Check "BELOW STANDARD" if the item surveyed does not meet the "STANDARD", but you believe reasonable accessibility is provided for handicapped visitors. If you check "BELOW STANDARD", you must describe how reasonable accessibility is provided. Do this in the column labeled "COMMENTS".
 - Check "NOT ACCESSIBLE" if the item surveyed does not provide reasonable accessibility for handicapped visitors.
 - Check "NOT APPLICABLE" if the question does not apply to any feature at the site.
4. Make notes in the column labeled "COMMENTS", for the following reasons:
 - There is a check in the column labeled "BELOW STANDARD": explain accessibility.
 - A question applies to more than one item at a site: Describe item and level of accessibility.
 - You can provide measurements and notes that will be of assistance in describing a condition at a later date.

*During 1979, ANSI A117.1-1961 is in the process of revision. Before using this checklist, it is important to find out if 1961 standards have been superceded by more recent standards.

STANDARD	IDEAL	ADDITIONAL TECHNICAL INFORMATION	Ideal Standard Below Standard Not Accessible Not Applicable	COMMENTS
<u>PARKING LOTS</u>				
Historic Non-Historic				
1. Spaces reserved and identified for use by individuals with physical disabilities?	International Symbol of Accessibility used for identification.	Signs should be elevated, not painted on ground.		
2. Parking spaces, open on one side, allowing room (12 ft.) for individuals in wheelchairs or with braces and crutches to get in and out on a level surface?	Spaces 13 ft. wide or a pair of 8 ft. spaces sharing a common 5 ft. parking access aisle or 9 ft. spaces sharing a common 4 ft. aisle.	Special spaces might be located at end of lot, using available walks or driveways as entering and disembarking areas. Special parking spaces at sidewalk should have curb ramp.		
3. Accessible spaces close to the facility?	Near the accessible entrance of each building or facility.			
4. Distribution of spaces for use by the disabled in accordance with the frequency of parking needs?	One special space for first 25 spaces. Two special spaces for 26-40 spaces. Three special spaces for 41-100 spaces. Four special spaces for 101-200 spaces. Five special spaces for 201-500 spaces.	Staff should be prepared to assist visitors when requested. Disembarking area should be provided closest to public entrance.		
<u>WALKS</u>				
Historic Non-Historic				
5. Public walks minimum 48" wide?	Same as Standard	Wheelchairs require a minimum 36" wide path of travel.		
6. Walks slope not greater than 5 percent (5 units horizontal or 1 per 20)		It is fatiguing and/or dangerous for mobility impaired persons to go up or down a ramp that has a steep vertical or cross slope. If slope is steeper than 1 in 20, walk should comply with standards for a ramp. (See Question No. 11-19)		

STANDARD	IDEAL	ADDITIONAL TECHNICAL INFORMATION	Ideal Standard Below Standard Not Accessible Not Applicable	COMMENTS
7. Walks of a continuous common surfact, not interrupted by steps or abrupt changes in level?	Smooth, hard, clean slip-resistant surface with no abrupt change in level or more than 1/2".			
8. Walks blend to a common level wherever they cross other walks, driveways, or parking lots?		A curb is a step and should be ramped (curb ramp or curb cut).		
9. Walks have a level platform at the top which is (a) at least 5 feet by 5 feet if a door swings out onto the platform or toward the walk, or (b) 3 feet by 5 feet if door swings away from platform?		The walk at each accessible doorway should extend sufficiently to permit a wheelchair to maneuver to unlatch the door, avoid the door swing, and enter conveniently.		
10. Platform extends at least 1 foot beyond each side of the doorway.		See technical Information for No. 9.		
<u>RAMPS</u>				
Historic Non-Historic				
11. Ramps slope no greater than 1 foot rise in 12 feet of length.				
12. Handrails on at least one side?	Handrails on both sides with hand-grip portion 1 1/4" - 1 1/2" in diameter.			
13. Handrails 32" in height measured from the surfaces of the ramp?	Handrails 33" high. Sides of ramps shall have additional rails, curbs or extensions to prevent wheelchairs and crutch tips from slipping off the sides.			
14. Handrails extend one foot beyond the top and bottom of the ramp?		Handrails should not extend if it would cause a safety hazard.		
15. Ramps have a surface that is not-slip?		The ramp should be non-slippery when wet.		

Ideal
 Standard
 Below Standard
 Not Accessible
 Not Applicable

STANDARD	IDEAL	ADDITIONAL TECHNICAL INFORMATION		COMMENTS
16. Ramps have a level platform at the top (same dimensions as No. 9)?		See Technical Information for No. 9.		
17. Platform extends at least 1 foot beyond each side of the doorway?		See technical information for No. 9.		
18. Ramps have at least 6 feet of straight clearance at the bottom?		Ramps should have at least 5 feet of clearance at the bottom of each run.		
19. Ramps have level platforms at 30 foot intervals for purposes of rest and safety, and making turns?		Ramps should not continue higher than a total of 102" vertically. Staff assistance is required if slope is steeper than 1 in 12.		
<u>ENTRANCES/EXITS</u>				
Historic Non-Historic				
20. At least one primary entrance to each building usable by individuals in wheelchairs?	The Main visitor entrance.	Secondary entrance.		
21. At least one entrance which is usable by individuals in wheelchairs on a level that would make elevators accessible?				
<u>DOORS AND DOORWAYS</u>				
Historic Non-Historic				
22. Doors have a clear opening of no less than 32" when open?	Clear opening of 34".	Wheelchair width when open: 27" average, 29" maximum. Wheelchairs are made as narrow as 23".		
23. Doors operable by a single effort?		Two leaf doors are not usable together by those with disabilities. They must operate by a single effort, and each leaf must be 32" clear.		

STANDARD	IDEAL	ADDITIONAL TECHNICAL INFORMATION	Ideal Standard Below Standard Not Accessible Not Applicable	COMMENTS
24. Doors operable by a force which could reasonably be expected from disabled persons?	Force of 15 lbs. max. for exterior doors, 8 lbs. for interior doors.			
25. Door closers allow the use of doors by disabled persons?	Same force as No. 24.			
26. Floor on the inside and outside of each doorway level for a distance of 5 feet from the door in the direction the door swings and extend 1 foot beyond each side of the door?		See technical information for No. 9.		
27. Sharp inclines and abrupt changes in level avoided at thresholds?	Exterior thresholds not greater than 1/2"; interior thresholds flush with the floor.	Thresholds can be beveled or removed and carpeting or runners put down.		
<u>STAIRS AND STEPS</u>				
Historic Non-Historic				
28. Steps avoid abrupt nosings?		Nosings are the extension of the tread beyond the riser.		
29. Stairs have hand-rails 32" high as measured from the edge of tread at face of the riser?		Carpeting is acceptable way to round-off nosing.		
30. Stairs have at least one handrail that extends at least 18" beyond the top and bottom step?		Handrails need not extend if it would cause a safety hazard, or if space does not permit.		
31. Steps have risers less than 7" high.				
<u>FLOORS</u>				
Historic Non-Historic				
32. Floors have a non-slip surface?				
33. Floors on each story at a common level or connected by a ramp?		A portable ramp might suffice.		

STANDARD	IDEAL	ADDITIONAL TECHNICAL INFORMATION	Ideal	Standard	Below Standard	Not Accessible	Not Applicable	COMMENTS
<u>PUBLIC TOILET ROOMS</u>								
Historic Non-Historic								
34. Appropriate number of toilet rooms for each sex that are accessible to and usable by physically handicapped persons?	At least one accessible toilet room for each sex.	A staff toilet where permitted by code, may be considered if public toilets cannot be made accessible.						
35. Toilet rooms have turning space 60" x 60" to allow traffic of individuals in wheelchairs?		Space under wall hung lavatories can be used to provide turning space.						
36. Toilet rooms have at least one toilet stall that:								
a. is three feet wide	---5 feet wide	Transfer is easiest if the wheelchair is parallel to the toilet.						
b. is at least 4'8" deep?	---5 feet deep	Next preference is a diagonal position. Least preferable position.						
c. has a door that is 32" wide and swings out?	34" wide clear opening	Door must have 32" clear opening.						
d. has grab bars on each side, 33" high and parallel to the floor, 1 1/2" in diam., with 1 1/2" clearance between rail and wall, fastened securely to the wall at the ends and center?		Grab bar clearance must be exactly 1 1/2 inches between rail and wall						
e. has a water closet with seat 20" from the floor?	Water closet with seat 17-19" from floor.	Many handicapped people prefer the conventional 16" height toilet seat.						
37. Toilet rooms have lavatories with narrow aprons, which when mounted at standard height are usable by individuals in wheelchairs?	29" clear opening under front of lavatory	Lavatories should be wall hung (i.e., no legs or pedestal).						
38. Drain pipes and hot water pipes covered or insulated?	Pipes may be recessed.							

STANDARD	IDEAL	ADDITIONAL TECHNICAL INFORMATION	Ideal Standard Below Standard Not Accessible Not Applicable	COMMENTS
39. Some mirrors and shelves at a height as low as possible and no higher than 40" above the floor?	38" preferable.	Mirrors may be angled for seated view.		
40. Toilet rooms for men have wall mounted urinals with the opening of the rim 19" from the floor, or have floor mounted urinals that are level with the main floor of the toilet room?	17" high at rim of urinal	Floor mounted urinals do not conform to some state codes.		
41. Toilet rooms have towel and other dispensers and disposal units mounted no higher than 40" from the floor?		In many states 42" is acceptable.		
42. Towel dispensers and disposal units located to the side of the lavatory rather than directly above?	Should be within reach from wheelchair.	Rather than relocate existing dispensers, add one additional unit.		
<u>DRINKING FOUNTAINS</u>				
Historic Non-Historic				
43. Appropriate number of drinking fountains accessible to and usable by persons in wheelchairs; rim 36" or less from the floor?	36" to spout	If desirable, paper cups may be used as an alternative.		
44. Water fountains have spouts and controls located close to the front and hand operated?		Wheelchair type drinking fountains must be wall mounted so wheelchair can get under.		

STANDARD	IDEAL	ADDITIONAL TECHNICAL INFORMATION	Ideal	Standard	COMMENTS
<u>PUBLIC TELEPHONES</u>					
Historic Non-Historic					
45. Appropriate number of public telephones accessible to persons in wheel-chairs?	At least one accessible telephone wherever public telephones are provided.	If public phone is not accessible, private phone should be provided. Phones should be located in an accessible enclosure.	↓	↓	
46. Height of dial from floor 48" or less?			↓	↓	
47. Coin slot located 48" or less from the floor?		Telephone policy is 54" to coin slot for all new public phones.	↓	↓	
48. Telephones equipped for persons with hearing disabilities and so identified?		May be identified by blue grommet at handset.	↓	↓	
<u>ELEVATORS</u>					
Historic Non-Historic					
49. If more than a 1-story building, are elevators accessible to and usable by physically handicapped persons?			↓	↓	
50. All controls 48" or less from the floor?			↓	↓	
51. Floor numbers raised or recessed on contrasting background and located adjacent to floor buttons?	Numbers should be located to the left of buttons.	New elevators should comply with NEII standards.	↓	↓	
52. Elevator car at least 5' x 5'?		3' x 4' 6" minimum; preferably for one floor only. Room is needed for wheelchair <u>and</u> attendant.	↓	↓	

STANDARD	IDEAL	ADDITIONAL TECHNICAL INFORMATION	Ideal Standard Below Standard Not Accessible Not Applicable	COMMENTS
<p><u>CONTROLS</u></p> <p>Historic Non-Historic</p> <p>53. Switches and control controls for light, heat, ventilation, window draperies, fire alarms, intercoms, thermostats, and all similar controls of frequent or essential use, within the reach of individuals in wheelchairs?</p>		<p>Safety requires that fire alarms be within reach, 54" maximum, preferable is 48".</p>		
<p><u>IDENTIFICATION</u></p> <p>Historic Non-Historic</p> <p>54. Raised or recessed letters or numbers used to identify rooms or offices?</p> <p>55. Identification placed on the wall, to the right or left of the door at a height of 4'6" to 5'6" above the floor?</p> <p>56. Doors not intended for normal use, that might prove dangerous if a blind person were to exit or enter by them made quickly identifiable to the touch by knurling the door handle or knob?</p>	<p>Between 6" and 18" from door jamb at latch side.</p>	<p>Knurling should be applied to back of hardware; may be applied with handfile.</p>		
<p><u>WARNING SIGNALS</u></p> <p>Historic Non-Historic</p> <p>57. Audible warning signals accompanied by simultaneous visual signals for the benefit of those with hearing or sight disabilities?</p>				

STANDARD	IDEAL	ADDITIONAL TECHNICAL INFORMATION					COMMENTS
<p><u>HAZARDS</u></p> <p>Historic Non-Historic</p> <p>58. When manholes or access panels are open, or when open excavation exists on a site where it is close to normal pedestrian traffic, are barricades placed on all open sides at least 8' from the hazard with warning devices installed?</p> <p>59. Low-hanging door closers avoided (those which remain within the opening of a doorway, or that protrude hazardously into regular corridors or traffic ways)?</p> <p>60. Signs, ceiling lights, fixtures or similar objects located to avoid protruding into regular corridors or traffic ways?</p> <p>61. Lighting on ramps adequate?</p> <p>62. Exit signs easily identifiable to all disabled persons?</p>		<p>A minimum height of 7', measured from the floor is recommended.)</p>					

Ideal
 Standard
 Below Standard
 Not Accessible
 Not Applicable

Chapter 4

Accommodation Worksheet

The attached worksheet should be used to analyze different solutions to major accessibility problems that you have already defined. The criteria listed will help you evaluate each solution in a systematic manner. Criteria should be added if they apply.

To the right of each criterion, jot down a few notes which characterize how well the solution meets the criterion. The terms Asset (+), Liability (-) and Not Applicable (NA) are suggested to help you summarize your rating. Place a (+), (-) or (NA) in the circle in the upper right corner of each box. It is important to note this analysis does not involve a numerical rating, but the process should be as objective as possible. The relative importance of each criterion will have to be determined along with which solution(s) are best. The worksheet basically helps to organize and document the assessment and allows another person to understand why you made a particular accessibility recommendation.

DESCRIPTION OF WORKSHEET ITEMSAccommodation Problem

It is important when stating an accessibility problem to make it broad enough to encompass several barriers of the same type. Thus, a problem might be stated "Entrances to buildings are inaccessible to individuals in wheelchairs" rather than "Front entrance is inaccessible," or "Side entrance is inaccessible." This allows you to consider several optional ways of allowing handicapped individuals to enter the structure. The problem should also be stated in terms which are specific and can be solved.

Proposed Solutions

List all reasonable solutions to the stated problem.

PRIMARY CRITERIAAccommodation Benefit

This primary criterion addresses the benefit which handicapped individuals will gain from the solution. It contains two elements:

1. Most Integrated Setting Appropriate -

This element concerns the extent to which handicapped individuals can enjoy the site and its facilities in the same setting or manner as an "able bodied" individual. This means handicapped people should enter through the main visitor entrance rather than through a back door which is used only by handicapped individuals, and would be considered unacceptable by an able-bodied person.

2. Disability Populations Benefitted -

This element considers the nature of the disability, i.e., mobility, vision, hearing, learning, etc., and addresses how much of the handicapped population will benefit from the solution. The population chart in the Guide, Chapter 2, "Who Benefits From Accommodation" can be used to estimate the number of handicapped visitors who would benefit.

Effect on Historic Fabric Benefit

This primary criterion addresses the effect of the proposed solution on the historic features of the building. The notion of reversability is an important aspect of this criterion.

SECONDARY CRITERIACost

Cost to achieve the solution. A list of typical costs for barrier removal is included on Pages 81-84.

Time

Time needed to achieve the solution. Typical times are also provided in the list on pages 81-84.

Impact on NPS Staff

The extent to which staff will be needed to supervise, provide assistance, administer, etc.

Safety

The implication of the solution on emergency exit, fire regulations, visitor and staff liability, etc.

Other Considerations

Maintenance

Vandalism

Intrusion on other visitors

Other

ACCOMMODATION WORKSHEET

HISTORIC SITE: _____

ACCOMMODATION PROBLEM:

EVALUATOR _____ DATE _____

PROPOSED SOLUTIONS	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
ACCOMMODATION BENEFIT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EFFECT ON HISTORIC FABRIC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
COST	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TIME	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IMPACT ON NPS STAFF	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SAFETY	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
OTHER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SUMMARY				
RECOMMENDATION				

Chapter 5

Typical Solutions to Typical Problems

This chapter follows the format of the Guide, that is, priority problem areas and typical solutions are presented in terms of primary areas and secondary areas. These are:

Primary Areas

Access to:

1. The Building
2. The Main Floor
3. Toilet Facilities
4. The Site

Secondary Areas

Access to:

5. Other Floors
6. Parking
7. Drinking Fountains
8. Telephones

Typical solutions are presented for each problem along with the advantages and disadvantages of each solution. Administrative and Interpretation alternatives to physical access are addressed in the Guide.

PRIMARY AREAS1. ACCESS TO THE BUILDING

The purpose of coming to a historic site is to visit the historic structure at the site. Therefore, the first priority ought to be finding a way for all visitors to get into a building-easily and safely.

The most desirable solution to any accessibility problem is one that is permanent and does not segregate handicapped visitors.

In most cases, making a front entrance accessible to persons in wheelchairs will significantly alter the appearance of the structure. Therefore, it may be best to examine an alternate entrance. Alternate entrances often present fewer problems of accessibility; and making them accessible will be less damaging to the historic appearance of the structure and less intrusive.

Most entrances are made up of many parts, i.e., steps, platform, door and thresholds. Any one of these parts may be a barrier or a hazard to many handicapped visitors.

A. Steps

PROBLEM: One or more steps is a barrier to visitors in wheelchairs.

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
Install a <u>permanent (reversible) ramp</u> from grade to floor level	<ul style="list-style-type: none"> Is a permanent solution Eliminates the need for staff assistance Requires little maintenance and maintenance cost 	<ul style="list-style-type: none"> Is an obvious modern addition Is an intrusion on the historic scene Takes up a great deal of space at a slope of 1-in-12 (a 24 inch rise requires a 24 foot ramp) Is expensive--cost varies with number of steps
Provide a <u>portable ramp</u>	<ul style="list-style-type: none"> Is less expensive than a permanent ramp; costs from \$250 to \$1,000 Has less effect on historic appearance Requires little maintenance and cost May be left in place 	<ul style="list-style-type: none"> Is not practical for more than four steps--ramp would be too heavy to be portable Requires staff assistance when moved to and from entrance Requires storage space Can be heavy and cumbersome Is likely to be steeper than a permanent ramp, thus may require staff assistance to push wheelchairs up and down ramp Usually is made without railings

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
<p>Install a <u>vertical lift</u> from grade to floor level</p>	<p>Is a permanent solution Takes up less space than a permanent ramp Is practical to about 6 feet of vertical rise Is a reversible solution</p>	<p>Is an obvious modern addition Is an intrusion on the historic scene Requires some kind of shelter or cover to protect parts Requires staff assistance to operate Requires maintenance Is expensive - may cost from \$2,000 - \$4,000 Requires a 5 foot by 5 foot level platform between lift and entrance door Is subject to vandalism Is subject to mechanical failure Is subject to electrical failure</p>
<p>Install an <u>inclined lift</u> from grade to level platform</p>	<p>Is a permanent solution Takes up little space Is a reversible solution</p>	<p>Is an obvious modern addition Is an intrusion on the historic scene Requires staff assistance to operate Is expensive - may cost from \$3,000 - \$4,000 Requires a 5 foot by 5 foot level platform between lift and entrance door Is subject to mechanical failure and maintenance Is subject to electrical failure May be a hazard to other visitors</p>

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
Install an <u>exterior elevator</u> from grade to each floor level	<p>Is a permanent solution</p> <p>Allows access to each floor level</p> <p>Does not affect structural members</p>	<p>Is an obvious visual intrusion</p> <p>May result in destruction of historic fabric - requires cutting a doorway into building at each floor</p> <p>Is expensive. Costs from \$40,000 and up</p> <p>May disturb interior plan of building</p> <p>Is not a reversible solution</p>
Regrade land over <u>steps</u>	<p>Is a permanent solution</p> <p>Is a reversible solution</p> <p>Eliminates the need for staff assistance</p> <p>May not be a visual intrusion</p>	<p>Is generally not practical for more than two steps</p> <p>Takes up a great deal of space. (To overcome a 12 inch rise, an area of over 300 square feet is required to provide a rise of not more than 1 in 20)</p> <p>May change appearance of entrance and historic scene</p> <p>Involves a change in the site, which is also historical</p> <p>May introduce problems related to moisture and insects</p>

PROBLEM: High steps may be a barrier to visitors with mobility impairments.

Install new <u>steps</u>	<p>Is a permanent solution</p> <p>Minimizes the need for staff assistance</p> <p>May be reversible</p>	<p>Is a modern change</p> <p>Is expensive - may cost \$250 per linear foot</p> <p>Does not accommodate wheelchairs</p>
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TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
<p>B. <u>Railings</u></p>		
<p>PROBLEM: <u>Unrailed steps or improperly railed steps</u>, i.e.,: one railing, low railings, wide railings may be a barrier or a hazard to visitors with visual impairments and those who walk with instability</p>		
<p>Install <u>permanent handrails</u> at each side of steps</p>	<p>Is a permanent solution Is relatively inexpensive Can be designed to blend with present architecture if desired. Allows independent access</p>	<p>Is visual intrusion Anchoring holes in steps and building may damage fabric and be irreversible May present design problem - particularly on short runs, i.e., 2 or 3 steps</p>
<p>Install <u>free standing handrails</u> at each side of steps (anchored in adjacent ground, not attached to structure)</p>	<p>May be a permanent solution. Minimizes need for staff assistance May blend in better with architecture than a handrail Is a reversible solution</p>	<p>May not be as secure as a permanent handrail May not be as attractive as a permanent handrail</p>
<p>Install <u>free standing newel posts</u> where there are only a few steps</p>	<p>May be a permanent solution Minimizes need for staff assistance May blend in better with architecture than a handrail Is a reversible solution</p>	<p>Is not as effective as a handrail</p>

C. Platforms

PROBLEM: Small or sloped platform (an area adjacent to a doorway that is not level or large enough to accommodate a wheelchair) is a barrier.

<p>Widen <u>platform</u></p>	<p>May be a permanent solution Eliminates need for staff assistance</p>	<p>Changes historic appearance May not be effective if platform is not deep enough Is expensive, may cost from \$2,000 to \$2,500 Is not a reversible solution</p>
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TYPICAL SOLUTIONSADVANTAGESDISADVANTAGESD. Doors and Doorways

PROBLEM: Narrow Doorway (a doorway with a clear opening of less than 27 inches wide) is a barrier to most visitors in wheelchairs or visitors using crutches. (A doorway 27 to 29 inches wide can be a barrier to those in wide wheelchairs.) A doorway less than 32 inches wide may make independent access difficult or impossible.

Replace present door and frame with a wider door frame

Is a permanent solution
Eliminates need for staff assistance
Can be made to look like former door

Changes historic proportions
May involve damage to historic fabric
Is a modern addition
Is expensive: may cost from \$1200 to \$1600
Is not a reversible solution

Replace hinges with offset hinges of similar design to provide wider clear opening

May be a permanent solution
Eliminates need for staff assistance
Is inexpensive
Is a reversible solution

Door must swing 180 degrees to be effective
Is a modern addition
Increases door opening by thickness of door only

PROBLEM: Heavy and/or quick closing doors (a door that requires more than 15 pounds of effort to open and/or a door that closes automatically, and doesn't stay open long enough) is a barrier for visitors in wheelchairs and those with mobility impairments.

Adjust closer

May be a permanent solution
Is cost-free
Eliminates need for staff assistance
Is a reversible solution

May not eliminate problem
May affect latching of door

E. Door Hardware

PROBLEM: High or difficult to operate hardware (a door with hardware that is higher than 42 inches and requires dexterity and manual strength to operate) is a barrier to visitors in wheelchairs and to many with mobility impairments.

Replace round door knob or thumb-latch with lever handle or door pull

Is a permanent solution
Eliminates need for staff assistance
Is relatively inexpensive, may cost approximately \$125

May change historic appearance

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
Add a <u>lever attachment</u> to a round door handle	<p>Is a permanent solution</p> <p>Eliminates need for staff assistance</p> <p>Is inexpensive</p> <p>Is a reversible solution</p> <p>Does not require the removal of hardware</p>	<p>May change historic appearance.</p>

F. Thresholds

PROBLEM: High thresholds (an unbeveled threshold more than one-half inch high, or a beveled threshold more than three-quarter inches high) is a barrier to visitors in wheelchairs and hazardous to those with mobility and visual impairments.

Remove <u>threshold</u>	<p>Is a permanent solution</p> <p>Eliminates the need for staff assistance</p> <p>Is inexpensive</p> <p>May be reversible</p>	<p>Leaves space at bottom of door</p> <p>May change historic appearance</p>
<u>Plane threshold</u> to make it lower	<p>Is a permanent solution</p> <p>Eliminates need for staff assistance</p> <p>Is relatively inexpensive, may cost from \$100. to \$200.</p>	<p>Changes historic appearance of threshold</p> <p>Leaves a space at bottom of door</p> <p>Is not a reversible solution</p>
Add <u>bevels</u> to both sides of threshold	<p>Is a permanent solution</p> <p>Eliminates need for staff assistance</p> <p>Is relatively inexpensive, may cost from \$100. to \$200.</p> <p>Is a reversible solution</p>	<p>Changes historic appearance</p> <p>Is not practical if a step is adjacent to threshold</p>
Install a new <u>beveled threshold</u>	<p>Is a permanent solution</p> <p>Eliminates need for staff assistance</p> <p>Is relatively inexpensive, may cost \$400</p>	<p>Changes historic appearance</p> <p>May not be reversible</p>

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
2. ACCESS TO THE MAIN FLOOR		
The purpose of entering a historic structure is to enjoy whatever is inside. Several elements of the main floor may be a barrier or a hazard to handicapped visitors. They include interior doors, thresholds, floor surface, and paths of travel.		
A. <u>Interior Doors and Doorways</u> : See <u>Doors</u> and <u>Doorways</u> , Page 36 .		
Remove door	Is reversable Can be implemented quickly Is inexpensive	May affect historic appearance Increases clear opening by thickness of door only
B. <u>Interior Thresholds</u> : See <u>Thresholds</u> , Page 37 .		
Place <u>carpeting</u> over beveled threshold	Protects threshold	Door may not close properly Carpeting will wear out more rapidly
C. <u>Path of Travel</u>		
PROBLEM: <u>Obstacles</u> that protrude or hang down into a path of travel may be hazardous to blind visitors and those in wheelchairs.		
Remove obstacles	Allows independent access	May change historic appearance and/or destroy fabric May affect interpretive program
For hanging or wall mounted obstacles, place an object on the floor below the obstacle to warn blind visitors	May minimize hazard for blind visitors Allows independent access	May cause further obstacle for other visitors
Place an audible flasher where objects protrude or hang down	Is a permanent solution Eliminates need for staff assistance	Requires that visitors be aware of flasher's meaning
D. <u>Floors</u>		
PROBLEM: <u>Slippery floors</u> are a hazard to visitors who walk with instability.		
Apply <u>non-slip finish</u> to floors, where possible	May not affect appearance of floor Is relatively inexpensive May be reversible	May be ineffective

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
Carpet floors with high density, low pile carpeting without padding	<ul style="list-style-type: none"> Is a permanent solution Eliminates wear to original flooring Is relatively inexpensive Is a reversible solution 	<ul style="list-style-type: none"> Is a modern addition
Place non-slip runners in Path of Travel	<ul style="list-style-type: none"> Is a permanent solution Eliminates wear to original flooring Is less expensive May allow original flooring to be seen Is a reversible solution 	<ul style="list-style-type: none"> Is a modern addition

PROBLEM: Thick carpeting (any carpeting that is made of thick pile) causes difficult travel for visitors in wheelchairs.

Remove padding	<ul style="list-style-type: none"> May be a permanent solution Eliminates staff assistance Requires only labor cost Is a reversible solution 	<ul style="list-style-type: none"> May make carpet wear out Carpet may still cause difficulty
Install <u>new carpeting</u> with thin padding	<ul style="list-style-type: none"> Is a permanent solution Eliminates staff assistance Is a reversible solution 	<ul style="list-style-type: none"> May be expensive

PROBLEM: Unanchored Carpeting: is a hazard for those with visual impairments or individuals who walk with instability.

Anchor carpeting to floor	<ul style="list-style-type: none"> Is a permanent solution Is inexpensive Eliminates staff assistance 	<ul style="list-style-type: none"> Will leave holes in historic flooring Is not a reversible solution
Remove carpeting	<ul style="list-style-type: none"> Is a permanent solution Requires only labor cost Eliminates need for staff assistance Is a reversible solution 	
Use corner non-slip pads	<ul style="list-style-type: none"> Is inexpensive Eliminates staff assistance 	<ul style="list-style-type: none"> May not be a permanent solution

TYPICAL SOLUTIONS

ADVANTAGES

DISADVANTAGES

2. ACCESS TO THE MAIN FLOOR

E. Changes in level: See Steps, Page 32 .

F. Illumination

PROBLEM: Low lighting (any part of the floor that has low illumination) may be a hazard to those with visual impairments.

Increase present light levels

Allows independent access
Is a reversible solution

May change historic atmosphere

Increases use of energy

3. ACCESS TO TOILET FACILITIES

It is rare that historic buildings allow public use of historic toilets. More likely, an historic site provides toilet facilities and other conveniences in a nearby visitors center or in a less historic building. In this case, the toilet rooms should be remodeled to comply with current standards of accessibility. If public toilet rooms are located in historic buildings they are usually inaccessible to those in wheelchairs. Inaccessibility to those in wheelchairs may be due to any combination of the following problems. A specialist should evaluate each toilet room to determine the extent to which these typical problems apply.

A. Vestibule or Privacy Area at Entrance

PROBLEM: Small vestibule or privacy area at the entrance may not allow those in wheelchairs to maneuver and pass through to the main room.

Remove inner privacy door or shorten privacy panel

Allows independent access
Is relatively inexpensive
May be reversible

Could change appearance of historic toilet
Might affect privacy

B. Main Toilet Room

PROBLEM: Restrictive clear space within the room may not allow wheelchairs to maneuver.

Enlarge toilet room into adjacent area

Allows independent access

May involve destruction of historic fabric in toilet room and/or adjacent areas

May not be structurally possible

Is expensive - from \$4,000 to \$8,000

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
C. Toilet Stall		
PROBLEM: <u>Narrow stall door</u> may not permit a wheelchair to enter.		
Remove <u>stall door</u> and <u>front panels</u> adjacent to door, and install wider door or curtain	Allows independent access to stall	Is only as effective as width of stall structure
PROBLEM: <u>Small toilet stall</u> (one that is too narrow to permit lateral transfer from wheelchair to toilet seat or too small to allow wheelchair to maneuver) may be a barrier.		
Make two adjacent stalls into a <u>large stall</u> by removing one water closet, and installing new partitions with a wide door	Allows independent access Provides space for attendant care if needed	Reduces plumbing fixture count (may violate code requirements) Changes appearance of toilet room May affect historic features May be expensive if remaining water closet must be moved. From \$600. to \$1,200
Remove partition between two <u>toilet stalls</u> and install privacy curtain. (temporary solution)	Allows use of two toilets Is reversible Allows independent access Is a permanent solution	Provides less privacy Curtain may be soiled, ripped, etc May be considered unacceptable
Make <u>single stall</u> larger	Allows independent access Is a permanent solution	May make area outside of stall too small May require movement of adjacent fixtures

D. Grab Bars		
PROBLEM: <u>Absence of grab bars</u> makes it very difficult for those in wheelchairs to transfer to the lavatory.		
TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
Install <u>grab bars</u> on rear wall and nearest side wall	Provides support within reach from toilet seat Allows for independent movement Is permanent solution May be reversible	Anchor holes for grab bars may affect historic fabric

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
E. Lavatory		
PROBLEM: <u>Insufficient clear opening underneath</u> (lavatories that have less than 29" clear opening under front) will not permit an individual in a wheelchair direct access to fixtures.		
Remove <u>lavatory</u> with legs or deep apron and install proper wall hung lavatory	Allows independent access Increases space for wheelchairs to maneuver	May change historic appearance May damage historic fabric May be difficult to patch floor and wall so as to match existing materials
F. Urinals		
PROBLEM: <u>High urinals</u> are difficult or impossible to use by men in wheelchairs.		
Remove existing <u>urinal</u> and replace with lower wall-mounted urinal (17" high at rim of urinal)	Allows independent access	May affect historic fabric
G. Mirrors and Dispensers		
PROBLEM: <u>High mirrors and dispensers</u> are difficult or unusable by those in wheelchairs.		
Lower existing <u>mirrors</u> and <u>dispensers</u>	Is permanent solution	May expose bolt holes and require patching May damage historic fabric
Install <u>tilt mirror</u> or additional mirror and dispensers adjacent to existing ones	Does not affect original mirror and dispenser Is a permanent solution	Requires space for additional mirror and dispensers Introduces modern features
H. GENERAL PROBLEM: <u>Inaccessible public toilet rooms for men and women</u> are not usable by visitors in wheelchairs.		
Modify one <u>toilet room</u> , install thumb-turn lock	Minimizes intrusion and damage to historic fabric	Restricts use by public May violate local codes
Modify one <u>staff toilet</u> , install thumb-turn lock and mark it for private use by either sex	Further minimizes intrusion and damage to historic fabric	Segregates handicapped visitors

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
4. <u>ACCESS TO THE SITE</u>		
All paths of travel at an historic site, especially those that lead to historic structures, ought to be accessible to handicapped visitors. Priority should be given to the path most used by visitors.		
A. <u>Paths</u>		
PROBLEM: <u>Narrow path</u> (less than 32 inches wide) may be a barrier to visitors in wheelchairs and visitors using crutches.		

Widen path of travel

Is a permanent solution
Eliminates need for staff assistance
Can be made to look like original path

May affect historic appearance of site
May be very expensive, costing \$2.00 to \$4.00 per square foot
May not be a reversible solution

PROBLEM: Improperly Paved Path (not paved with smooth, non-slip material) may be a barrier or a hazard to visitors in wheelchairs, and visitors with mobility and visual impairments.

Pave path with a smooth non-slip surface

Is a permanent solution
Eliminates need for staff assistance

May affect historic appearance
May be very expensive, costing \$1.00 per square foot
Is not a reversible solution

PROBLEM: Steep paths are a barrier to visitors in wheelchairs and a hazard to those with mobility and visual impairments.

Regrade Path to slope 1 in 20

Is a permanent solution
Eliminates need for staff assistance

May affect historic appearance of site
Requires a considerable lengthening of a path: to overcome a rise of 12 inches a 20 foot path is necessary
Is not a reversible solution
Is a very expensive solution

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
Regrade <u>path</u> to slope 1 in 12 with handrails and level areas every 30 feet	Is a permanent solution Eliminates need for staff assistance	May affect historic appearance of site Path becomes a ramp and must be properly railed May be impossible to ramp a very steep path Is a very expensive solution. Requires a considerable lengthening of a path: to overcome a rise of 12 inches a 12 foot path is necessary Is not a reversible solution

PROBLEM: Long paths may tire visitors in wheelchairs and others with mobility impairments.

Install <u>benches</u> (with arms and backs) every 250 feet	Eliminates the need for staff assistance Is relatively inexpensive	May be a visual intrusion
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B. Steps - See Steps, Page 32 .

GENERAL PROBLEM: Inaccessible walks are a barrier for visitors in wheelchairs.

Provide a golf cart with lift to transport a visitor in wheelchair	Minimizes intrusion and damage to historic fabric May be used to provide access to and from parking	May require staff assistance
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TYPICAL SOLUTIONS

ADVANTAGES

DISADVANTAGES

5. ACCESS TO OTHER FLOORS

Most historic structures have other floors that are open to the public. After making a first floor accessible, the next priority is to make the second (or other) floor accessible.

In most cases, a stairway is the only means of going from floor to floor. Unless there is an elevator or there is room to build an elevator, there are seldom real options for getting a visitor in a wheelchair from one floor to another.

Historic stairways also pose problems for visitors with mobility and visual impairments. In many cases there are solutions to some problems that will give access to many, if not all, visitors with mobility and visual impairments.

A. Railings

PROBLEM: One railing (a stairway with a railing on one side) is a barrier to visitors with weakness or paralysis on one side of their bodies.

Install another railing

Is a permanent solution for many visitors

May cause visual intrusion

Is relatively inexpensive. May cost from \$900. to \$1,000.

May damage historic fabric

May eliminate need for staff assistance

Is a reversible solution

PROBLEM: Low railing (a stairway with a low railing) is a barrier or a hazard to visitors with upper extremity and mobility impairments.

Install a new upper railing

Is a permanent solution

Is a visual intrusion

Eliminates need for staff assistance

May involve damage to historic fabric

Is expensive, may cost from \$1,600 to \$2,000

May be non-reversible

PROBLEM: Wide railing may be a barrier to persons with manual impairments.

Install a new railing

See page 35

Install a narrow railing piece over existing railing

Is a permanent solution

Is a visual intrusion

Eliminates need for staff assistance

May involve damage to historic fabric

Is relatively inexpensive, May cost from \$20. per linear foot

May be an irreversible solution

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
B. <u>Stairways</u>		
PROBLEM: <u>Projecting Nosings</u> (steps where the tread extends beyond the riser) are a barrier or a hazard to visitors with mobility and visual impairments.		
<u>Install wood boards over riser</u>	<ul style="list-style-type: none"> Is a permanent solution Eliminates need for staff assistance Is a reversible solution 	<ul style="list-style-type: none"> May be a visual intrusion Is relatively expensive, may cost \$65.00 per step
<u>Carpet steps</u>	<ul style="list-style-type: none"> Is a permanent solution Eliminates need for staff assistance Is inexpensive, may cost from \$2.00 per square foot Is a reversible solution 	<ul style="list-style-type: none"> May be a visual intrusion
PROBLEM: <u>Open risers</u> are a hazard to visitors with mobility and visual impairments.		
<u>Install solid risers</u>	<ul style="list-style-type: none"> Is a permanent solution Eliminates need for staff assistance 	<ul style="list-style-type: none"> May cause damage to historic fabric May be a visual intrusion Is expensive, may cost from \$65.00 per step Is not a reversible solution
PROBLEM: <u>Uneven treads</u> are a hazard to visitors with mobility and visual impairments.		
<u>Carpet risers</u>	<ul style="list-style-type: none"> Is a permanent solution Eliminates need for staff assistance Is relatively inexpensive, may cost from \$2.00 per square foot 	<ul style="list-style-type: none"> May be a visual intrusion

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
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C. GENERAL PROBLEM: Stairways are inaccessible to visitors in wheelchairs.

Install a <u>chair lift</u>	Provides access for those who can sit on lift Is a reversible solution	May affect flow of visitor traffic up and down stairs May damage historic fabric Is a visual intrusion
Install a <u>Residential Elevator</u>	Provides independent access for those in wheelchairs Is permanent	May not be structurally possible Requires alteration of building which may affect historic fabric Is not reversible Requires maintenance
Install a <u>commercial elevator</u>	Provides access for many visitors Conforms with standards	May be structurally impossible Requires alteration of building which may affect historic fabric Requires sufficient space to install shaft 10' by 10' Is expensive, may cost from \$40,000 to \$88,000

6. ACCESS TO PARKING

Most visitors come to an historic site by car. Therefore, it is important for visitors, especially certain handicapped visitors, to park in a nearby, accessible parking area. It is unlikely that a parking area has any historical significance, therefore, it should be made to comply with present standards.

Parking areas should have wide spaces reserved for handicapped visitors. These spaces should be closest to the parking area exit; should be identified with the International Symbol of Accessibility; and should have directions leading to them. In addition, the parking area should be paved with smooth, non-slip material; and be free of curbs or steps in the path of travel.

PROBLEM: Narrow spaces do not permit individuals in wheelchairs or with braces to get in and out of vehicles.

Convert four 9 foot <u>spaces</u> into three 12 foot wide spaces.	Does not affect other parking spaces. No need to repaint all lines	Reduces number of spaces in lot by one
Locate special parking spaces adjacent to walk or other smooth, stabilized level area and use this area for disembarking and entry	Does not affect number and size of existing parking spaces.	May require a curb ramp if walk has curb

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
PROBLEM: <u>Steps or Curbs</u> : See <u>Steps</u> , Page 32 .		
PROBLEM: <u>Loose, rough and uneven areas</u> : See <u>Improperly Paved Path</u> , page 43 .		
Reserve a proper <u>parking space</u> at or near the site for use by handicapped visitors, i.e., next to building or in street	Reduces travel distance from parking area to building	May be a visual intrusion May require approval by city or town May not be sufficient if visitation is high
7. ACCESS TO DRINKING FOUNTAINS		
Most drinking fountains are modern conveniences. Their location in a historic part of the site, however, may cause some problems if they are moved.		
PROBLEM: <u>High drinking fountains</u> do not permit use by visitors in wheelchairs.		
Remove and replace with <u>drinking fountain</u> designed for use by wheelchair	Everyone can use wheelchair drinking fountain Blind people will benefit from recessed fountain	Expense of removing serviceable drinking fountain to purchase new, more costly one
Install <u>fountain</u> at lavatory in accessible toilet room	Does not affect existing fountain or surrounding area Is less expensive than installing another water fountain	May segregate handicapped individuals Is less pleasurable in toilet room Is less likely to be used if not located near regular fountain
Install cup dispenser beside Inaccessible <u>Fountain</u>	Immediate solution	People often carry and spill water, drop cups on floor; dispenser is often empty
Add proper wheelchair <u>drinking fountain</u> adjacent to and plumbed into existing fountain	Does not disturb original fountain or uncover holes to be patched May be less expensive than lowering existing fountain	Takes up more space Is another modern feature
PROBLEM: <u>Improper drinking fountain controls</u> are difficult or impossible to operate by those with manual impairments.		
Change Button <u>Controls</u> to lever handles on both sides	Easier for everyone to use	None

TYPICAL SOLUTIONS	ADVANTAGES	DISADVANTAGES
8. <u>ACCESS TO PUBLIC TELEPHONES</u>		
PROBLEM: <u>High telephones</u> (typical height) are unusable by visitors in wheelchairs.		
PROBLEM: <u>No amplifying device</u> (a telephone without an amplifying device) may be unusable by visitors with hearing impairments.		

Public telephones are owned and operated by the Telephone Company and can only be modified by them. Upon request, and for a service charge, they will lower the height of any phone on private property and will install the induction coil to augment hearing aids

Low cost

None

Case Studies

INTRODUCTION

This chapter contains five case studies which illustrate how the information contained in the other chapters of this Technical Manual can be applied to actual situations. The historic structures chosen for the case studies exemplify some of the priority problem areas discussed in Chapter 5. The case studies are as follows:

Case Study No. 1: Custom House addresses the problem of access to the building. The entire structure is discussed, but the main focus is on the inaccessibility of the structure to people in wheelchairs.

Case Study No. 2: Bishop White House also addresses the problem of access to the building, although the availability of an alternate entrance which could be made accessible changes the proposed solution considerably.

Case Study No. 3: Derby House shows how administrative accommodation can be used creatively to overcome a problem of access to the main floor.

Case Study No. 4: Arlington House discusses the use of devices to assist handicapped visitors in gaining access to and around the site.

Case Study No. 5: Vanderbilt Mansion discusses how major modification of an elevator might be undertaken to allow visitors in wheelchairs access to other floors.

These cases are examples; the recommended solutions do not necessarily imply approval by the National Park Service.

CASE STUDY NO. 1: CUSTOM HOUSE, SALEM MARITIME N.H.S.ACCESS TO THE ENTRANCEI. INTRODUCTION

This building was chosen to represent an early type of federal building with the typical architectural barriers of that day: an impressive building on a pedestal of twelve granite steps, serving as the headquarters and visitors center for five buildings and two wharves on a total of nine acres; it is the only national historic site which represents the history of 18th and early 19th century American shipping.

Located on Salem's Waterfront, this site includes examples of early American port and wharf facilities. Fifty Thousand visitors visit the Custom House each year; and five times that number visit other parts of the site: the Bonded Warehouse, Central Wharf, Derby Wharf, Derby House and the West India Goods Store.

Every year, hundreds of major shopping vessels sailed into Salem Harbor. These Ships' cargoes were taxed or held in storage until taxes could be paid or goods sold, exported, or auctioned.

The Custom House presents a particular accommodation challenge because of its inaccessibility to those in wheelchairs and difficult access for those with mobility limitations. The twelve granite steps at the only visitor entrance make ramps unfeasible and alternate side entrances have narrow steep stairways. Because the Bonded Warehouse building is adjacent to the rear of the Custom House, no access to the Custom House is provided at the rear.

II. CLASSIFICATION OF THE SITE

The Custom House is classified as follows:

SIGNIFICANCE: national, the only one of its kind representing American ships.

REASON FOR SIGNIFICANCE: The Custom House is one historic structure within the Salem Maritime National Historic Site. Salem is an example of early New England shipping, an industry which played an important role in the economic development of the new United States.

TREATMENT: preservation

USE OR FUNCTION: restored historic structure, visitor center, and offices

SECTOR: public

YEARLY VISITATION: 55,000

LOCATION: urban

STAFFING: At least 1 full-time staff member

III. ACCOMMODATION PROBLEMS IDENTIFIED

A survey of the building and its immediate site using the checklist, revealed the following accommodation problems:

Parking Lot:

There is a new parking lot with approximately 40 spaces. It is located about 300 feet from the Custom House. The parking lot:

- has no reserved spaces for handicapped visitors
- is not paved
- has no directional signs to the Custom House
- has no way to request assistance from Custom House staff.

Walks:

The sidewalk leading to the Custom House from the parking lot is brick. There are no curb cuts. All parking (parking lot and street parking) is across the street from the Custom House. (The sidewalk and street are not federal property.)

Ramps:

None.

Entrances/Exits:

The Custom House is set back from the street. There is a brick apron with one step surrounding the structure.

The main public entrance has twelve granite steps leading to the front door. There is no way to overcome these steps for a person in a wheelchair.

The main entrance steps are railed on both sides. The railing is elaborately designed cast iron. The railing is lower than present standards allow.

There is an additional step at entrance door. There is no way to request assistance from a staff person if a visitor cannot get up the stairs.

There is a side entrance with twelve granit steps. There is a basement entrance with no way to get from the basement to the first floor.

Doors and Doorways:

There are two-leaf doors at the entrance. Each door is narrower than the standard wheelchair.

The doors have thumb latch hardware.

The door requires more than 15 pounds of effort to open with a single effort.

All doorways have high thresholds.

Stairs and Steps:

The stairway has one (discontinuous) railing that is too low and too wide for many mobility impaired visitors.

Floors:

Wooden floors are slippery when polished.

Public Toilet Rooms:

Public toilets are in a separate wooden structure in the yard behind the Custom House. The toilets are not accessible to persons in wheelchairs. There are no directional signs to these toilets.

Drinking Fountains:

There is no drinking fountain.

Public Telephones:

There is no public telephone.

Elevators:

There is no elevator.

Controls:

Visitors do not use controls.

Warning Signals:

There are no warning signals.

Hazards:

There are no hazards.

IV. MAJOR PROBLEM IDENTIFIED

All three entrances (front, and two sides) are inaccessible to visitors in wheelchairs because each entrance has twelve steps leading to the first floor.

V. PROPOSED SOLUTIONS

After careful evaluation of the problem of entrance to the building, the following alternate solutions were analyzed:

1. A Vertical Wheelchair Lift at the Left Side Entrance

A lift could be placed at the left side entrance. However, installing a lift would require the removal of a portion of the cast-iron railing that surrounds the top of the steps.

2. An Inclined Wheelchair Lift at the Left Side Entrance

An inclined lift could be installed over the left side steps. However, this would require removing a section of the brick apron and installing a metal plate. Holes would have to be drilled into the granite steps in order to stabilize the cograil. In addition, the step at the door would have to be ramped.

3. Cut Through the Brick Common Wall Between the Custom House and the Bonded Warehouse

This option would require that a ramp be installed to overcome the three steps leading into the Bonded Warehouse.

4. Alternate Accommodation

There are a number of options within this option.

Option A: Exhibit

Create an exhibit in a street level window or at a separate location.

Option B:

Create an audio presentation and locate it on the side of the Custom House. The audio presentation and/or the exhibit would inform visitors about the Custom House even when it was not open.

Option C: Show a film (slide show, videotape) in the nearby Derby House

The Derby House has a rear entrance that is accessible to all visitors. There is a large room just inside the entrance that would be suitable for presenting a film (etc.) about the Custom House.

Option D: Staff Briefing

If there were a buzzer outside the Custom House, a person in a wheelchair could call for a staff person to come and interpret the structure. A picture album could be created that would show the interior of the Custom House.

VI. OTHER PROBLEMS DISCUSSED

These problems are listed in the order in which they appeared on the checklist used to assess the Custom House.

1. The parking area has no reserved spaces for handicapped visitors.
Spaces should be reserved in the parking area or the Town of Salem should be asked to reserve spaces in the street across from the Custom House.
2. The parking area has a pebblestone surface which is uneven and causes problems for mobility impaired persons.
The parking area or a path should be paved to benefit those visitors who walk with difficulty.
3. There are sidewalks with no curb cuts for persons in wheelchairs.
The Town of Salem should be asked to make curb cuts for wheelchairs. Curb cuts should be provided on both sides of the street in front of the Custom House.
4. The stone apron in front of the Custom House contains a step that causes difficulty for mobility impaired individuals.
The stone slabs that form the apron can be tilted to create a natural ramp which will allow persons in wheelchairs and those who walk with difficulty to move about the area in front of the building.
5. The entrance has twelve steps leading to the front door.
See IV: Major Problem Identified.
6. An additional step at the front door presents problems for those with mobility impairments.
If access is provided up the front steps for those in wheelchairs then a ramp should be provided at this front door step. The ramp could be temporary. If access is not provided for those in wheelchairs, then staff can assist those who walk with insecurity up this step.
7. The doors are a pair, each one narrower than current standards permit for a person with crutches.
When both doors are opened, there is enough room for a person using crutches to get through. Staff should assist by opening the two doors.
8. The door has a closer that requires more than 15 pounds of effort to open and makes the door close too quickly for mobility impaired visitors.
The door may open with less pressure and close less quickly if the closer were oiled and adjusted.

9. The door has a thumb latch handle which is difficult to open for many mobility impaired visitors.
The hardware is not the original hardware. The present hardware could be replaced with a lever latch handle.
10. Interior doorway thresholds are too high for many mobility and visually impaired visitors.
The thresholds could be bevelled or a staff member could assist a mobility or visually impaired visitor over the threshold.
11. The stairway to the second floor is steep, and has one low discontinuous railing which is a hazard for many mobility and visually impaired visitors.
The second floor of the Custom House has limited visitor exhibits. Modification of the stairway is not necessary. Staff members could help a mobility or visually impaired person up the stairs or photographs of the upstairs rooms could be shown on the first floor.
12. The wood floors are slippery when freshly polished.
The floors could be polished in a flat or non-slip finish or an anchored runner could be placed in the path of travel.
13. The public toilets are not accessible to visitors in wheelchairs.
The public toilets should be remodeled to accommodate visitors in wheelchairs. A sign should be posted and Park pamphlets should identify and locate such accessible facilities.
14. There is no drinking fountain.
An accessible drinking fountain should be installed near the public toilet.
15. The Custom House is not clearly marked.
The original lettering: "CUSTOM HOUSE" is located high on the facade of the building. The location of the Custom House and its use as a visitor center should be identified by a sign at the parking area. An additional sign in the front of the Custom House at street level may be necessary.

VI. ANALYSIS OF PROBLEMS

To illustrate the process of decision-making as discussed in Chapter 4, a sample accommodation worksheet is included next. The worksheet has been filled in to evaluate the major problem at this structure; all entrances (front, and two sides) are inaccessible to visitors in wheelchairs because each entrance has twelve steps leading to the first floor. The specialist should use this format for evaluating other priority problems which involve the comparison of several alternative solutions.

ACCOMMODATION WORKSHEET

HISTORIC SITE: CUSTOM HOUSE, SALEM MARITIME N.H.S.ACCOMMODATION PROBLEM: All entrances are inaccessible to visitors in wheelchairs.

EVALUATOR _____ DATE _____

PROPOSED SOLUTIONS	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
	Vertical wheelchair lift at left side entrance.	Inclined wheelchair lift at left side entrance.	Entrance to Custom House through contiguous Bonded Warehouse.	Alternate accommodation
ACCOMMODATION BENEFIT	Access to first floor. Can benefit other mobility impaired. Side entrance involves some segregation. ⊕	Same as No. 1 ⊕	Access to first floor. Entrance for handicapped would be segregated ⊕	Does not provide physical access. May segregate unless used for all. ⊕
EFFECT ON HISTORIC FABRIC	Requires removal of part of railing. Some visual intrusion. Permanent. ⊕	Involves drilling holes in steps. Permanent change to steps. ⊖	Permanent change that destroys historic fabric. Irreversible. Less conspicuous. ⊖	None ⊕
COST	4,000 - 5,000 ⊕	5,000 - 9,000 ⊕	8,000 ⊖	Varies ⊕
TIME	1 week ⊕	1 week ⊕	1 month ⊖	1 month ⊖
IMPACT ON NPS STAFF	Staff must operate lift and bring out portable ramp. ⊖	Same as No. 1 ⊖	Staff must open door and bring out portable ramp. ⊕	Staff need to be present. ⊖
SAFETY	Reasonably safe ⊕	Same as No. 1 ⊕	Fire exit problem is possible. ⊖	N/A ○
OTHER	Periodic maintenance. Vandalism possible. ⊖	Same as No. 1 ⊖	Slight ⊖	N/A ○
SUMMARY	Provides physical access with some intrusion.	Provides physical access with some intrusion and damage to steps.	Alteration involves damage to historic fabric. Segregate handicapped somewhat.	Interpretive alternative to physical access. May segregate unless given to all visitors.
RECOMMENDATION	Preferred physical access solution.	May be less desirable than vertical lift.	Least desirable physical solution.	Interpretive alternative to physical access. - interim solution.

VII. DISCUSSION AND CONCLUSIONS

The Custom House exemplifies a historic building which presents serious difficulties in accommodating visitors in wheelchairs. The many granite steps at the main entrance limit the options for accessibility considerably. While a mechanical device was considered to take visitors up these steps, the creation of a new back entrance was discussed, and the installation of an elevator was considered. It seemed that a combination of alternate accommodations provided the most feasible solution. By upgrading visitor interpretation efforts to include pictures or models of the interior of the Custom House, and by modifying an existing audio-visual program to portray the site, it was felt those with total mobility impairments could reasonably experience the cultural resource.

A ground level exhibit depicting the inside of the building was proposed which would provide enjoyment for all those who passed by, even when the building was closed. The exhibit could be placed in a ground level window, on an existing sign board or at a separate location. Care should be taken so that the exhibit does not intrude on the historic scene. Alternatively, an audio presentation could be located at ground level.

Alternate accommodation was tentatively recommended with the knowledge that two Wharfs and another building on the site offered considerably better accessibility for those in wheelchairs and the building is one part of a nine acre site.

As for visitors with other disabilities, this case study demonstrates how some changes in the interpretation program, minor physical modifications, plus staff assistance can significantly upgrade accommodation for the handicapped. Many such changes could be accomplished at modest cost and in a reasonable time frame.

Implementation of certain changes will require careful study by site staff, the Regional Historic Architect, Regional Interpreter, and possibly staff from the Denver Service Center and Harpers Ferry Center. In many cases, certain accommodations can be made immediately by staff maintenance personnel. In other cases, such as the alteration of the public toilet facilities located behind the building, this will be a lengthy and costly project. Once again, it is important to underscore the need for interim accommodation while certain difficult changes are being made. Accessible toilet facilities should thus be found nearby and visitors in wheelchairs directed to them.

CASE STUDY NO. 2: BISHOP WHITE HOUSE, PHILADELPHIAACCESS TO THE ENTRANCEI. INTRODUCTION

The Bishop White House, built in 1786-87, typifies a gracious private home in an urban setting. This row house was inhabited by Bishop William White, rector of Christ Church and St. Peter's Church, and the first Episcopal Bishop of Pennsylvania.

The house presents a particular challenge because the front entrance is at the city sidewalk. Because the Park Service does not own the city sidewalk, and because it must continue to be used for pedestrian traffic, options for gaining entry to the main entrance in wheelchairs are limited. The main entrance has two stone steps and a third at the threshold. There are no railings at the front entrance.

At present there is only one alternate entrance, at the side of the building in the garden (see sketch page 63). The garden entrance can be reached by going through a 34 1/2" wide door in the garden wall at the front and travelling along a wide brick walk. This entrance has two steps with a third at the threshold, totalling 18" in height. The door at this entrance is 36 1/2 inches wide.

At present, the side entrance is not used except for entry by handicapped visitors as needed. A portable metal ramp 83" long and 43" wide is located in the garden and is placed over the steps and threshold. The side door must be open for the ramp to be in place. Visitors in wheelchairs are pushed up the ramp, presumably by Park Service staff or volunteers.

A back delivery entrance does not allow direct access to the rest of the building.

It is important to note that the Bishop White House is open by appointment only. Visitors must obtain a free ticket at the Independence National Historical Park Visitor Center and join a guided tour conducted by a staff person or volunteer.

II. CLASSIFICATION OF THE SITE

The Bishop White House is classified as follows:

SIGNIFICANCE: national

REASON FOR SIGNIFICANCE: As part of the Independence National Historic Park, this house represents the colonial dwelling place of an important person.

TREATMENT: preservation

USE OR FUNCTION: house museum

SECTOR: public

YEARLY VISITATION: 8,000

LOCATION: urban

STAFFING: 1 staff person, 1 volunteer

III. ACCOMMODATION PROBLEMS IDENTIFIED

A survey of the site using the Survey Checklist revealed the following problems, related to entrances:

- The front entrance is inaccessible to visitors in wheelchairs. Access to a side entrance is provided by a portable ramp and staff assistance.
- All entrances lack railings for those who walk with instability.

IV. PROPOSED SOLUTIONS

Careful analysis of the problems revealed the following possible alternate solutions:

Stairs:

1. Provide a portable wheelchair ramp at front entrance as needed.
2. Use existing portable metal ramp at side entrance.
3. Install metal or wooden ramp at the side entrance.
4. Install a vertical lift at the side entrance.

Railings:

1. Install a free standing railing at the front entrance.
2. Install free standing newel posts on either side of front entrance.
3. Provide staff assistance at front steps for those who walk with instability.

ACCOMMODATION WORKSHEET

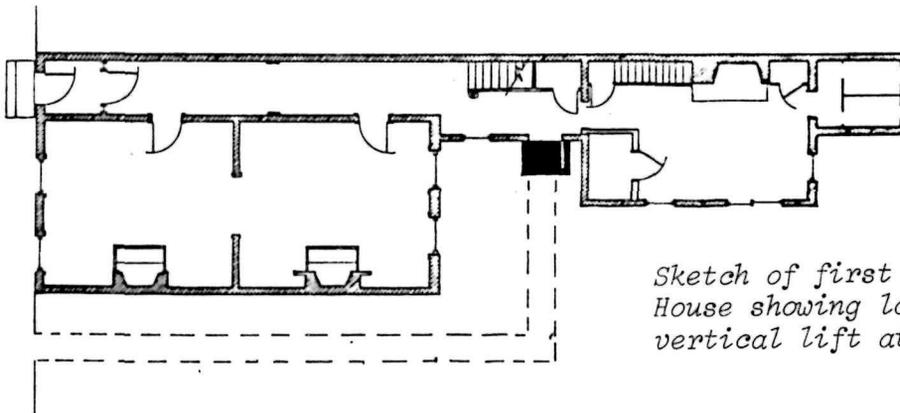
HISTORIC SITE: BISHOP WHITE HOUSEACCOMMODATION PROBLEM: All entrances are inaccessible to visitors in wheelchairs.

EVALUATOR _____ DATE _____

PROPOSED SOLUTIONS	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
	Portable wheelchair ramp at front entrance.	Use existing metal ramp at side entrance.	Permanent ramp at side entrance.	Vertical lift at side entrance.
ACCOMMODATION BENEFIT	Broad benefit. Depends on slope of ramp. Most integrated: uses main entrance. Has no railings. ⊕	Slope of ramp is steep (1 in 5). Has no railings. ⊕	Independent access. Conforms with standards. Not integrated unless all visitors use this entrance. ⊕	Conforms with standards. Not integrated unless all visitors use side entrance. Has railings. ⊕
EFFECT ON HISTORIC FABRIC	Temporary intrusion on front of building. Reversible. ⊖	Less intrusion at side entrance. Reversible. ⊖	Can be reversible. Less intrusion at side entrance. Permanent modern addition. ⊕	Less space than permanent ramp - less intrusion can be reversible. Requires platform over steps. ⊕
COST	500 ⊕	No additional. ⊕	3,800 ⊖	4,000 ⊖
TIME	1 day ⊕	None ⊕	1 week ⊕	1 week ⊕
IMPACT ON NPS STAFF	Requires staff to move before and after use and to assist visitors. ⊖	Staff must assist visitors up ramp. ⊖	No staff assistance except to open doors. ⊕	Staff assistance to operate lift and open doors. ⊕
SAFETY	No railings. Ramp may be steep. ⊖	No railings. Ramp is steep. ⊖	Very safe. ⊕	Reasonably safe. ⊕
OTHER	May be a hazard to public who use sidewalk. ⊖	No maintenance. ⊖	No maintenance. ⊕	Risk of mechanical failure. Maintenance Slight vandalism. ⊕
SUMMARY	Unnecessary intrusion and temporary hazard.	Low intrusion. Staff must push visitors up steep ramp.	Some intrusion. Independent access.	Good access with minimum visual intrusion.
RECOMMENDATION	Least desirable.	Interim solution.	Good solution.	Preferred solution.

IV. DISCUSSION AND CONCLUSIONS

Analysis of the solutions to the entrance problem indicates that option #4: Install a vertical lift at the side entrance, provides favorable access. This entrance is reasonably accessible through the garden, and because the garden is walled, installation of a lift would not be a visual intrusion to visitors at the front. It is important to note that a lift requires that a 5 foot by 5 foot platform be built over the existing stairs. This could be designed to be reversible and not damage the stairs. The lift would then raise individuals in wheelchairs up to the platform so they could roll through the doorway.



Sketch of first floor of Bishop White House showing location of proposed vertical lift at side entrance.

A ramp at this side entrance was considered to be less desirable because of its length; 18 inches of rise requires 18 feet of length. Because the garden wall is not much more than 18 feet from the doorway, the ramp would have to bend at a right angle and extend along the garden walk in either direction.

The existing portable ramp at the garden entrance, while able to be moved and used as needed, is steep (more than 1 in 5 as opposed to the ANSI standard of 1 in 12 for ramps) and requires that staff push visitors up this incline. Such a steep ramp may be dangerous for the visitor in the wheelchair; there are no railings, and only a small curb at each side prevents wheelchairs from slipping off. When faced with a heavy person in a wheelchair, such pushing may be dangerous or very difficult for a staff person.

A portable ramp at the front entrance would be similar to the one at the side entrance. If longer to reduce the slope, it would be heavier and more difficult to move from its storage space to the front steps. It would also restrict the use of the sidewalk at the front and present a visual intrusion while in place. Considering the existence of a side entrance, any portable ramp would be better placed there.

Whether or not a railing is installed at the front door depends on the availability of staff and their ability to assist all visitors. The fact that the house is open by appointment only and that the tours are guided suggests that staff would be available.

A free standing newel post at the front entrance would also intrude on the historic appearance, but perhaps slightly less so. It would likely provide less support for those who must lean on something or grasp something nearly horizontal.

The fact that the steps are not steep and the columns at either side of the steps may be used for partial support suggests that further study be made into the need for such modern additions.

This case illustrates the use of an alternate entrance to preserve the historic appearance of the front entrance. The sidewalk entrance feature of Philadelphia row houses is unusual and should be respected. At the same time, a modern addition such as a lift can be added at an alternate entrance since it is not visible from the street and the entrance is not normally used by the public.

CASE STUDY NO. 3: DERBY HOUSE, SALEM MARITIME N.H.S.ACCESS TO THE MAIN FLOORI. INTRODUCTION

The Derby House, now the oldest brick dwelling in Salem, Massachusetts, was erected in 1761-62 by Captain Richard Derby. His son Elias Hasket Derby lived in this house until after the revolution.

The house is a fine example of an 18th century colonial home, complete with narrow center hallway. It is this hallway with its even more narrow doorway that is both a historic feature and a barrier for visitors in wheelchairs.

II. CLASSIFICATION OF THE SITE

The Derby House is classified as follows:

SIGNIFICANCE:	national
REASON FOR SIGNIFICANCE:	The Derby House is one historic structure within the Salem Maritime National Historic Site. Salem is an example of early New England shipping, an industry which played an important role in the economic development of the new United States.
TREATMENT:	preservation
USE OR FUNCTION:	restored historic structure, guided tours only
YEARLY VISITATION:	3,000 or less
LOCATION:	urban
STAFFING:	1 interpreter (1/2 time) at any one time.

III. ACCOMMODATION PROBLEM IDENTIFIED

A survey of the site using the Survey Checklist revealed the following problem related to access to the main floor:

- The narrow (23 1/2") doorway in the center hallway is a barrier to passage by visitors in wheelchairs.

A usual tour of the site starts at the front door and makes use of the center hallway to move from the front of the building to the back. (See plan of first floor below with usual tour route.) Visitors are not normally permitted to walk about in the rooms with the exception of the kitchen where movement is along a carpet. They are allowed to enter the room and stand in a roped off area just inside the door.

Although the front entrance of the Derby House has four stone steps and is thus inaccessible to those in wheelchairs, the back kitchen entrance is at ground level and offers reasonable access. Once inside the kitchen, however, a visitor in a wheelchair is limited in enjoyment of the site unless some alteration of the center hallway or modification of the tour route is made.

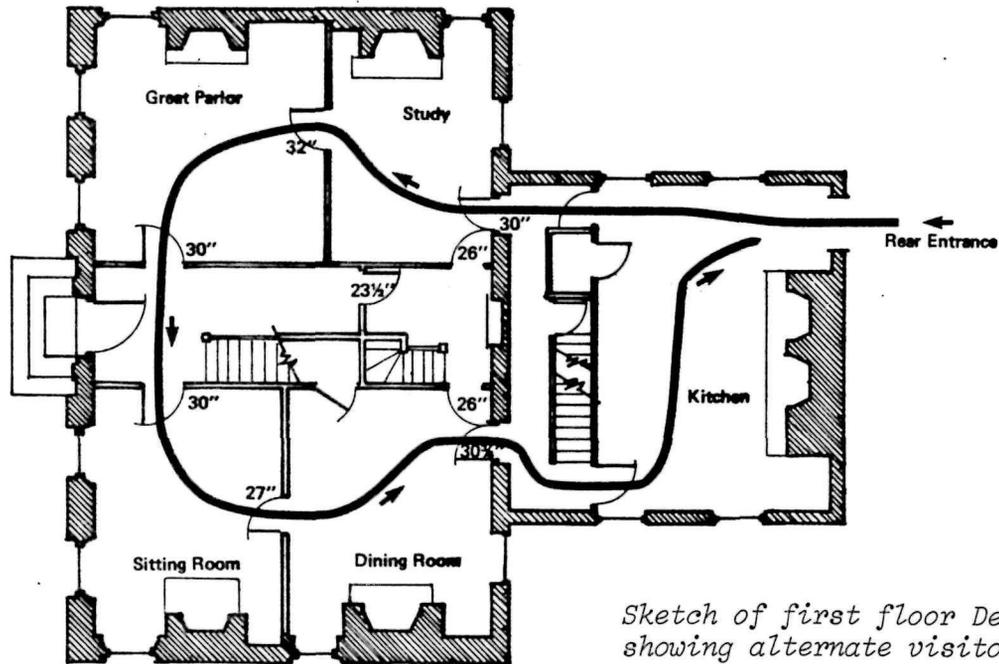
IV. PROPOSED SOLUTIONS

After careful evaluation of the problem of the narrow hall doorway, the following alternate solutions were proposed:

1. Widen the doorway at the center hall by removing the door and moulding strips at the frame.
2. Reroute the visitor tour for individuals in wheelchairs so as to use wider doorways.

As mentioned before, the present clear opening of the center doorway is 23 1/2 inches. If the door were removed, the clear opening would be increased to 24 1/2 inches. The doorway has molding strips on top of the frame. If these molding strips were removed, the opening would be 26 1/2 inches. Such an opening would permit access for those in narrow wheelchairs (23-23 1/2") and difficult or impossible access for those with average wheelchairs. Visitors with wheelchairs as wide as 29 inches would be unable to use this doorway. Further alteration of the frame, such as removal and installation of a wider frame would result in irreversible damage to the historic fabric and is not considered to be a serious alternative.

As noted below in the sketch of the first floor, the second solution calls for the tour to go from the kitchen through a 30 inch doorway (normally kept closed) to the study. Visitors in wheelchairs would then be permitted to travel the length of the study, pass through a 32 inch doorway and enter the great parlor. Thirty inch doorways at the hallway would allow wheelchairs to pass through into the sitting room. From there a 27 inch doorway might prove inaccessible to some individuals in wide wheelchairs. Those in standard wheelchairs would have to be pushed through the opening, so as not to hurt their knuckles while propelling themselves through the narrow opening. Travel through the dining room and back to the kitchen would complete the tour. Those visitors who found the 27 inch doorway to be a barrier would have to retrace their route in order to return to the kitchen.



V. DISCUSSION AND CONCLUSION

When presented with the above two solutions to the narrow center doorway problem, the second option is clearly superior. It achieves access by changing the tour route and has negligible effect on the historic fabric when individuals in wheelchairs, and possibly accompanying visitors travel over the well worn floor boards. The second option would necessitate changing the tour and accompanying interpretation, but it is felt that if all visitors in the group were given this modified tour, no segregation or separate treatment of a handicapped person would result. Since the tour is always guided, staff assistance to push wheelchairs is available.

This case illustrates how administrative accommodation in the form of a modified tour pattern and possible staff assistance can achieve at least a BELOW STANDARD level of physical access. When compared to the damaging effects of alterations, this creative solution seems to provide reasonable access while respecting the historic value of the center hallway.

CASE STUDY NO. 4: ARLINGTON HOUSE, THE ROBERT E. LEE MEMORIALACCESS TO THE SITEI. INTRODUCTION

This antebellum home of the Custis and Lee families, located in the midst of the Arlington National Cemetery is discussed here in relation to access to the site. Normally, visitors are not allowed to drive to the house in their own vehicles, instead they must transfer to private tour buses in the entrance parking lot. These tour buses are not accessible to visitors in wheelchairs.

There are no parking spaces at the site itself, however, visitors could disembark at a circular drive in the back of the house. A parking lot near the old cemetery administration building has a walkway to the Arlington House that is steep and approximately 1/8 mile long. Walking or wheeling at the site is difficult. The paths are not stabilized. They are covered with the same type of loose one-half inch round stones that were used 200 years ago. Stone paths extend around the house. Visitors are allowed to walk on paths near the house, but are not allowed to roam freely over the grounds.

II. CLASSIFICATION OF THE SITE

The Arlington House is classified as follows:

SIGNIFICANCE:	national
REASON FOR SIGNIFICANCE:	home of famous person
TREATMENT:	restoration
USE OR FUNCTION:	house museum
YEARLY VISITATION:	500,000
LOCATION:	urban
STAFFING:	3 full-time, 2 part-time, plus 3-4 additional in summer.

III. ACCOMMODATION PROBLEM IDENTIFIED

A survey of the site using the Detailed Survey Checklist revealed the following two problems related to Parking Lots and Walks:

1. Tour buses which transport visitors from the parking lot to the site are not accessible to individuals in wheelchairs.
2. Paths at the site are covered with stones which is a barrier for those in wheelchairs and a problem for those who walk with instability.

It is important to understand that wheelchair travel over small stones is very difficult. The wheels sink into the stones, making it difficult for persons in wheelchairs to propell themselves. It is likewise difficult and tiring for somebody else to push an individual in a wheelchair.

Those who use crutches or canes also have a difficult time with stones. Tips of crutches sink into the ground and may slip as the user walks. If deep, the stones may also make it difficult for visitors using crutches to swing their feet as they walk.

IV. PROPOSED SOLUTIONS

A careful analysis of the problems described above resulted in the following alternate solutions:

Problem No. 1 - Access to the site

1. Install a hydraulic wheelchair lift in a tour bus.
2. Allow visitors in wheelchairs to drive or be driven to the house in an automobile and park in the driveway at the rear of the house.
3. Allow visitors in wheelchairs to drive or be driven to the house and disembark. Provide staff to park the visitor's car or van at the cemetary parking lot.
4. Provide an additional vehicle that would transport an individual in a wheelchair to and from the site. Provide staff to drive the vehicle if necessary.

Problem No. 2 - Access around the site

1. Pave walks or stabilize them by other means.
2. Place wooden or metal walkways over stone paths.
3. Provide staff assistance to push individuals in wheelchairs around the site as needed.
4. Provide a vehicle to transport individuals in their wheelchairs around the site. Provide staff to assist visitors and drive the vehicle if necessary.

The proposed solutions to each problem were then evaluated using the Accommodation Worksheet.

ACCOMMODATION WORKSHEET

HISTORIC SITE: ARLINGTON HOUSEACCOMMODATION PROBLEM: Tour buses which transport visitors from the parking lot to the site are not accessible to individuals in wheelchairs.

EVALUATOR _____ DATE _____

PROPOSED SOLUTIONS	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
	Install a hydraulic wheelchair lift in a tour bus.	Allow visitors in wheelchairs to drive to house and park in driveway.	Allow visitors in wheelchairs to drive to house. Provide staff to park vehicle.	Provide additional vehicle that would transport visitor in wheelchair
ACCOMMODATION BENEFIT	Independent access in integrated manner \oplus	Convenient for handicapped visitor \oplus	Convenient for handicapped visitor \oplus	Provides access to grounds and site. Tends to segregate. \oplus
EFFECT ON HISTORIC FABRIC	None \oplus	Visitor vehicles are significant intrusion. \oplus	None \oplus	Slight visual intrusion of modern vehicle on grounds. \oplus
COST	Over \$14,000 each \ominus	None \oplus	None \oplus	? \ominus
TIME	Several months \ominus	Slight \oplus	Slight \oplus	? \ominus
IMPACT ON NPS STAFF	Some assistance may be needed with lift. \oplus	Slight \oplus	Requires staff to park vehicles and return at the end of the visit \oplus	May require staff to operate \oplus
SAFETY	Good \oplus	None \oplus	Safety of driving other person's specially equipped car \ominus	Good \oplus
OTHER	Some maintenance required \oplus	Intrusion on other visitors \ominus	Slight \oplus	Maintenance \ominus
SUMMARY	Change is to modern vehicle. Allows integrated access.	Creates visual intrusion	Requires considerable staff assistance	Versatile solution. Access to site and grounds. May require extra staff.
RECOMMENDATION	Preferred solution	Intrusion is too great.	Consider as interim solution	Explore to see if vehicle exists and feasibility.

ACCOMMODATION WORKSHEET

HISTORIC SITE: ARLINGTON HOUSE, THE ROBERT E. MEMORIALACCOMMODATION PROBLEM: Paths at the site are covered with stones which is a barrier for those in wheelchairs & a problem for those who walk with instability

EVALUATOR _____ DATE _____

PROPOSED SOLUTIONS	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
	Pave walks or stabilize them by other means	Place wooden or metal walkways over stone paths.	Provide staff aid to push persons in wheelchairs around the site as needed	Provide vehicle to transport visitors in wheelchairs around site. Provide assistance.
ACCOMMODATION BENEFIT	Independent access in integrated manner (+)	Independent access in integrated manner (+)	Integrated access with some loss of independence (+)	Provides access to grounds and site. Tends to segregate. (+)
EFFECT ON HISTORIC FABRIC	Visual intrusion. Paving may be incompatible with historic fabric (-)	Significant modern intrusion reversible. (-)	None (+)	Slight visual intrusion of modern vehicle on grounds (+)
COST	\$8,000 (-)	\$2,000 (-)	None - unless more staff needed (+)	? (-)
TIME	1 week (+)	1 week (+)	Slight (+)	? (-)
IMPACT ON NPS STAFF	None (+)	Slight (+)	Depends on number of visitors requiring assistance. Pushing may be difficult. (-)	May require staff to operate (+)
SAFETY	Good (+)	May be slippery when wet (-)	Safety of driving other person's specially equipped car. (+)	Good (+)
OTHER	None (+)	May require special removal of snow and ice (-)	None (+)	Maintenance (-)
SUMMARY	Excellent access, but a visual intrusion	Good access, but visual intrusion. Walkways may be difficult to maintain	Significant impact on staff. Not all will be able to push wheelchairs over stones.	Versatile solution. Access to site and grounds. May require additional staff.
RECOMMENDATION	Other options are acceptable and less intrusive	Least desirable - temporary, incompatible modern intrusion.	Non-intrusive, but unsatisfactory solution	Explore to see if vehicle exists and feasibility

V. DISCUSSION AND CONCLUSION

Analysis of the alternate solutions to problem No. 1 - access to the site - indicates that there are three favorable options.

- Install a hydraulic wheelchair lift in a tour bus.
- Allow visitors in wheelchairs to drive to the site and disembark. Provide staff to park the visitor's car or van.
- Provide an additional vehicle that would transport an individual in a wheelchair to and from the site.

The choice among these options may depend on the availability of staff, the time needed for implementation of the solution and available funds. A tour bus equipped with a wheelchair lift allows visitors in wheelchairs to use the same facilities as other visitors in accordance with Park Service Management Policies (1978, III-7). Retrofitting of a bus may, however, be a lengthy process. In the meantime, one of the other two options may have to be implemented.

The problem of access around the site has only one feasible solution:

- Provide a vehicle to transport individuals in their wheelchairs around the site. Provide staff to drive the vehicle if necessary.

Other options considered are ineffective and/or would result in serious visual intrusion.

The reason why individuals should be transported in their own wheelchairs as opposed to being transferred to a seat in a vehicle is that such transfer is difficult or impossible for many visitors in wheelchairs. Those people with paralysis of arms and hands may need to remain in their own wheelchair. Likewise, other individuals may have support systems attached to the wheelchair which cannot be detached or are difficult to remove. For a solution to be effective for all visitors in wheelchairs, as well as others who walk with instability, the vehicle should have a wheelchair lift and space to load a wheelchair.

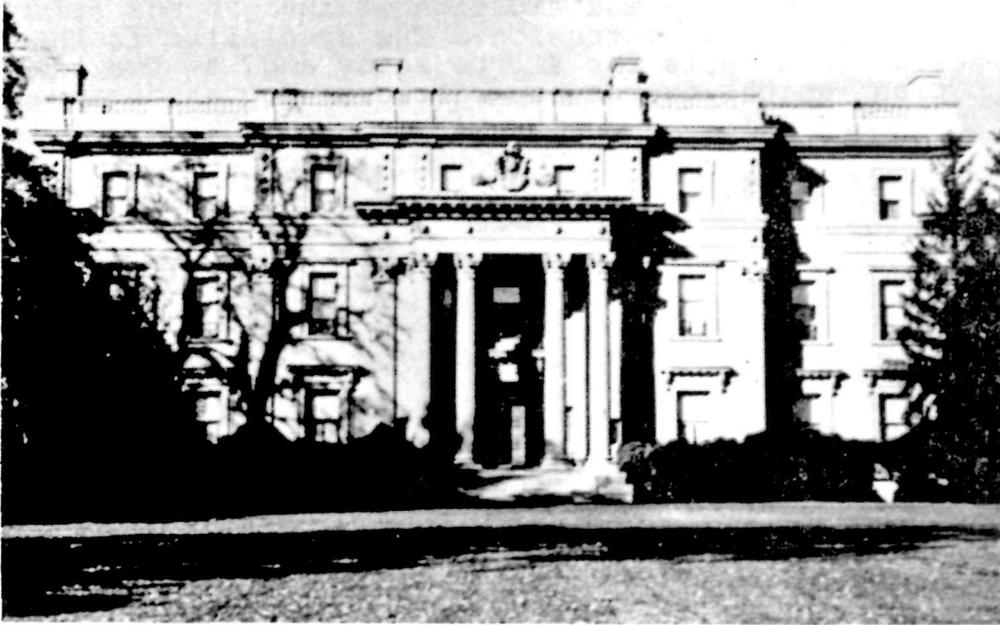
At present there is no known vehicle that would serve this purpose. Any van would likely be large and limit the view of a passenger. A one passenger vehicle such as the one described on page of "Appendix A - Selected Devices to Assist Handicapped Individuals at Historic Sites", will carry an individual in a wheelchair, but the visitor must be able to control the vehicle alone. What is needed is a vehicle driven by a staff member with space for one person to sit and another person to be loaded while in a wheelchair. Further study is required to locate such a vehicle if already in existence, or to determine the feasibility of modifying a vehicle or building one.

When the two problems are considered together, only the vehicle described above is capable of traveling over roads and stone paths.

If this option were seriously explored, or if some combination of accessible bus and other vehicle were decided upon, it is still necessary to devise an interim solution. In this case, alternate accommodation (administrative) which involves staff assistance may be

needed. This might take the form of allowing individuals to disembark at the rear of the house, parking their cars or vans and assisting them over paths.

In all, the grounds of the Arlington House provide beautiful complement to a historic home. Any modification of the grounds (also historic) would be a major visual intrusion. The specialist is thus challenged to preserve this site for all to enjoy and, at the same time, devise a plan which overcomes barriers to handicapped individuals.

CASE STUDY NO. 5: VANDERBILT MANSION NATIONAL HISTORIC SITEACCESS TO OTHER FLOORSI. INTRODUCTION

This 19th century palatial mansion is a "Living History" area. Built by the Vanderbilts, it is a magnificent example of the style of life of a wealthy American family.

This site was chosen for study because the building contains a private residential elevator which is so small it does not allow a wheelchair to enter and maneuver properly. If usable, it would allow access to the basement and three upper floors. The elevator is especially important because entrance to the building may best be achieved through the basement entrance at the kitchen, the front entrance having 12 stone steps. If this is the case, individuals in wheelchairs need to get from the basement to the main and upper floors once inside the building. This can only be done by elevator.

For purposes of this study, we will consider the problem of access to other floors from the perspective of an individual in a wheelchair. Modification of stairs to accommodate individuals who walk with instability and those with visual impairments has been discussed in Chapter 5 "Typical Solutions to Typical Problems."

II. CLASSIFICATION OF THE SITE

SIGNIFICANCE:	national
REASON FOR SIGNIFICANCE:	representative of the style of life of a 19th century wealthy family
TREATMENT:	preservation

USE OR FUNCTION: house museum
SECTOR: public
YEARLY VISITATION: 300,000
LOCATION: rural
STAFFING: 20 (summer) 10 (winter) for Vanderbilt and Roosevelt's home.

III. ACCOMMODATION PROBLEM IDENTIFIED

A survey of the site using the Detailed Survey Checklist, revealed the following problem related to access to other floors:

- Once inside the building, all other floors are inaccessible to visitors in wheelchairs.

There are three means of access to the other floors:

- one stairway (magnificent and historically important) leading from the first floor to the second floor;
- one stairway leading from the second floor to the third floor;
- one servant's stairway leading from the first floor to the third floor; and
- one residential elevator going from the basement to the first, second and third floors.

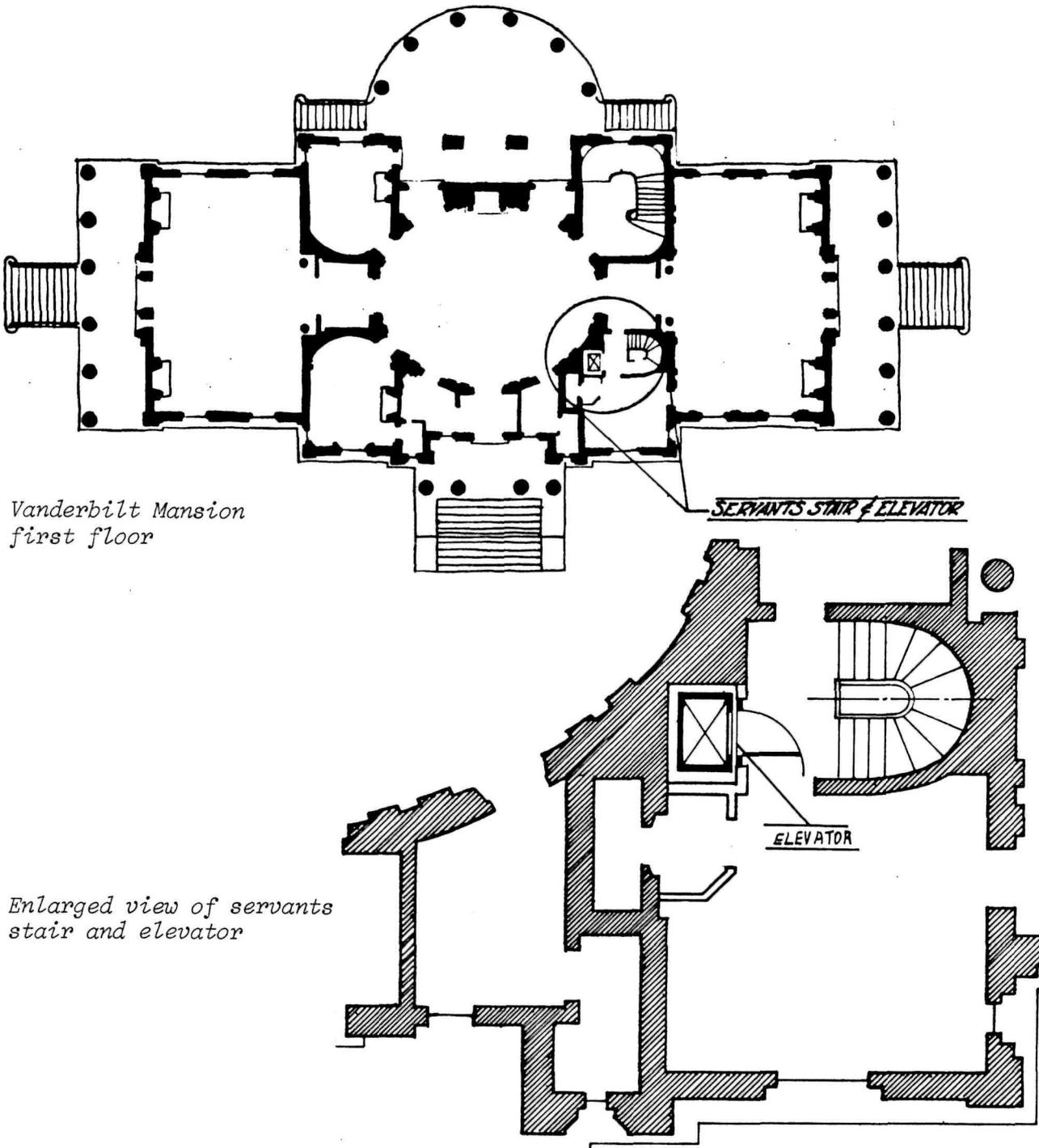
The residential elevator is 41" wide by 36 3/4" deep, with a door opening of 31 1/2". Most wheelchairs are 48" front to back and cannot fit into an elevator which is 41" wide. Even if the width were more than 48", a wheelchair would have to make a 90 degree turn to fit inside the elevator sideways and a depth of 36 3/4" does not provide enough space for such a maneuver.

IV. PROPOSED SOLUTIONS

Careful analysis of the problem revealed the following alternate solutions:

1. Remove the entire servant's stairway and install a large elevator for the public.
2. Enlarge the shaft of the existing residential elevator and install a new and larger car for elderly and handicapped visitors.
3. Install a closed circuit television system that would allow visitors to view other floors from the basement or from the visitor center.
4. Create an audio-visual presentation which depicts inaccessible areas with accompanying narrative. Locate this presentation in an accessible location.

A sketch of a portion of the first floor below reveals some detail about the existing servant's staircase and the residential elevator. Further field measurements by elevator consultants would be required to determine the adequacy of the open center well which houses the present staircase. Modification of the elevator shaft would involve removal of a small percentage of the stone pier surrounding the elevator.



The proposed solutions to this problem were then evaluated using the Accommodation Worksheet.

ACCOMMODATION WORKSHEET

HISTORIC SITE: VANDERBILT MANSION

ACCOMMODATION PROBLEM: Once inside the building, all other floors are inaccessible.

EVALUATOR _____

DATE _____

PROPOSED SOLUTIONS	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
	Remove servant's stairway and install elevator.	Enlarge shaft of existing residential elevator and install new and larger car.	Install closed circuit television system to view other floors.	Create audio-visual presentation which depicts inaccessible areas.
ACCOMMODATION BENEFIT	Permanent solution. Independent access. Integrated setting. (+)	Permanent solution. Independent access. Integrated setting. (+)	Second-hand experience. Should be used by all visitors. (-)	Second-hand experience. Some integration if shown on site to all visitors. (-)
EFFECT ON HISTORIC FABRIC	Serious and irreversible destruction of historic fabric. (-)	Irreversible. Destruction of original elevator car but minimum intrusion on other features. (-)	Installation of cameras could be hidden partially, but still is modern intrusion. (-)	Varies (+)
COST	80,000 (-)	70,000 (-)	20,000 (-)	5,000 (+)
TIME	3 months (+)	3 months (+)	1 month (+)	3 months (+)
IMPACT ON NPS STAFF	No staff assistance needed. (+)	No staff assistance needed. (+)	Requires staff to supervise visitor viewing area. (+)	Requires staff to show presentation. (+)
SAFETY	May be illegal, two stairs are needed for exit. (+)	Slight (+)	Slight (-)	None (+)
OTHER	Requires maintenance. (+)	Requires maintenance. (+)	Requires maintenance. (+)	Slight (+)
SUMMARY	Major destruction. Significant intrusion. May be illegal-limits exit in emergency.	Expensive, but provides full access. Historic fabric is affected in minor way.	Second-hand experience of site. Requires installation of equipment.	Second-hand experience of site. May be of benefit to all visitors.
RECOMMENDATION	Reject this solution.	Further feasibility study is required by architectural specialist.	Is more realistic than audio-visual.	Consider as alternative to existing elevator.

V. DISCUSSION AND CONCLUSIONS

Analysis of the proposed solutions indicates that enlarging of the existing shaft and installing a larger elevator car should be explored in more detail before considering interpretive alternatives. The requirement that buildings have two means of egress would invalidate the solution of removing the servant's staircase.

Such structural alterations to a building may seem extreme, yet considering the high yearly visitation and the prominence of the site as a cultural resource, it is important to explore all ways of allowing visitors in wheelchairs to gain access to all floors. Alterations to the elevator would probably entail irreversible damage to the historic elevator. At the same time, since the elevator is not normally used by the public and is kept closed, visual intrusion is minimized.

This case study was chosen to describe an unusual example of where a major structural alteration might be considered in preference to alternative accommodation.

The existence of a possible solution in the form of the residential elevator presents a challenge to the specialist to evaluate the feasibility of such a solution. While this solution is being investigated, alternative accommodation in the form of a simple audio-visual presentation of inaccessible areas can and should be used as an interim solution. Such a presentation will be looked upon as a good faith effort to provide at least some accommodation.

Appendix

Cost Data and Time Estimates

INTRODUCTION

The cost and time estimates listed here are intended to familiarize specialists with the approximate costs and time necessary for removing typical barriers.

Cost estimates are based on 1979 prices. The actual cost of removing a barrier may vary according to such factors as: inflation, geographic location, labor, contractor's profit, and availability of materials.

Time estimates reflect the time needed to remove and correct each barrier under normal circumstances. As with costs, times can vary.

The estimates listed here do not include costs and time necessary for planning, architectural and engineering surveying, or project coordination.

<u>Parking Area</u>	<u>Cost</u>	<u>Time</u>
Blacktop parking area (small area)	\$ 1.25/sq ft.	1 week
Special parking space: stripes, post and sign	150.	1 day
<u>Sidewalks</u>		
Concrete sidewalk (small area)	2.75/sq ft.	3 days
Concrete curb cut	650 for one	2 days
<u>Entrance Ramp</u>		
Concrete ramp, 4'6" wide, average	20/sq ft. plus founda- tion	1 week
1-1 1/4" i.d. steel pipe railing, galvanized and painted	45/lin. ft.	2 days
Metal ramp	15/sq ft. (without rail- ing)	
	40/lin. ft. for railings	2 days
<u>Doorways</u>		
Widen wood door and frame in wood construction, paint	1,000 each	1 week
Remove pair of narrow wood doors and install wide door and panel, paint	1,000 each	1 week
Remove pair of narrow wood doors and frame and install pair of wide doors and frame in wood construction, paint	2,000 each	1 week
Remove narrow wood door and frame and enlarge masonry opening, install wider door and frame, paint	500 each	2 weeks

<u>Doorways</u>	<u>Cost</u>	<u>Time</u>
Change door opening hardware	\$ 400	1 day
Change door closer	200	1 day
Remove and change threshold	100	1 day
Create new doorway in wood frame construction	1,000	2 weeks
Create new doorway in brick construction	1,500	2 weeks
<u>Interior Stairways</u>		
Rebuild interior wood stairs, assume straight run, 15 risers	4,000	3 weeks
Rebuild interior wood stairs, two runs, 10 risers each	6,000	3 weeks
Rebuild stairwell railing	1,000	3 weeks
Fill in open risers	150	3 days
Install handrail on walls	20/linear foot	2 days
<u>Floors</u>		
Carpet floor	2/sq.foot	2 days
Carpet stairs	300/stairway	2 days
<u>Toilet Rooms</u>		
Convert two toilet stalls into one large stall, with new metal partitions for stall approx. 5' x 5'. Remove one water closet, patch floor and walls, paint or tile to match, install 34" door swinging out and two grab bars	1,000	3 weeks
Relocate one wall mounted lavatory, install one lower mirror and dispensers	500	1 week
Lower one urinal	500	1 week
Install slanting mirror and dispenser	125	1 day

<u>Elevators</u>	<u>Cost</u>	<u>Time</u>
Install new elevator in new building, assume three floors, 625 lb. capacity, electric traction type	50,000	3 months
Install electric elevator in similar, but historic building	\$ 80,000	3 months
Install similar electric elevator at exterior, masonry shaft	70,000	3 months
Install similar hydraulic elevator at exterior, masonry shaft	65,000	3 months
Install elevator electric eye and adjust doors	1,200	1 week
Widen doors to existing elevator, three levels.	10,000	4 weeks
Lower elevator controls in car	2,000	2 weeks
Enlarge existing elevator car by enlarging shaft with new car and controls	80,000	3 months
Install Residential Elevator	20,000	3 months
<u>Wheelchair/Chairlifts</u>		
Install inclined wheelchair lift	5,000 - 9,000	1 week
Install vertical wheelchair lift	4,000	1 week
Install inclined chair lift	3,000	1 week
<u>Drinking Fountains</u>		
Install new wheelchair-type drinking fountains	900	3 days
Lower drinking fountain	400	1 day
Install drinking cup dispenser	20	10 minutes
<u>Telephones</u>		
Lower public telephone, patch and paint wall	100	1 day
<u>Signs</u>		
Install visual-and-tactile signs	100	1 day
Install visual-only signs	75	1 day

Selected Devices to Assist Handicapped Persons

INTRODUCTION

The devices listed in this catalogue were selected to assist specialists in providing accommodation for handicapped visitors at historic sites. The catalogue focuses primarily on those devices that help achieve accessibility, i.e., physical access to the site and its facilities. Devices for hearing and visually impaired persons are included to familiarize specialists with devices that assist in providing administrative and interpretive accommodations.

Prices, where listed, are approximate and may vary. Those prices followed by an asterisk (*) are 1978 prices, otherwise the prices listed reflect 1979 costs.

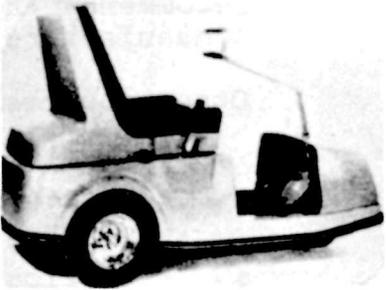
This catalogue describes some typical devices in several areas. It is not an exhaustive list of all devices or all manufacturers.

The National Park Service does not endorse the products listed here or recommend them over any other product not mentioned. Any omission of a manufacturer of a particular device is unintentional.

Other sources of manufacturer's literature include:

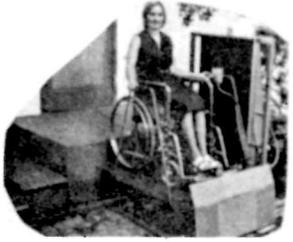
- Local surgical supply houses.
- "Accent on Living Buyer's Guide" published by Raymond C. Cheever, (P.O. Box 700 Bloomington, IL 61701).
- Publications of groups representing or serving handicapped individuals.

M O B I L I T Y A I D SWHEELCHAIRS AND RELATED MOTORIZED VEHICLES

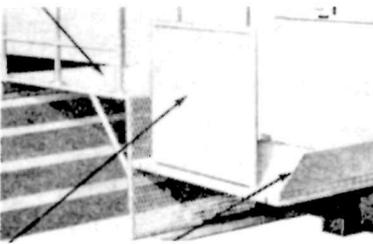
<u>ITEM</u>	<u>COMPANY ADDRESS</u>	<u>PRODUCT DESCRIPTION</u>	<u>COST</u>	<u>PHOTOGRAPH</u>
Ricon R30A Van Lift	Freewheel Vans, Inc. 15910 W. 5th Avenue Golden, CO 80401 (303) 278-2972	Electrohydraulic power. Lifts individual in wheelchair into van.	Varies	
Electric Wheelchair	Everest & Jennings 1803 Pontius Avenue Los Angeles, CA 90025 (213) 478-1057	Model No. 3P (Batteries) 29" wide	\$2192 \$100	
Manual Wheelchair	Everest & Jennings	Model No. 34 Wheelchairs can be made as narrow as 23". The price will vary according to the size.	\$1374	
Executive 2001	Division of Kady-Kart, Inc. Mapletree Industrial Park Palmer, MA 01069	A dignified chair on wheels. Standard: Wheel Ease: Push Chair: (Organizations get a 15% discount)	\$549 \$569 \$395	
Amigo	Amigo Sales, Inc. Dept. AL-68 6693 Dixie Highway Bridgeport, MI 48722 (517) 777-0910	Amigo - battery operated Indoor only.	\$1000	
Portascoot	E.F. Brewer Company P.O. Box 159 Menomonee Falls, WI 53051 (800) 558-8777	65000 ADJ Fiberglass Seat with Pneumatic Tires. 64000 Sling Style Seat 64050 Sling Style Seat with Pneumatic Tires.	\$854 \$660 \$708	
Braun Tri-Wheeler	The Braun Corporation 1014 South Monticello Winamac, IN 46996 (219) 946-6157	Model No. JSM Model No. TSM Model No. RTM	*\$1695 *\$1695 *\$1595	
PQ-22 Electric Wheelchair	Para Quad, Inc. 3614 West 2100 South Salt Lake City, Utah 84120 (801) 973-6790	Electric Wheelchair	\$3622.50	
Voyager III	Voyager Ltd. P.O. Box 1577 South Bend, IN 46634 (219) 288-5011	Similar to a one-person golf cart	Varies	
Golf Carts	Harley Davidson Motor Company 37th Juneau Milwaukee, WI (414) 342-4680 (617) 757-0002	3 wheel with gas 3 wheel electric 4 wheel with gas 4 wheel electric	\$2355 \$2025 \$2571 \$1680	

Fun Machines	Fun Country 29833 Ruby Road Evergreen, CO 80439 (303) 526-0664 Fun Country 3720 40th Street Court Moline, IL 61265 (309) 797-3618	Fun Machine 6-wheel drive, 4 passenger seating. Travels over all terrain. (used models less than half price)	*\$2695	
Volt Colt	Trans-Electric Engineering Company P.O. Box 701 Meridan, Idaho 83642 (208) 888-6954	Cart which carries individual in wheelchair. Wheelchair rolls directly onto platform.	\$2395	
Special Care Buses	Wayne Corporation P.O. Box 1447 Industries Road Richmond, IN 47374 (317) 962-7511	Transette 11-15 students Automatic Lifts Busette 11-15 persons Automatic Lifts Lifeguard 11-15 individuals Automatic Lifts	\$30000 \$11000 \$25000	

R A M P S

<u>ITEM</u>	<u>COMPANY ADDRESS</u>	<u>PRODUCT DESCRIPTION</u>	<u>COST</u>	<u>PHOTOGRAPH</u>
Portable Product Series	Handi Ramp Inc. P.O. Box 745 1414 Armour Boulevard Mundelein, IL 60060 (312) 566-5861	For use in going from one level to another. There must be one foot in length for every inch in height. No skid treadqay 26" x 60" Safety wheel guides 26" x 84" Self cleaning 26" x 120"	\$273.65 \$333.25 \$511.75	
Wheel O Vator	Toce Brothers Manufacturing, Ltd. P.O. Drawer F Youngsville, LA 70592 (800) 551-9095	No. 8SA No-skid skanner plate 38" from curb No. 6S 6' long for 6" curb No. 6SA reversible platform for left or right exit. No. 8S Direct access 8' long	\$392. \$225. \$362. \$390.	

L I F T S

<u>ITEM</u>	<u>COMPANY ADDRESS</u>	<u>PRODUCT DESCRIPTION</u>	<u>COST</u>	<u>PHOTOGRAPH</u>
Butler Wheelchair Lift	Flinchbaugh/Murray Corporation 390 Eberts Lane York, PA 17403 (717) 854-7720	Used to raise individuals from one level to another. Standard indoor unit: Standard outdoor unit:	\$3495 \$3995	
Econo Lift "200"	Earl's Stairway Lift Corporation 2413 AB Center Street Cedar Falls, IA 50613 (319) 277-4777	Used to raise an individual and their wheelchair from one level to another. Standard indoor unit: Standard outdoor unit:	\$3220 \$2880	
Stairway Porch Lift	Earl's Stairway Lift Corporation	For outside use in raising an individual from one level to another.	\$2240	
Cheney Wheelchair Lift	The Cheney Company 3015 South 163rd St. New Berlin, WI 53151 (414) 782-1100	Used to raise an individual and their wheelchair from one level to another.	*\$2450	
The WheelOvator	Toce Brothers Manufacturers P.O. Box 489 Broussard, LA 70518 (318) 856-5941	Used to raise an individual and their wheelchair from one level to another. 42" 60" 72"	\$1506 \$1620 \$1743	
Porch Lift	American Stair Glide Corporation 4001 East 138th Street Grandview, MO 64030 (816) 763-3100	Used to raise an individual and their wheelchair from one level to another. (outside use only)	*\$1695	
Econo-Glide	American Stair Glide Corporation	Assists in raising individual from one level to another.		
Earl's Stair Ride "100"	Earl's Stairway Lift Corporation 2413 AB Center Street Cedar Falls, IA 50613 (319) 277-4777	Assists in raising individuals from one level to another.	\$1695	
Inclinorator	Inclinorator Company of America 220 Paxton Street Harrisburg, PA 17105	Assists in raising individual from one level to another.	Varies	
Inclinette	CMC Residential Elevator Company 51 Dover Terrace Westwood, MA 02090 (617) 329-6477	Assists in raising individuals from one level to another.	*\$1970	
Stair Glide Deluxe	American Stair Glide Corporation 4001 E. 138th Street Grandview, MO 64030	Assists in raising individuals from one outdoor level to another.	\$2200	

Wecolator	The Cheney Company 3015 South 163rd St. New Berlin, WI 53151 (414) 782-1100	Assists in raising individuals from one level to another. For <u>curved</u> , <u>spiral</u> or <u>straight</u> stairs. (13 steps)	_____ *\$2401
Stair Lift	Inclinor Company of America 2200 Paxton Street Harrisburg, PA 17105	Assists in raising individuals from one level to another.	_____ *\$1585
Stair Glide	American Stair Glide Corporation 4001 East 138th Street Grandview, MO 64030 (816) 763-3100	Assists in raising individuals from one level to another.	*\$995
Handi-Lift	The Cheney Company 3015 South 163rd St. New Berlin, WI 53151 (414) 782-1100	Assists in raising person in wheelchair from one level to another.	Varies



ELEVATORS

<u>ITEM</u>	<u>COMPANY ADDRESS</u>	<u>PRODUCT DESCRIPTION</u>	<u>COST</u>	<u>PHOTOGRAPH</u>
Commercial Elevators	Otis Elevator Company Northeastern Region 275 Hancock Street North Quincy, MA 02171	Prices vary according to building and size.	Varies	
Commercial Passenger Elevator	Beckwith Elevator Company 8 St. Mary's Street Boston, MA (617) 267-6006	Runs up to three floors.	*\$30,000 (Equipment only)	
Econo Lift "500"	Earl's Stairway Lift Corporation 2413 AB Center St. Cedar Falls, IA 50613 (319) 277-4777	Economical small elevator, 2-5 stops available. Accessible to wheelchairs. (2 stops)	\$4480	
Elevette	CMC Residential Elevator Company 51 Dover Terrace Westwood, MA 02090 (617) 329-6477	Small, convenient elevator for raising an individual from one to more floors. Accessible to wheelchairs.	*\$3638	
"Elevette"	Inclinor Company of America 220 Paxton Street Harrisburg, PA 17105	For raising an individual from one level to another. Accessible to wheelchairs.	_____ Varies	



DOOR OPERATING EQUIPMENT

The Easy Access	Horton Automatics Overhead Door Corp. 6250 LBJ Freeway Dallas, TX 75204 (214) 233-6611	Automatic Door Button	Varies
Automatic Door Operators	Keane Monroe Corp. P.O. Box 1071 Monroe, NC 28110 (704) 289-5581	Series 100 Can be used on swinging doors, sliding doors, etc. Controlled by pushbutton.	Varies
Power Assist Door Opener	Reading Door Closer Corporation Reamstown, PA 17567 (215) 267-3881	Series 1020 Light Touch	\$550
Automatic Door Opener	TWX 510-651-4527	Series 1010 Automatic	\$700 \$450
Door Opener	Power Access Corp. Box 139 Eatontown, NJ 07724	Opens door by remote control or by switch.	*\$325
Silent Swing	Stanley Door Operat- ing Equipment Division of the Stanley Works Farmington, CT 06032 (203) 677-2861	Opens door by remote control or switch.	*\$600 to *\$750
Environmental Control System	Prentke Romich Co. R.D.2 Box 191 Shreve, OH 44676 (216) 567-2906	Opens door by remote control or switch.	Varies
Series 1010	Reading Door Closer Corp. Reamstown, PA 17567 (215) 267-3881	"Easy Access" - "Lite Touch" Pneumatic Power Opening Hydraulic Closing Door Controls.	Varies
		1010 "Access-Free"	\$700
		1010S "Access-Free" Model Slave Unit	\$450
		1020 "Lite Touch"	\$550

TOILET FIXTURES

<u>ITEM</u>	<u>COMPANY ADDRESS</u>	<u>PRODUCT DESCRIPTION</u>	<u>COST</u>	<u>PHOTOGRAPH</u>
Handi John	Braun Fiberglass Products Division of the Braun Corporation P.O. Box 547 East 47th Street Rochester, IN 46975 (219) 223-3101	Accessible portable restroom.	\$1095	
Handrails and Grab Bars	AMCO Medical Service 11329 N. Central Expressway Dallas, TX 75231 (214) 691-5284	Toilet Compartment Rails: Inclined Bars Toilet Straddle Bars Wall to Floor with Outrigger.		
Toileting Aids	AMCO Medical Service	MO41105 Toilet Assist	\$16.10	
		MO41100 Toilet Armrest	\$16.45	
		MO41107 Toilet Aid with Adjustable width	\$17.50	
		MO41108 Toilet Safety Frames Adjust and non-adjustable	\$	
1" Diameter Grab Bars	E.F. Brewer Company 13901 Main Street Menomonee Falls, WI 53051 (800) 558-8777	A. 28012-2 12" x 5" x 1"	\$16.10	
		B. 28018-2 18" x 5" x 1"	\$16.45	
		C. 28024-2 24" x 5" x 1"	\$17.50	
		D. 28032-2 32" x 5" x 1"	\$18.60	
		E. 28048-2 48" x 5" x 1"	\$30.10	
		E. 28052-2 Corner Rail 25" x 25" x 1"	\$33.35	
		F. 28064-1 Swing Away Bath Seat	\$111.95	
Adjustable Toilet Safety Rails	Edco, Inc. Box 328 125 South Street Passaic, NJ 07055 (201) 472-3173	Made of durable 1" polished aluminum tubing. 6004 Rails 6005 Toilet Guards	\$27.98 \$44.14	
Decorator Grab Bars	Lumex, Inc. 100 Spence Street Bay Shore, NY 11706	Available in all sizes, types and colors shown below. Select type, size and color desired.	12" \$ 9.35 18" \$10.45 24" \$11.10 32" \$12.80 16" \$10.10	
Stainless Steel Handrail	Tubular Specialities Manufacturing, Inc. 8110 S. Beach Street P.O. Box 71527 Los Angeles, CA 90001	railing system, grab bars. Mechanically attached flange series, etc.		

D O O R H A R D W A R E

<u>ITEM</u>	<u>COMPANY ADDRESS</u>	<u>PRODUCT DESCRIPTION</u>	<u>COST</u>	<u>PHOTOGRAPH</u>
Plastic Door Knob Extension	Fred Sammons, Inc. Box 32 Brookfield, IL 60513 (800) 323-7305	This set of four door knob levers attach with a special pressure sensitive tape to door knobs to allow those who lack grasp or strength to open doors easily. Works best on thicker cylindrical knobs. BK-6395-Package of 4	*\$2.00	
Steel Door Knob Extension	Fred Sammons, Inc.	A steel extension handle that attaches to any round door knob to provide leverage for easier opening. Comes with slotted back washer and three mounting screws. BK-6396	*\$3.50	
Med Hinges	M.E.D., Inc. 1275 South Harlem Avenue Forest Park, IL 60130	MED hinges are installed without damage to doors or door sills and allow the door to close flat against the wall. Space is gained by the elimination of the door protruding into the doorway as it does with normal hinges. MO5 6050	*\$14.50	

W A T E R F O U N T A I N S A N D C O O L E R S

<u>ITEM</u>	<u>COMPANY ADDRESS</u>	<u>PRODUCT DESCRIPTION</u>	<u>COST</u>	<u>PHOTOGRAPH</u>
Water Fountain	EPCO Manufacturing Co. 265 North Hamilton Rd. Columbus, OH 43213 (614) 861-1350	Model DP7WM Pipes must already be accessible.	*\$487	
Drinking Fountain	King-Seely Tagimos Co. Route 75 Freeport, IL 61032 (815) 235-0066	Model 6800WC Stainless Steel, can be placed outside.	*\$315	
Water Cooler	EPCO Manufacturing Co.	Model WC7A1	*\$692	

 DEVICES FOR VISUALLY IMPAIRED

<u>ITEM</u>	<u>COMPANY ADDRESS</u>	<u>PRODUCT DESCRIPTION</u>	<u>COST</u>	<u>PHOTOGRAPH</u>
	National Barille Press 88 St. Stephen Street Boston, MA 02115 (617) 742-0937	Will reproduce materials suitable for visually impaired individuals.	Varies	
Print Braille Materials	American Printing House for the Blind Louisville, KY (502) 895-2405	Textbooks, brochures, menus, etc. (minimum of 25 copies required)	Varies	
	Gilligan Tactiles West Newton, MA 02165	Prepares tactile emergency exit plans and site maps in Braille.	Varies	
Sonicguide	Telesensory Systems, Incorporated 3408 Hillview Avenue P.O. Box 10099 Palo Alto, CA 94304 (415) 493-2626	Mobility aid for blind travellers. Indicates distance, location and surface characteristics.	Varies	
Monwat Sensor	Telesensory Systems, Incorporated	Hand held electronic travel aid, clear path indicator and orientation aid. Vibrates.	\$495	
The Optacon Reading Machine	Telesensory Systems, Incorporated	Converts the image of a printed letter into a vibrating tactile form that a blind person can feel with one finger.	\$2895	
Model LT6 3M	National Institute for Rehabilitation Engineering 97 Decker Road Butler, NJ 07405 (201) 838-2500	For reproducing letters in large type	\$277	
Portable Electric Typewriter	National Institute for Rehabilitation Engineering	Illuminated optical magnifiers.	\$289 to \$895	
Typing Element	Royal Business Machines 150 New Park Avenue Hartford, CT 06106 (203) 236-2354	type no. 102. (large type)	\$ 20	
Sight Saver Typewriter	SCM Corporation Consumer Products Division 299 Park Avenue New York, NY 10017 (212) 752-2700	Bulletin Gothic, no. 29 (large type)	\$400	
RS 6	Visualtek 1610 26th Street Santa Monica, CA 90404 (213) 829-6841	gives a greatly magnified image of writing, books and you as you are writing.	\$1,795	

S I G N S

<u>ITEM</u>	<u>COMPANY ADDRESS</u>	<u>PRODUCT DESCRIPTION</u>	<u>COST</u>	<u>PHOTOGRAPH</u>
"Parking Ticket Reminders"	The Mobility Barriers Section 830 K Street Mall Sacramento, CA 95814	5" x 3" parking reminders for use on illegally parked in spaces reserved for handicapped individuals.	Varies	
Signs	Seton Name Plate Corporation 592 Boulevard New Haven, CT 06505 (203) 772-2520	Will make any accessibility sign requested.	Varies	
Braille and Raised Print	ARTS Associates, Inc. 80 Boylston Street Boston, MA 02166	Braille and raised print. Three signs in one.	Varies	

DEVICES FOR HEARING IMPAIRED

DEVICES FOR THE HEARING IMPAIRED

<u>ITEM</u>	<u>COMPANY ADDRESS</u>	<u>PRODUCT DESCRIPTION</u>	<u>COST</u>	<u>PHOTOGRAPH</u>
Portatel	Specialized Systems, Inc. 215 South Highway 101 Suite 203 Solana Beach, CA 92075 (714) 481-6000	Operated like a typewriter through an ordinary phone receiver to another phone receiver.	Varies	
Visual Ear	Rentronics, Inc. 2395 Bayview Avenue Willowdale, Ontario M2L 1A2 447-5391	Operated like a typewriter through an ordinary phone receiver to another phone receiver.	Varies	
Magsat	Magsat Corporation 56 Arbor Street Harford, CT 06106 (203) 525-4238	Operates like a typewriter through an ordinary phone receiver to another phone receiver.	*\$695	
TV Phone	Phonics Corporation 814 Thayer Avenue Silver Spring, MD 20910 (301) 588-8222	Similar to above with television screen display.	Varies	
Manual Communications Module/Dual Display	Micon Industries 252 Oak Street Oakland, CA 94607 (415) 763-6033	Allows face to face communications, with or without telephone access. Uses a dual display board on each unit.	*\$995	

Devices For The Hearing Impaired Continued

<u>ITEM</u>	<u>COMPANY ADDRESS</u>	<u>PRODUCT DESCRIPTION</u>	<u>COST</u>	<u>PHOTOGRAPH</u>
	Dr. Malcolm J. Norwood Chief of Captioned films and Telecommunications Branch Donohoe Building U.S. Office of Education 400 Maryland Avenue, S.W. Washington, DC 20202 (202) 472-1164	National Captioning Center will do captioning for anyone.	Varies	
	Harper's Ferry Center National Park Service Harper's Ferry, W. VA 25425 (304) 535-6371	Make films, design brochures, and create exhibits for NPS.	Varies	
	Pilgrim Film Services 2504 50th Avenue Hyattsville, MD 20781	Caption 16 mm and 35mm films and 35mm slides for deaf.	Varies	
Telephone Amplifier	Bell Telephone Company (local)	Inserted into the phone receiver.	Varies	

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This Technical Manual is one document of a series. For further information see:

Volume I - Accommodation of Handicapped Visitors at Historic Sites: GUIDE, U.S. Department of the Interior, National Park Service, 1979 (DRAFT).

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