The Great Trinity Forest Management Plan

Volume 7
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DEMAND FOR RECREATION OPPORTUNITIES

Demand for outdoor recreation opportunities within the Dallas area is important when considering opportunities to be provided at the Great Trinity River Forest. Suppliers of outdoor recreation opportunities want to offer activities that will meet the needs and desires of the public for several reasons. Because of limited resources it is most efficient to offer activities that are in demand by the public. By offering activities that are in demand there is no need to "sell" the product or service as it basically sells itself.

In determining the demand for various outdoor recreation opportunities it is useful to examine nationwide participation in outdoor recreation activities, since local populations generally do not vary substantially from the rest of the nation. The National Survey of Recreation and the Environment (NSRE) involved a comprehensive telephone survey of Americans nationwide and their participation in specific recreation activities. A series of NSRE surveys have been completed and, from this series, trends can be seen. The emphasis of the study is on the frequencies and percentages of participation by a sample of Americans in various outdoor recreation activities. Version's one through five of the NSRE 2000 covered more than 50 activities from casual walking outdoors to more challenging activities such as mountain biking and scuba diving. Some of these activities are, or could be, provided by the Trinity River Forest.

According to a study by Texas A&M titled Texas Outdoors: A Vision for the Future (1998) Texas ranks 49th in the nation for per capita spending on state parks; the state falls 63 percent below the national average. The study also noted that future recreation demand would increase but that demographic changes in the state will be an even greater challenge as providers struggle to respond to the changing needs of Texans. The study recommended that a Community Outdoor Outreach Program be created to respond to the needs of underserved populations especially in major metropolitan areas. The City of Dallas has a tremendous opportunity to reach out to its diverse urban population with programs that encourage children and their families to engage in outdoor recreation at the Great Trinity Forest.

Activities that are in demand nationwide, and could be provided by the Great Trinity Forest, include: hiking, mountain biking, horseback riding, nature trails, wildlife viewing, picnicking or sites for family gatherings, camping, and access for river fishing.

The face of Texas is changing (Texas A&M, 1998) and by 2030 Hispanics will be the largest group among an expected 34 million Texans. The median age and proportion of older age groups will increase and 90 percent of Texans will live in metropolitan areas. "Lack of time" will be the primary constraint to recreation. The largest recreation growth will occur in fitness activities, followed by pleasure walking, family gatherings, beach visits, picnics, sightseeing, nature center visits, sporting event attendance and historic site visits. Opportunities exist for creating large, intensive-use outdoor

recreation opportunities and park land in areas surrounding the states fastest-growing cities including Dallas-Fort Worth (Texas A&M, 1998).

In order to monitor demand at the Great Trinity Forest an annual list of benefits provided by the forest should be compiled and shared on the website, in public service announcements, with local leaders, and at other venues. The list would include groups that visited the forest (Boy Scouts, local community leaders or businesses), events conducted by the forest, volunteer hours and the value of those hours, and number of visitors. In this way the citizens will be aware of the value that the Great Trinity Forest provides.

Ethnic Participation in Outdoor Viewing and Learning Activities

Like most urban areas, the population of Dallas is younger and more ethnically diverse than more rural areas. The growth of the Hispanic community offers opportunities for providing information about recreation opportunities through brochures, websites and other information printed in Spanish.

According to the NSRE, in 1900 87.9 percent of the U.S. population was white, mostly non-Hispanic. Blacks were 11.6 percent of the population. In 1990 75.6 percent of the population was non-Hispanic white, and Hispanics were 9 percent. Recent (August 2004) population projections show the proportion of Hispanics in the U.S. continuing to grow to 14.1 percent with whites dipping to 67.3 percent.

The NSRE Recreation Statistics Update, December 2004, describes comparisons of viewing/learning activity participation for three segments of our population: white Non-Hispanic, Hispanic of Mexican origin, and Hispanic not of Mexican origin. The NSRE examined 13 outdoor recreation activities emphasizing viewing, learning, photographing and sometimes gathering as the mode for participation.

Three things about the participation rate comparisons in the table below stand out. First, overall white participation rates are substantially higher across the listed activities, but for one, visiting prehistoric and other archeological sites. For many activities, the difference is large. For example, the participation rates in viewing and photographing natural scenery is 20 to 25 percent greater for non-Hispanic whites than for Hispanics. Visiting historic sites for non-Hispanic whites is approximately double the rate for Hispanics. And gathering natural products (such as berries or mushrooms) is also nearly twice the Hispanic rate. Second, Hispanics not of Mexican origin participate in all activities but caving at higher rates than Mexican Hispanics. Third, activities with especially low participation rates by Mexican Hispanics relative to whites include sightseeing, viewing and photographing wildlife (not including birds), visiting historic sites, and going on boat tours or excursions to see whales or other natural water attractions.

Table 1. Comparison of percentages of three segments of the U.S. population participating in viewing/learning outdoor activities, 2000-2004.

Activity	White/ Non-Hispanic Percent participating		Hispanic/ Mexican Origin Percent participating		Hispanic/ not Mexican Percent participating
View/Photograph Natural Scenery	67.3		42.1		47.3
Visit Nature Centers, etc.	60.6		49.8		53.1
Sightseeing	5.7		27.9		35.0
View/Photograph Other Wildlife	52.4		24.3		28.3
Visit Historic Sites	50.8		25.0		37.3
View/Photograph Wildflowers, Trees, etc	50.1		30.9		37.0
Visit a wilderness or primitive area	37.6		21.2		22.3
View/Photograph Birds	37.1		18.3		23.1
Gather Mushrooms, Berries, etc.	33.3		18.1		18.6
View/Photograph Fish	27.4		15.0		19.9
Boat Tours or excursions	22.1		8.2		13.4
Visit Prehistoric/Archeological Sites	21.5	15.9		21.6	
Caving	5.2		3.2		1.4

Midwestern Metropolitan Residents' Participation in Nature-based Outdoor Tourism Activities

Four out of every five residents now live in a metropolitan area. At the time of the 2000 Census this meant that almost 226 million of the Nation's 281 million residents (80 %) were living in one of the 276 U.S. metropolitan areas, up from 77 percent in 1980. Of the largest metro areas in the country, two are in the West, Los Angeles and San Francisco-Oakland, and two are in the Mid-West, Dallas-Fort Worth and Houston. Of the metro areas across the country, Dallas-Fort Worth has been one of the fastest growing at 29 percent growth since 1990. In Houston less than one-half the population is non-Hispanic white (48 %). The numbers in the column under each metro area name is the ratio of the percentage of people in each western metro area who participate in an individual activity divided by the overall percentage participating across the eight western metro areas combined. Converting the data to ratios more readily demonstrates which activities and which metro areas have larger or smaller percentages of people participating. Especially noteworthy are ratios larger than 1.5 (indicating much higher percentages of a particular metro area population participating) and ratios less than 0.7 (indicating a much lower participation rate). The actual metro participation percentage for each activity is shown in parentheses below each respective ratio. Warm water fishing stands out as a popular activity in the Dallas area.

Table 2. Participation ratios for nature-based outdoor tourism activities by metropolitan area and U.S. population overall, 2000-2004.

Activity	Dallas/ Fort Worth	Houston	U.S.Total
Picnicking	0.85	0.91	54.2
	(46)	(49)	
View/ Photograph Other wildlife	0.99	0.93	45.2
	(40)	(38)	
Swimming in Lakes, streams etc.	0.84	1.00	42.0
	(33)	(40)	
Day Hiking	0.58	0.62	32.6
	(24)	(26)	
Visit a Wilderness or Primitive area	0.71	0.76	32.6
	(24)	(26)	
View/Photograph Birds	0.95	0.87	32.5
	(28)	(25)	
Developed Camping	0.82	0.64	26.7
	(24)	(19)	
Warmwater Fishing	1.68	1.25	22.4
	(25)	(18)	

Hiking

According to the National Survey of Recreation and the Environment (NSRE) over 69 million Americans participate in hiking each year while over 173 million walk for exercise or pleasure (Table 3.). Hiking is a fundamental outdoor activity on which many others are based. Enthusiasts regard hiking as the best way to see nature. Hikers often seek beautiful natural environments in which to hike and, like other forms of recreation, hiking can have an impact on the environment.

Day hiking is the ninth most popular recreation activity in the United States according to the Sporting Goods Manufacturers Association (SGMA). There are over 200,000 miles of trails in the United States, with more being added all the time. Well-managed trails running through neighborhoods and communities can foster sustainable economic

activity through business development and tourism. In addition trails offer exercise and an opportunity to get back to nature and escape the pressures of modern life.

Mountain Biking

Over 40 million people participate in mountain biking while over 125 million people bicycle for pleasure. The International Mountain Bicycling Association (IMBA) has published Managing Mountain Biking (Pete Weber, ed). The book gives a good overview of what mountain bikers are looking for in a trail system as well as information on planning and designing trails, managing partners and volunteers and user conflicts. Mountain bikers want to connect with nature, they are looking for fun, challenge, exercise, a variety of trails offering different levels of difficulty and connections with other trails or routes. They also look for camaraderie, a sense of belonging, and basic facilities at trailheads such as information kiosks, bathrooms, camping, or bike washing areas.

The Outdoor Industry Foundation states that nearly 40 million people participate in mountain biking each year. Participation in mountain biking peaked in 2001 and participation has remained steady ever since. Participation in mountain biking is about half the participation in hiking. Additional information on U.S. bicycling statistics can be found at Bikes Belong coalition (www.bikesbelong.org), Sporting Goods Manufacturers Association (www.sgma.com), National Bicycle Dealers Association (www.nbda.com), and the National Survey of Recreation and the Environment (www.srs.fs.usda.gov).

As with most trail users, mountain bikers are looking for a connection to nature and escape from noise and stress often found in an urban setting. Physical exercise is another benefit of mountain biking. Trails should be provided for various levels of expertise. For some, mountain biking provides an opportunity to spend time with friends and family.

Horseback Riding

Nationwide, approximately 20 million people engage in horseback riding. Like most trail users, horse riders are looking for trails that are safe for their horses and their family as well as an opportunity to enjoy the beauty of nature. Stream crossings should be hardened as horses have an inherent fear of bogging. Bridges should be designed, constructed, and maintained to be structurally sound and have minimal movement when under the stress of one or more horses at the walking gait. Bridge decks should have non skid surfaces as horses are likely to slip on wet surfaces. Bridge railings should be sound and secure and extend 54 inches above the bridge deck. The tread should be firm and the minimum tread width for a horse trail should be 3 feet; it may be substantially greater depending upon construction processes and materials used at sites needing special treatment such as low water and bog crossings. Parking areas at horse trailheads need to be large enough to accommodate trucks and trailers and leave adequate room for safely loading and unloading stock. In most cases separate parking

areas for horses will reduce user conflicts and result in positive recreation experiences for all visitors.

For many, Dallas, Texas, brings to mind historic images of the old west. Horseback riding trails should capitalize upon those images carrying the theme of the old west in interpretive messages along the trail, in brochures, and at websites.

Nature Trails or Wildlife Viewing Trails

According to the National Survey on Recreation and the Environment (NSRE) over 118 million participate in visiting nature trails, nature centers or zoos. Nature trails or wildlife viewing trails may focus on birding or other wildlife depending on what is found in the habitat surrounding the trail. Interpretive information should offer tips on what to look for and seasons when various wildlife may be more readily seen. Planting of appropriate vegetation for wildlife food source, or cover, will encourage more opportunities for sighting wildlife.

Texas Tech University (Schmidly, David J., Nick C. Parker and Robert J. Baker, 2001) completed a survey of public attitudes towards natural resources; it showed that Texans strongly value natural resources and opportunities to participate in outdoor recreation. This study provides valuable information that can be used in determining the public's demand for various outdoor recreation opportunities and to gauge the value placed on outdoor recreation opportunities. It also gives useful information on the supply of outdoor recreation in Texas. The study found 97 percent of Texans felt it was important to know that wildlife exists in Texas while 98 percent of the general population felt that is was important that people have the opportunity to visit state parks in Texas. The objectives of the study were: to garner expert opinion and public attitudes in the state about conservation and outdoor recreation, to assess the state's holdings in public lands and cultural sites, to analyze the distribution of those holdings with regard to current and projected population and demographics, to predict the state's future needs for parks, natural areas, recreational opportunities, and cultural and historical sites, and to suggest ways that Texas and the Texas Parks and Wildlife Department could better prepare to meet future needs and demands on the state's natural and cultural resources.

Some of the key findings for the Texas Tech study (2001) are listed below. There are several implications for the Great Trinity Forest. First, outdoor recreation opportunities are in great demand. Second, the supply of outdoor recreation opportunities is low especially in urban areas in Texas. And lastly, Texans value outdoor recreation opportunities very highly and feel that providing habitat for wildlife is extremely important.

- The increasing need for outdoor recreation opportunities and for conserving natural resources in Texas requires a comprehensive solution.

- Texans have strong opinions about recreation and conservation issues, based on their love of the outdoors and their belief in the importance of protecting natural resources.
- There is strong support among the citizens of Texas for the mission of Texas Parks and Wildlife.
- Local and state parks are in short supply, given the size and population of Texas.
- Private landowners must be an integral part of conservation efforts in Texas, but they cannot meet the state's total outdoor recreational needs.
- Differences in interests and opinions among ethnic and gender groups with regard to conservation and recreation issues indicate the need for diversity in planning programs.
- Habitat conservation and restoration efforts have not been conducted on a scale large enough to preserve biologically sustainable habitats in all of the ecoregions of Texas.
- Conservation and heritage education, particularly for young Texans, is vital to the future.

Recommendations from the study include: the need for a statewide master plan to guide conservation programs, water conservation, addressing access needs of urban Texans for outdoor recreation opportunities, addressing ethnic diversity, targeting education, improving local parks, providing state parks, protecting ecoregions, and building partnerships. In improving local parks it was recommended that local governments and organizations should receive assistance in achieving the goal of 25 acres per 1,000 people for state parks in Texas. Texas is unusual in its relative lack of public lands. During its brief time as a republic, Texas sold the bulk of its public lands in order to finance a government. As a result, despite its vast size, the state owns relatively few public spaces in proportion to its population. More than 94 percent of the state's land remains in private hands, as does the destiny of many native plants and animals. Those who don't own land depend on public parks. However, areas of parkland, wildlife refuges, and forests make up less than three percent of the state. Less than one percent of land in the state is managed by Texas Parks and Wildlife.

Outdoor recreation needs in Texas are changing as the population becomes increasingly diverse and grows older; Texas A&M's Texas Outdoors a Vision for the Future (1998) indicates that older adults and minorities choose to participate in traditional Texas Parks and Wildlife Division (TPWD) programs and services, such as visiting state parks and recreational fishing, at lower levels than other population groups. In addition, the population in now predominantly urban; more than 80 percent of all Texans live in urban areas and approximately half live in four major population centers including Dallas, Fort Worth, Houston and San Antonio. Access to outdoor recreation opportunities is becoming more limited. State parks and wildlife management areas were examined to determine if additional infrastructure was needed or if other agencies were better suited to manage certain areas. Criteria for determining priority areas

included: proximity to urban population centers, natural resource value, recreational value, ability to expand, current size of state park, and destinations. State Parks, like Cedar Hill, operate at capacity for much of the year, but there are few opportunities to expand these sites. These priority sites represent opportunities for reaching large numbers of people and likely need additional educational or interpretive staff and programming to improve the visitor experience. Eagle Mountain Lake, just north of Fort Worth, was noted in the plan as eligible for transfer to private ownership Criteria used by TPWD to determine if a wildlife management area was eligible for transfer included: adjacent to other conservation organization lands, size too small for appropriate research and demonstration, and an isolated site that may be more appropriately managed by other conservation organizations.

The Outdoor Recreation Analysis portion of the A&M study (1998) notes that new state parks should be accessible to major population centers. Fifty-nine percent of day-use visitor's travel two hours or less to visit a state park while those staying overnight, or 66 percent, travel more. Most large wildlife management areas and state parks are located far from the major population centers. Seventy-five percent of the population of Texas lives within 60 miles of the I-35/I-45/I-10 corridors and Lower Rio Grande Valley whereas only 27 percent of the available TPWD acres are located within these areas. The U.S. Census Bureau projects that these areas will experience rapid growth over the next ten years. Almost all Texans believe that it is important to have the opportunity to visit a state park. The majority of Texans say they are willing to pay for more public access and natural resources conservation.

Picnicking and Outdoor Gathering

According to the National Survey on Recreation and the Environment, about 115 million people participate in picnicking. Picnicking and opportunities for outdoor gatherings of family and friends were identified as some of the more popular activities engaged in by families. Grouping of picnic tables or picnic shelters with amenities for cooking outdoors, and sanitary facilities, could be provided within the Great Trinity Forest.

Camping

Participation in camping ranges from about 52 million engaging in developed camping to about 32 million participating in primitive camping. Developed camping areas offer amenities such as water, flush toilets or other sanitary facilities, garbage pickup, electricity and sewer hookups. Primitive camping offers limited facilities such as vault toilets and may require campers to follow a "pack-it-in and pack-it-out" message for dealing with trash. Many of today's campers prefer more of the amenities they already enjoy at home such as satellite TV and internet access. However, there is still a segment that will seek out primitive experiences; Boy Scouts and other groups enjoy learning primitive skills associated with camping. The benefits of primitive camping for youth include the obvious physical and mental health benefits as well as instilling confidence and learning to work together with others.

Tent camping is the seventh most popular recreation activity of the U.S. Population, aged 6 and older, according to the Sporting Goods Manufacturers Association(SGMA). The popularity of camping has grown throughout the 1980's, 1990's and now 2000's. The expenditures on camping and hiking together are a $1.7 billion dollar industry in the United States; camping and hiking apparel add an additional $259 million in sales annually. Camping could be provided within the Great Trinity Forest.

Fishing

About 47 million participate in warm water fishing according to the NSRE. Fishing is an extremely popular activity and the experiences range from ocean fishing to "put and take" fishing in small ponds. There may be opportunities for river fishing along the Trinity River. The publics' need for information in order to enjoy fishing opportunities may be as simple as providing access to the river, information on fishing licenses or providing fishing platforms or piers.

Long-Term Trends in Recreation Participation

Many factors influence recreation behavior including demographic factors such as age, race or ethnicity, sex, wealth or income, education, and previous experience. According to Cordell et al (2004), the major factors that will influence recreation behavior during the next half-century relate to increases in population and real income. Average income is expected to grow 88 percent through 2050 while population increases will range from a low of 30 percent in the North to a high of 60 percent along the Pacific Coast. Population, age, and sex ratios are expected to change little while the percentage of whites in the population should decline somewhat as other racial groups grow at faster rates.

Supply factors, such as proximity and availability of recreation resources, are important in determining whether, and to what degree, individuals recreate. The amount of outdoor recreation opportunities available affects the choice and intensity of participation. As we have seen, the supply of outdoor recreation opportunities in Texas is very low, particularly near urban areas. The Great Trinity Forest has an opportunity to provide much needed trails for hiking, bicycling, horseback riding, and wildlife viewing.

The following table summarizes participation rates in activities that are, or could be provided, in the Great Trinity Forest:

Table 3. National Survey on Recreation and the Environment, outdoor recreation participation in the United States, 2000.

Activity	Percent	Number in Millions
Bicycling for fun or exercise	80.8	126.2
Bicycling on back-country, trails or cross country, riding a mountain bike	20.9	43.3

Horseback riding	9.8	20.3
Horseback riding on trails, back roads or cross country	8.0	16.6
Picknicking	55.2	114.4
Outdoor gathering of family or friends away from home	73.3	152
Visit an outdoor nature center, nature trail, visitor center or zoo	57.1	118.4
Visit prehistoric structures or Archeological sites	20.6	42.7
Visit historic sites, buildings or monuments	46.7	96.8
Walking for exercise or pleasure	83.8	173.7
Day hiking	33.4	69.2
Backpacking on trails or cross country	10.8	22.4
Camp at developed sites with facilities such as tables and toilets	25.4	52.7
Camp at a primitive site without facilities	15.4	31.9
Visit a wilderness or other primitive roadless area	33.2	68.8
Gather mushrooms, berries, firewood or other natural products	27.4	56.8
View, identify, or photograph birds	33.3	69.0
View, identify, or photograph wildlife besides birds for example deer, bears, snakes, butterflies, turtles	41.9	86.9
View, identify, or photograph salt or freshwater fish	23.4	48.5
View, identify, or photograph wildflowers, trees or other natural vegetation	42.5	88.1
View or photograph natural scenery	55.1	114.2
Go hunting	11.0	22.8
Hunt big game	8.2	17.0
Hunt small game	7.0	14.5

Hunt waterfowl such as ducks or geese	2.3		4.8
Sightseeing or driving for pleasure or driving ATVs or motorcycles	63.1		130.8
Go sightseeing	53.8		111.5
Drive for pleasure on country roads or in a park, forest, or other natural setting	53.4		110.7
Drive off-road for recreation using a 4-wheel drive, ATV, or motorcycle	17.5		36.3
Go fishing, either fresh or saltwater	34.2		70.9
Go fishing in warm water rivers, lakes, or streams for bass, bream, catfish, pike, walleye, crappie, or perch		22.9	47.5
Go sailing, motor boating, water skiing, jet skiing, canoeing, kayaking, rafting, tubing, surfing, sailboarding or any other form of boating	36.7		76.1
Go sailing	5.1		10.6
Go canoeing	9.5		19.7
Go kayaking	3.2		6.6
Go rowing	4.4		9.1
Go motorboating	24.4		50.6
Go waterskiing	8.2		17.0
Go boating using personal watercraft such as jet skis, wave runners, etc.	9.5		19.7
Go rafting or tubing, or any other type of floating on rivers or other flowing water	9.7		20.1
Go swimming, snorkeling, scuba diving or visit a beach or other waterside area	60.1		124.6
Go swimming in streams, lakes, ponds or the ocean	43.8		90.8
Visit a waterside other than a beach for recreation	27.1		56.2

Trends in activity participation since 1999 are addressed in a recreation statistics update from the NSRE. In recent years our population has grown at a fast pace, from about 281 million in 2000 to 288 million in 2002, and reaching almost 295 million in 2004. Activities range from highest overall percentage of the population participating (walking

at 82.5 %) to the lowest (windsurfing at 0.8 %). Topping the lists for all time periods are walking, outdoor family gatherings, gardening, viewing /photographing natural scenery, visiting nature centers, and bicycling. Across the years there seem to be two general trends. First, the percentage of the population participating in many activities increased between the fall of 1999 and the spring of 2004. For example, visiting nature centers went from 53 percent in late 1999 to almost 57 percent in 2004. The second general trend is that, for many activities, participation percentages dipped from fall 2001 to summer 2002, probably in reaction to the September 11, 2001 tragedies. Overall, however, outdoor recreation participation has increased over the five time periods covered (NSRE Recreation Statistics Update, September 2004).

Some general NSRE results are given in NSRE, Chapter 2: Participation & Trends in Outdoor Recreation. Over 97 percent of Americans participate in outdoor recreation activities. Walking, birding, hiking, and swimming are the fastest growing activities. Most participants are trying a greater number of activities. Participation has increased in almost all outdoor recreation activities since 1990. Almost all outdoor activities are forecast to grow in number of people participating. People are living longer and staying active longer. Increasingly, minorities, senior citizens, and urban dwellers are participating. College-educated individuals with incomes over $50,000 and with smaller households are a major growing demographic. Outdoor recreation is expected to continue to expand in the future, placing more demands on water and land resources.

The most popular outdoor activities (NSRE, Chapter 2: Participation & Trends in Outdoor Recreation) may be popular because they are low cost, require minimal physical exertion, and can be enjoyed without specialized equipment or skills.

Table 4. The Most Popular Types of Outdoor Participation.

Activity	% of Population Participating	Millions of Participants
Individual Trail/ Street/Road Activities	88.3	188.2
Traditional Social Activities	80.6	171.8
Viewing & Photographing Activities	73.9	157.5
Viewing & Learning Activities	67.3	143.4
Driving for Pleasure Activities	61.5	131.1
Swimming Activities	61.3	130.6

Table 5. The Most Popular Overall Activities.

Activity	Percent of U.S. Population Participating
Walking	82.3
Family Gathering	73.8
Viewing Natural Scenery	59.5
Visiting a Nature Center, Nature Trail or Zoo	56.6
Picnicking	54.6

Viewing natural scenery and visiting a nature center, nature trail, or zoo are activities that overlap with tourism and outdoor recreation. Since NSRE first started tracking outdoor recreation activities, swimming has increased most significantly. Hunting has shown the smallest growth since 1960, yet all activities show increases in people participating.

The information provided above demonstrates the demand for outdoor recreation opportunities especially near urban Dallas. People are looking for outdoor family-oriented opportunities for exercise, getting in touch with nature and enjoying time with family.

Conclusions

The information provided above demonstrates the high demand for outdoor recreation opportunities especially near urban Dallas. People are looking for outdoor family-oriented opportunities for exercise, getting in touch with nature, and enjoying time with

family. The demographic characteristics of Texan's are changing as the general population ages and Hispanics make up a larger proportion of the total population. Opportunities exist to reach out to traditionally underserved groups including the seniors, urban youth and Hispanics. The number one reason for not participating in outdoor recreation is "lack of time." The location of the Great Trinity Forest, within minutes of downtown Dallas, is ideal and will allow residents to use trails frequently, if not daily.

UNIQUE ATTRIBUTES OF THE GREAT TRINITY FOREST

One of the most unique and marketable characteristics of the Trinity Forest is its proximity to the people of Dallas, Texas. Within a few minutes drive urban residents can enjoy hiking, biking, horseback riding, wildlife viewing and photography and other trail related activities in a forested natural setting. In addition opportunities exist for fishing along the river. Camping opportunities provided at the Great Trinity Forest would offer unprecedented opportunities for local urban youth to experience the great outdoors without venturing too far from home. The Great Trinity Forest is unique in its proximity to Dallas and unique in the forested environment it provides. Topography is limited as the area is relatively flat; this may provide challenges regarding trail maintenance. The mild climate provides an opportunity for year-round activities. The recreation facilities including trails, camping, fishing and picnicking will provide unique settings for interpreting the diversity of tree species, understory vegetation, flowering plants, and wildlife habitats found within the Great Trinity Forest.

Location

The urban population located a few minutes from the forest is anxiously awaiting the outdoor recreation opportunities that the Great Trinity Forest can provide. Visitors will not have to travel far to enjoy an escape from the traffic and noise found in most urban areas. With increases in gas prices, more people are choosing to recreate close to home. Opportunities for solitude and spiritual renewal are often limited for urban dwellers. The Great Trinity Forest is unique in that it has a captive audience that is ready and eager for outdoor recreation in a forested environment. The demand for outdoor recreation is extremely high due to the sheer number of people that live within the Dallas metroplex.

Trails

The hiking, bicycling, horseback riding trails, as well as the wildlife viewing trails that will be provided at the Great Trinity Forest will provide a unique opportunity for visitors to engage in healthful exercise as well as quality family outings. Trails offer numerous benefits, both to the user and to the community. Trails make communities more liveable; businesses are more likely to locate in communities with a high quality of life. Trails offer opportunities for communities to improve health and fitness. Trails can benefit the local economy through sales of trail related equipment or through tourism including restaurants, hotels, and gas stations. Trails restore or preserve open space for future generations. Trails provide an opportunity for exercise and the physical health benefits, as well as the spiritual benefits, of trails are many. Outdoor recreation provides an escape from stress and noise of the urban environment.

A quick look at demographic statistics shows that the population of the United States is getting older. According to the U.S. Department of Health and Human Services American over age 65 are the least active age group (www.healthierUS.gov). Approximately 35 percent of those aged 65-74 years and 46 percent of those aged 75 or

older report no leisure time physical activity at all. Most seniors (80%) have at least one chronic condition and 50 percent have at least two. Trails, especially accessible trails, can offer seniors an exercise opportunity where no special skills or equipment are required.

Trails offer an opportunity for all members of the community to improve their health and well being. Trails for Health is a Centers for Disease Control and Prevention (CDC) initiative to help Americans of all ages achieve the health benefits of physical activity by increasing opportunities for physical activity and helping to make it an integral part of community life. "Trails for Health" supports the Department of Health and Human Services' *Steps to a Healthier US* initiative, which promotes behavior changes and encourages healthy lifestyle choices. Significant benefits of physical activity include: weight control, high blood pressure control, reduced risk for diabetes, heart attack and colon cancer, reducing symptoms of depression and anxiety, reducing arthritis pain and preventing osteoporosis and falls. The CDC provides information and technical assistance to states to promote the connection between trails and health (www.cdc.gov/nccdphp/dnpa).

Healthy Trails, Healthy People is the theme of National Trails Day, sponsored by the American Hiking Society (www.americanhiking.org). It is a nationwide celebration of trails, held every year on the first Saturday in June, and features more than 2,000 events hosted by trail clubs, conservation organization, agencies, and businesses. Trail events should be planned at the Great Trinity Forest to celebrate National Trails Day.

Water-Based Recreation Opportunities

The Great Trinity River itself provides opportunities for water-based recreation including fishing from the bank of the river. In addition, opportunities for water viewing may be presented along trails where the opportunity occurs. Water views are a unique feature of the area and one that will be in great demand by visitors. Water attracts wildlife and migratory birds thus improving wildlife viewing opportunities.

Climate

The mild climate of the Dallas area results in a year-round opportunity to enjoy the trails and forested environment. Seasonal events will be popular and can range from spring hikes to summer wildflower or butterfly viewing, and from fall fishing events for children, to winter wildlife watching opportunities.

Forested Landscape

The hardwood forest, with a variety of mast producing trees, will attract a diverse array of wildlife species. Opportunities for wildlife viewing and photography are numerous. Interpretation opportunities regarding the various wildlife habitats and wildlife forage species provided offer unique opportunities for children and their families to learn the importance of providing a diversity of habitat for wildlife. The variety of wildlife forage

provided also offers opportunities for species identification. The variety of trails that will be provided offers opportunities for a number of interpretive themes.

STRATEGY FOR PROVIDING OUTDOOR RECREATION OPPORTUNITIES

An integral part of the strategy for providing outdoor recreation opportunities on the Great Trinity Forest is the completion of a marketing plan. In short, a marketing plan outlines the goal or the mission and objectives, identifies the target markets or customer base, and describes the niche or unique products and services that the Great Trinity Forest can offer. Finally, the plan focuses on a strategy for delivering the products and services to the customer. It is important to have an understanding of marketing as it provides a framework for providing a sustainable outdoor recreation program.

Marketing is the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational objectives (Shaw, Roy T., and Richard J. Semenik, 1989). Marketing can apply to ideas and services as well as to physical products and to nonprofit organizations as well as profit-making firms. The marketing concept has three basic elements: (1) Customer orientation which requires knowledge of customer's needs, (2) Integrated effort in the organization with emphasis placed on having the entire organization work to provide and enhance customer satisfaction, and (3) profit reward where focus is placed on profit rather than sales volume and the concept that if the organization does a good job customer loyalty, repeat business, and favorable attitudes will be developed. Peter F. Drucker expressed it well when he stated "the aim of marketing is to make selling superfluous…to know and understand the customer so well that the product or service fits him and sells itself. Ideally, marketing should result in a customer who is ready to buy…"

Although the City of Dallas is not a profit oriented institution, they do want to use their limited resources wisely. By concentrating their efforts on outdoor recreation opportunities that are in demand by the public and that the City of Dallas is uniquely well-suited to supply, the City focuses on their niche. This strategy is more efficient than trying to be everything to everyone. The niche for the Great Trinity Forest will be to provide family oriented opportunities for healthful outdoor recreation activities through a system of looped trails with interpretive themes, and camping facilities, in a forested environment within minutes of downtown Dallas. The area will provide a safe environment for students and nature lovers of all ages to learn about and enjoy their forest. Visitors to the Dallas area will be delighted to be able to hike, bicycle, and ride horses on an expansive trail system within minutes of downtown Dallas.

Marketing is a major activity in any economy but most importantly responsible marketing contributes to human welfare (Shaw, Roy T., and Richard J. Semenik, 1989). As populations continue to expand and production costs increase it becomes ever more important to match available goods and consumer needs more effectively. A marketing program is a planned process to accomplish the following: (1) produce goods and services where and when they are needed and wanted in proper quantities and

qualities, (2) provide goods and services at fair prices – that is at prices that cover long-run costs of producing and distributing them, (3) assure fair dealings in all transactions, and (4) provide adequate information from consumers to the marketing entities and from the marketers to consumers to enhance wise producer and buyer decision making.

For long-term success, those involve in marketing must plan their present and future strategies. This must be done in the face of constant changes, as well as in the light of present conditions. An understanding of the environments within which the organization functions is essential in a marketer's planning process; an analysis of opportunities and threats is used to monitor changes in several environments such as the changing demographics of a local population (Shaw, Roy T., and Richard J. Semenik, 1989).

Every time and place offers new opportunities for marketing. Some emerging marketing opportunities include: growth in the experiential industries, wellness, and the rising importance of convenience or specialization to consumers. Toffler (1980) in his book, The Third Wave, predicted the rise of the experiential industries including both simulated and live environments. Simulated environments offer a taste of adventure without risk while live environments involve an element of risk such as safaris, gambling casinos and travel. Shopping malls have capitalized on simulated experiences offering ice skating rinks in warm weather areas. Hotels and resorts have also capitalized on simulated experiences offering backdrops of Paris or Venice or sponsoring activities such as "murder mystery week." Experiencing real environments are also being marketed such as participating in major league baseball camps, cattle drives, and Mt. Everest climbs. Travel is a major component of the experiential industry and has become an essential component of the American lifestyle. Eco-tourism is another future direction for the travel industry. Another popular marketing opportunity for parks is wellness. Wellness incorporates quality of life concerns related to all phases of existence including: physical, spiritual, intellectual, occupational, and emotional wellness. Outdoor recreation providers of trail systems can capitalize on wellness by offering basic biking or hiking workshops to improve skills; these events can be paired with a group ride or hike. Interpretive events at trailheads can allow families and children to experience hands-on viewing of wildlife including snakes or insects; this can be coupled with a safety message regarding wildlife.

Both external and internal environments influence the planning and execution of marketing activities. External environments include: demographic dimensions, economic environment, cultural environment, technological environment, political-legal environment, and competitive environment. An analysis of external environments helps identify market opportunities or threats. Internal environments include: corporate culture, leadership abilities, product capability, marketing capability, financial means and location. Analysis of internal environments helps identify strengths and weaknesses of the organization. A marketing planning guide shows how all of these are used to develop and implement marketing strategies.

Demographics or demographic data refers to selected population characteristics often used in marketing (Shaw, Roy T., and Richard J. Semenik, 1989). Demographics of a population include: how many, where they live, the age distribution, family formation and non-family households. All of these factors influence the amount and kinds of consumer goods demanded. The Dallas population is somewhat younger and more ethnically diverse that the rest of Texas. Signing, brochures, and other communication must include Spanish language versions; were possible universal signing should be used. By gearing activities and events to families with young children and offering programs, brochures, signing, and other materials in both English and Spanish the Great Trinity Forest will successfully reach the young, ethnically diverse, Dallas audience.

Economic trends can have a profound influence on the types of good or services demanded. When disposable income shrinks a larger portion of family income goes toward the purchase of food and other basic household expenses. The recent increase in gas prices makes the idea of vacationing close to home very attractive and this is a message that the Great Trinity Forest could capitalize upon. Those families with less disposable income may choose to recreate close to home to save money. Those with more disposable income may also choose to recreate close to home but for different reasons; they will recreate close to home because it is a “greener” choice as it reduces use of non-renewable resources.

The cultural environment also influences consumer behavior. Changing cultural values including attitudes toward institutions such as home, church, and education can and do change. Religious services within the forest could be encouraged or welcomed. Concerts featuring gospel or other family oriented venues are ideas to consider.

Technological developments are important in marketing. First, because product availability affects the way people live and how and what they buy, and secondly, because of their effects on the organizations, institutions and methods of marketing.

Marketing demand is sometimes a function of geography or the physical environment as suppliers in cities closer to ski areas sell more ski equipment.

Government policies, laws, and regulations that affect the marketplace are those that influence the economy and purchasing power of individuals, those that affect competition, those designed for consumer protection, and those that enhance, restrict or regulate access to and use of society’s collective goods, especially the natural environment.

The competitive environment includes both direct and indirect competition. Direct competitors offer another product that meets the same general needs as yours. Indirect competition occurs among sellers of different products, for instance, a family may decide to purchase a new carpet instead of a new car. It is frequently beneficial to

obtain information on each competitor in the following areas: financial strength; production capacity; and the competitor's marketing strategy and tactics, including price, promotion, logistical services, and the general pattern of the competition's market behavior (Shaw, Roy T., and Richard J. Semenik, 1989).

A complete planning process involves defining the basic purpose and objectives of the organization, establishing policies, formulating strategy, developing tactics to implement policies, and creating a provision for monitoring results and making adjustments to keep on track. Objectives are the values the organization seeks to satisfy, the purpose, or the organization's mission. Every organization was established to do something but, unfortunately, many managers lose sight of that basic reason for being.

An analysis for strategy development should consider both external and internal environments and market planning including: identifying the target market, the target's objectives, and the target's alternative choice for fulfilling his objective. Marketing strategies for growth are focused on three categories: intensification, integration, and diversification. Intensification means selling more of your present product or by slightly modifying your product. Integration means extending ownership vertically or horizontally. An example of horizontal integration would be the purchase of additional operations on the same level such as multiple unit chain stores. An example of vertical integration would occur when a retailer purchases a wholesale or manufacturing facility. Diversification means adding products to the present lines and can take one of three forms. First, a producer can diversify by adding products that are technologically compatible with the present product. Secondly, one can diversify by adding products that appeal to present customers even though they are technologically unrelated. A third method of diversifying is adding unrelated products and promoting them to completely different groups (Shaw, Roy T., and Richard J. Semenik, 1989).

Tactics are the specific activities undertaken to assure success of the strategies. For example, a strategy may be to invest heavily in promotion, especially advertising.

A marketing planning guide provides an organized approach to planning the strategy and tactics that will be used. There are five general steps. First, identify the target market or the individuals, organizations or groups that can gain satisfaction from your product or service. Second, determine the objectives or the mission or goal of your firm or agency. Third, identify the alternative means available to customers in the target market to meet their desired objective. Fourth, decide which strategies to use. Lastly, determine which tactics will most nearly assure the success of the selected strategy.

The International Mountain Biking Association (IMBA) offers 12 marketing tips for mountain biking that can easily be expanded to other trail activities as well. First, build great trails and they will sell themselves. Second, provide for supporting facilities including picnic tables, garbage cans, map holders and some way to obtain comments or feedback from trail users. Third, use signing effectively; make it easy to find the trails

and mark the trails well. Fourth, share the local knowledge with trail staff that can act as ambassadors. Fifth, team up with local bicycle or other trail oriented shops. Sixth, get local businesses involved and build community support. Seventh, create a great website. Eighth, offer free trail maps. Ninth, tell great stories in the local media. Tenth, photograph the trails professionally. Eleventh, develop a region-wide destination. And lastly, track use and the impact on local community including sales tax, lodging, and traffic.

MARKETING PLAN FOR THE GREAT TRINITY FOREST

The following is a Marketing Plan for the Great Trinity Forest. This Plan will change over time as internal and external conditions change and as the objectives or mission and goal become more well-defined.

The word marketing conjures up different meanings to different people. Many people think of advertising and high-pressure sales pitches. While advertising is important to marketing it is much more than this. Kotler defines marketing as human activity directed towards satisfying needs and wants through exchange processes (Kotler, 1980). The process of marketing consists of a host of activities designed to identify the needs and wants of potential consumers and to encourage those individuals to become involved in the exchange process. With many goods and services this exchange process involves purchase or payment. With parks, recreation and leisure service the exchange process may be to encourage potential users to exchange discretionary time and money in traveling to the site for participation in a recreation program or service. Successful marketing focuses on the customer or user. Investigating and understanding the needs and wants of users results in being able to provide the outdoor recreation opportunity that is desired. Recreation consumption expenditures are big business. A recent study by the Roper Organization ("USA Snapshots", 1990) indicated that when people are asked to assess the importance of leisure and work in their lives, increasing numbers of Americans rank leisure as more important than work. Yet while people view recreation and leisure as pleasurable and attractive the physical fitness levels of Americans indicates many are not participating in outdoor recreation activities; through marketing it is possible to target these individuals.

Objectives

The following objectives are recommended for the Great Trinity Forest:

- to offer the public access to the Trinity River through a series of looped trails for hikers, bicycles, and horses;
- to encourage a variety of safe and healthful outdoor recreation opportunities for families;
- to foster an appreciation of the natural environment through education and interpretation;
- to offer a diversity of trails through various habitats and ecosystems found in the Great Trinity Forest.

By offering looped trails and a diversity of trail use options the Great Trinity Forest will address the needs of a wide variety of users. Looped trail systems allow placement of easier trails near trailheads and more difficult trails at a distance from trailheads. Looped trails provide the user with the opportunity to choose how long they want to be out on the trail. Looped trails also offer the choice of a different trail experience for each visit. Looped systems allow the user to return to the trailhead, where they began,

rather than retracing their steps. The spine trail will offer a long-distance experience and will allow for access for maintenance and for safety.

The overwhelming recreational benefit from the Great Trinity Forest will be offering safe and healthful outdoor recreation opportunities. Opportunities for healthy exercise are in great demand. And just about everyone can benefit from escaping the pressures of work. The safety and enjoyment of all family members will be a primary concern of users and the safety of users should come first in all management decisions. Safety messages should be evident on all printed materials, at the website, and at all trailhead information kiosks.

The greatest draw of the Great Trinity Forest is the vast area of natural space. The forest management techniques that will be practiced will enhance the area over time and result in the greatest benefit to wildlife and, indirectly, to recreation users both now and in the future. These lands present a rare opportunity to interpret the natural environment within an urban setting. Engage volunteer groups, community groups, and local businesses to work together in preparing interpretive signs, brochures, and planning special or seasonal events.

By offering a diversity of trails through various habitats the management of the forest can be highlighted. The City of Dallas can be recognized for their insight in establishing a management plan that will serve the citizens now and in the future.

Market Environment Analysis

As we have seen above, a market analysis considers both internal and external environments. Demographics, economic condition, laws and government conditions, technology and competition can all be addressed. A common approach is to look at the strengths, weaknesses, opportunities and threats.

INTERNAL	**EXTERNAL**
Strengths	Opportunities
Weaknesses	Threats

By looking at the strengths of the agencies and opportunities available the core competencies are identified. This analysis framework is simple but requires good information.

The Strengths of the Great Trinity Forest include: a large land area close to downtown Dallas, a well-managed forest producing quality wildlife habitat, a series of looped trails offering diverse outdoor recreation opportunities, high demand for trails and a limited supply of opportunities in Dallas. Weaknesses might include: heavy demand for trail use may overtax parking or other facilities. Opportunities include: user groups, local community groups, and business owners will make excellent partners.

The following sections address general demand and trends for trails and camping.

Trails

Hiking trails most in demand will offer a 2-hour, or less, hiking opportunity on a looped trail that returns to the trailhead from which the hiker started. Accessible trails will be popular with seniors, families with small children, and those with temporary or permanent disabilities. Bicycle trails will attract a young, diverse audience; a variety of trails from beginner trails to challenging advanced will be in demand. Items most in demand by trail users include: maps, toilet facilities, and parking.

Each year Trails.com ranks the popularity of over 40,000 trails by collecting and analyzing over 10 million "votes" received from members and website visitors. The following lists notes the best trails in Texas:

- The Cross Timbers Trail — 35 miles NW of Sherman, TX
- The Anthills — at Terry Hershey Park in Houston, TX
- Trinity Trail — 25 miles NE of Dallas, TX
- The Four C Trail — Davy Crockett National Forest, Crockett, TX
- Grapevine Lake — 10 miles N of Dallas-Fort Worth Airport
- Lost Maples — 50 miles SW of Kerrville, TX

Only six trails are listed for Texas and none of these are within the city of Dallas.

An article by Wes Boyd (n.d.) titled Changing Trends in Backcountry Trail Use, contained on the American Trails website (www.americantrails.com), addresses the question of what Americans are looking for when they recreate on trails. Boyd notes that backcountry trail use has dropped over the last couple of decades. Fifty to sixty percent of trail use is less than 2 hours in duration and the first 900 feet of trails are often most heavily used. The mix of the American population is changing and aging. Boyd encourages managers to think of short term users as well as long-distance trail users. He notes that trail users generally want: a good map, a toilet, clear directional signing, parking, better trail tread and return loops.

Camping

Market conditions have a significant impact on a campground's profitability. Information collected can be used to predict future occupancy levels and rates. A market analysis will help in answering questions such as what trends are occurring in the campground industry, the strengths of local tourism, identifying competitors and their strengths and weaknesses, identifying the strengths and weaknesses of your location, and establishing the occupancy percentage and rates one can realistically achieve.

Looking at industry trends one can see that ownership of Recreational Vehicles (RV's) has reached record levels, according to a recent study by the University of Michigan (Curtin, 2005). Nearly 8 million U.S. households own at least one RV, a 15 percent

increase over the past four years and a 58 percent increase since 1980. One in 12 U.S. vehicle-owning households now own at least one RV. The study, funded by the Recreation Vehicle Industry Association (RVIA), noted the highest ownership rates are found in the 35 to 75 year old demographic group while the largest gain in ownership occurred among those less than 35 years of age. The Michigan study found that the typical RV owner was 49 years old, married, and a homeowner earning $68,000 per year.

A study of the recreational vehicle industry by Crowe Capital Markets LLC forecasted $13.7 billion in sales by 2005 and highlighted several important factors of the industry: (1) a large and rapidly growing market, (2) continued industry rebound, (3) favorable demographic trends, and (4) continued consolidation. After declines in shipments and total retail value in 2000 and 2001 the $8.6 billion RV market began to recover in 2002 and this trend is expected to continue. A market rebound is already under way as RV equities have outperformed the S&P index by a margin of 92 percent over the past two years. As baby boomers age, the RV industry stands to experience significant future growth through increased spending on the RV lifestyle. With more disposable income and free time, boomers represent the highest RV ownership rate (13.7 percent of vehicle owning households).

The Dallas-Fort Worth metroplex has many characteristics that would be ideal for location of an RV park. High population, good access, numerous tourist attractions, weather suited for year-round camping, excellent tourist infrastructure including roadways, restaurants, shopping, gas stations and automotive repair, and hospitals. Dallas has numerous cultural events throughout the year that draw tourists to the area. Many of these are nature-based such as wildflower viewing. Dallas has a large population base to draw local visitors. The state of Texas has the Texas Nature Tourism Association, the Texas Nature Tourism Information Center and the Texas Tourism Information Center all available to help with marketing and attracting tourists to the state.

By identifying the competition and learning about their strengths and weaknesses in delivering services to the target market businesses, the city can identify where they need to focus their resources. A partial listing of RV parks in the Dallas area is listed below along with amenities offered, prices, and contact information, where available. Dallas area competition for RV parks appears limited. Pricing of competitors indicates that any RV park with full hook-ups should be priced no less than $45.00 per site, per night.

Ownership	Name	City	Zip	No.Sites with Full Hookups	Fees
Private	Alvin Lafons RV Parks	McKinney	75069	70	$16

Private	Alvin Lafons RV Parks	Princeton	75407		Not available
Private	Arlington Place RV Park	Arlington	76001	15-20 sites	Not available
	City of Grand Prairie Lake Parks	Grand Prairie	75052		Not available
Private	Copeville RV Park LLC	Farmersville	75442		Not available
Private	Cowtown RV Park	Aledo	76008		$30
Private	Cowboy Acres	Waxahachie	75165		Not available
Private	Creek Front RV Resort & Tent Camping	Kemp	75143		Not available
Private	Dodge City rV Park	Alvarado	76009		Not available
	Eldorado RV & Marine	Princeton	75407		Not available
Private	Equestrian Ranch Camp	Dallas	75230		Not available
Private	Fort Worth Midtown RV Park	Fort Worth	76107		Not available
Private	Hidden Acres RV Park	Princeton	75407		Not available
Private	Jims RV	Lake Dallas	75065		Not available
Private	Marine Quest Hidden Cove Park Marina	The Colony	75034		Not available
Private	Pat's Court	Haltom City	76111		Not available
Private	Plantation Place RV Resort	Sunnyvale	75182	38	$28
Private	Pecan Acres Mobile Home & RV Park	Midlothian	76065		Not available
Private	Post Oak Place	Denton	76205		$26
Private	Sandy Lake RV Park	Carrollton	75006		Not available
Private	Dallas Hi Ho RV Park	Glenn Heights	75154	100	$25
Private	Traders Village Dallas	Grand Prairie	75052	152	$32
Private	Spring Creek Village	Plano	75074	181	Not available
Private	All Seasons OR Dallas Metro KOA	Arlington	76015	178	$45
Private	Loyd Park	Grand Prairie	75052	110	$25
TPWD	Cedar Hill State Park	Cedar Hill		355	Not available
USACE	Joe Pool Lake				Not available
Private	The Vineyards Campground on Lake Grapevine	Grapevine	76051	82	$35
Private	Treetops RV Village	Arlington	76015	165	$28
Private	Texas RV Ranch	Mansfield	76063	104	$28
USACE	East Fork Campground	Wylie	75098		$18
USACE	Clear Lake Campground	Wylie	75098		$18
USACE	Lavonia	Lavon	75166		$18
USACE	Hickory Creek	Lewisville	75057	134	Not available
	BARDWELL LAKE				Not available
USACE	Highview - Bardwell Lake	Ennis	75119		Not available
USACE	Little Mustang Day Use facility				Not available
USACE	Love - Day Use and camping				Not available
USACE	Mott Camping			40	Not available
USACE	Waxahachie Ck - Day Use and Camping				Not available
USACE	LAKE TEXOMA	Cartwright	74731		Not available
USACE	Cedar Bayou - Day Use and camping				Not available
USACE	Damsite Texas - Day Use and Camping			21	Not available

USACE	Flowing Wells - Day Use and Camping				Not available
USACE	Highpoint Day Use and Camping				Not available
USACE	Juniper Point Day Use and Camping				Not available
Private	Sunset RV Resort	Austin		37	$25
TPWD	Bonham State Park	Bonham	75418	14	$15
USACE	Liberty Hill Park			96	$20
USACE	Oak Park			48	$20
USACE	Pecan Point Park			5	$10
USACE	Wolf Creek Park			50	$14
USACE	Canyon Lake	Canyon Lake	76513		Not available
Private	7IL Trail	Cat Spring	78933		$15
	Almost the Wilderness	Adamsville			Not available
TPWD	Caprock Canyons State Park and Trailways	Quitaque	79255		Not available
TPWD	Choke Canyon State Park	Three Rivers	78071		Not available
TPWD	Cooper Lake State Park	Sulphur Springs	75482		Not available
TPWD	Copper Breaks State Park	Quanah	79252		Not available
	Hill Country State Natural Area	Bandera	78003		Not available
TPWD	Lake Arrowhead State Park	Wichita Falls	76310		Not available
TPWD	Lake Mineral Wells State Park and Trailway	Mineral Wells	76067		Not available
TPWD	Palo Duro Canyon state Park	Canyon	79015		Not available
TPWD	Ray Roberts Lake State park	Pilot Point	76258		Not available
TPWD	San Angelo State Park	San Angelo	76901		Not available
	Seahorse Ranch	Alvord	76225		Not available

Inventory of Existing Facilities

There a numerous city parks within Dallas as well as museums and a few state parks. However, there is nothing close to the Great Trinity Forest in terms of natural areas within a very short distance of the center of Dallas.

The following is a brief overview of outdoor oriented activities in the Dallas area. Information was obtained from web pages or other documents noting parks, trails, and other nature-based opportunities within the city and environs of Dallas.

Dallas City Parks offers a website www.dallasparks.org/Parks/parksmain/aspx and gives a general description of the 21,000 acres of parks, 17 lakes covering 4,400 surface acres, 17 park sites, 61 miles of jogging and bike trails at 24 locations. There is a list of all the city parks including: Fair Park, White Rock Lake, Arboretum, Cedar Ridge, Discovery Gardens, Hike and Bike Trails, Dallas Zoo, and Trinity Center.

Fair Park

Fair Park, site of the Dallas State Fair, has 9 museums and 6 performance facilities including the Music Hall, Smirnoff Music Center, Band Shell and the Cotton Bowl Stadium. It is a National Historic landmark and has the largest collection of Art Deco exposition style architecture in the United States.

The following history on the State Fair is from their website www.bigtex.com/aboutus/history . The Dallas State Fair & Exposition, to which the present State Fair of Texas traces its origin, was chartered as a private corporation on Jan. 30, 1886, by a group of Dallas businessmen including W.H. Gaston, John S. Armstrong and Thomas L. Marsalis. James B. Simpson was elected president of the association, and Sidney Smith was appointed as the first secretary.

Differences arose among the directors over where to build the new fairgrounds. Gaston proposed property in East Dallas, an 80-acre tract located within the modern boundaries of Fair Park. Strong opposition was voiced by C.A. Keating, speaking for the farm implement dealers. When no compromise could be reached, Keating and his supporters secured a charter for a separate event, the Texas State Fair & Exposition, which they announced would open just north of town on October 25, just one day ahead of the Dallas State Fair.

Exhibit facilities and a racetrack were built at each location, and both events attracted sizable crowds that fall. Attendance at the Dallas State Fair was estimated in excess of 100,000. But revenues for the fairs failed to meet expenses. The rival associations merged in 1887 becoming the Texas State Fair & Dallas Exposition. Despite indebtedness of more than $100,000, the directors voted to expand the fairgrounds by purchasing 37 acres adjacent to the East Dallas site.

The finest racing stock, cattle sales, concerts, balloon ascents, displays of farm machinery, contests for the ladies and appearances by such notables as John Philip Sousa, William Jennings Bryan, Carrie Nation and Booker T. Washington brought thousands of Texans to the Fair each year. But the popular success of the exposition was shadowed by repeated fires, mishaps and mounting debt. A grandstand collapsed during a fireworks show in 1900, and the main exhibit building burned to the ground two years later. When the Texas Legislature banned gambling on horse races in 1903, thereby eliminating the Fair's main source of income, the association faced a financial crisis. To protect this valuable community asset, the Texas State Fair spurned offers from developers and sold its property to the City of Dallas in 1904 under an agreement that set aside a period each fall to hold the annual exposition.

The reorganized State Fair of Texas prospered immediately, establishing new records for receipts and attendance as 300,000 people streamed through the gates in 1905. President William Howard Taft visited the Fair in 1909, and Woodrow Wilson delivered a speech in 1911. Automobile races and stunt flying exhibitions became the top attractions. Attendance topped the 1 million mark in 1916. World War I caused the 1918

State Fair to be canceled, and Fair Park was converted into a temporary army encampment.

The 1920s brought significant development and increased activity to the fairgrounds. A magnificent auditorium, which eventually would be known as the Music Hall, was completed in 1925, and outstanding New York shows were presented to Texas audiences for the first time. The Texas-OU football game was established as an annual fair time event in 1929. And in 1930, the race track complex was razed to permit construction of 46,000-seat Fair Park Stadium, later renamed the Cotton Bowl.

In 1934, largely through the efforts of civic leader R.L. Thornton, Fair Park was selected as the central exposition site for the proposed Texas Centennial celebration. No state fair was scheduled in 1935, and construction began on a $25 million project that transformed the existing fairgrounds into a masterpiece of art and imagination. The 1936 Texas Centennial Exposition attracted more than 6 million people during its six-month run. A similar but smaller-scaled event, the Pan American Exposition, was presented in 1937.

No fairs were held from 1942-1945. Following the end of World War II, under the leadership of R.L. Thornton, the State Fair of Texas entered an era of unprecedented growth. Attendance reached the 2 million visitor level in 1949.

Highlights of the 1950s included the development of an international livestock show, installation of a monorail system, a Cotton Bowl concert by Elvis Presley, a visit from Vice President Richard Nixon and the first appearance of Big Tex, a 52-foot cowboy figure erected in the center of the grounds.

Since 1960, each exposition has been keyed to a theme. In 1968, the total number of fairgoers exceeded 3 million for the first time. Major renovation of the Cotton Bowl and Music Hall was accomplished during the 12 years that Robert B. Cullum served as State Fair president.

Tragic midway accidents in 1979 and 1983 led to the adoption of a ride safety program that is considered a model for the amusement industry. Opening Saturday of 1985 was designated as "Eddie Robinson Day." The legendary coach of the Grambling University Tigers led his team to victory over Prairie View in the Cotton Bowl to become the winningest coach in college football. In 1986, Fair Park was designated a National Historic Landmark, and the State Fair of Texas hosted a 31-day exposition celebrating both the Texas Sesquicentennial and the Fair's own 100th anniversary.

As the Fair moved into its second century of operation, new leadership assumed command. In 1988, Errol W. McKoy was named president with responsibility for the organization's daily operation. The traditional fair season was extended from 17 to 24 days, and corporate sponsorship began to play an increasingly important role in

programming. Involvement by major companies made it possible for the State Fair of Texas to offer its visitors a range of exhibits, entertainment and services that are unmatched by any annual exposition in North America.

Texas Discovery Garden

The Texas Discovery Garden website (www.texasdiscoverygardens.org) gives a good overview of the garden located at historic Fair Park. The 7.5-acre garden of native and adapted plants is a year-round urban oasis. There are 10 different themed areas including a butterfly habitat, native wildlife pond, scent garden, shade garden and heirloom garden. It is the first certified organic public gardens in the state of Texas. It offers educational programs for students and youth groups. The plants are grown using sustainable methods that conserve water and protect the environment. Special events planned for 2008 include: Guided Garden Walks, Terrific Teas Garden Walk, and Growing Greener Roses Garden Walk. Sponsorship and Volunteer opportunities are available. The website has some interesting background and history information on the Discovery Gardens:

The mission of the Texas Discovery Garden is to have a positive impact on the future of Texas by teaching people effective ways to restore, conserve and preserve nature in the urban environment through the use of native and adapted plants that illustrate the interrelationship of butterflies, bugs and botany.

The goals of the Texas Discovery Garden are listed below**:**

- To provide a base of knowledge and understanding of the far reaching benefits of caring for the environment and to inspire community members to take positive action throughout their lives.
- To maintain gardens growing resource-efficient native and adapted plants that are appropriate for residential and urban landscapes.
- To provide self-paced, curriculum-supported tours utilizing the butterfly house, exhibit hall and gardens.
- To provide hands-on learning experiences throughout the campus.
- To display blooming plants in seasonal exhibits.

The Texas Discovery Garden opened in 1936 as the Hall of Horticulture for the Texas Centennial Exposition, the 7.5-acre campus includes the first public conservatory built in the Southwestern United States. Chartered in 1941 as a 501(c)(3) private, non-profit organization, Texas Discovery Gardens is the second oldest botanical institution in Texas, and the first in Dallas to offer botanical education programs for children. Since 1995, in conjunction with the State Fair of Texas, Texas Discovery Gardens has hosted an annual live butterfly immersion exhibit. In 2003, Texas Discovery Gardens was certified as the first 100 percent organic public garden in the state.

The purpose of Texas Discovery Gardens is to inspire and encourage knowledge gathering and appreciation of natural systems and their functions through programs and exhibits, especially:

- the impact of butterflies, bugs and botany on our environment,
- the health and beautification of the urban environment, and
- the cause and effect relationship of horticulture to our environment.

Texas Discovery Gardens offers interdisciplinary, hands-on, education and instruction that incorporates their 7.5-acre garden classroom. Programs are designed to be catalysts to excite children and adults about science education and to improve science education delivery. Staff and volunteers also visit schools, clubs, service organizations, daycare centers and other public venues where they teach through demonstration as well as interactive participation from the audience.

Since 1968, Texas Discovery Gardens has provided age-appropriate, hands-on natural science education programs. The structured, TEKS curriculum-based classes conducted by the Education Department are available on and off-site under the Earthkeepers name and include: Gardening for Children, Life in the Compost Bin, Terrarium Worlds, Math In Nature and Butterflies, Bugs and Botany. Teacher workshops are also hands-on and provide information/techniques for presenting science in the classroom. All programs meet the requirements for:

- National Science Standards and
- Texas Essential Knowledge and Skills for Math, Science, Reading, and Social Studies (TEKS).

Texas Discovery Gardens is approved by the Texas State Board for Educator Certification to offer programs awarding Continuing Professional Education units.
Texas Discovery Gardens partners with two South Dallas schools, Daniel Chappie James Learning Center (grades 4-6) and O.M. Roberts Elementary School, providing supplemental science education programs. Programs are also developed and presented with ArtsPartners, Region 10 Education Center, Dallas Zoo, Dallas Aquarium and Dallas Museum of Natural History. Staff members also participate in community and nationwide activities such as Earth Day, Monarch Watch and many others.

Texas Discovery Gardens participates in, and works in conjunction with, numerous local, state and national education and horticulture-related professional societies: American Association of Botanical Gardens and Arboreta, American Zoological and Aquarium Association, Entomological Society of America, International Congress of Butterfly Exhibitors and Suppliers, and the Texas Environmental Education Advisory Committee. Working partnerships have been established with Dallas Independent School District,

Stephen F. Austin State University, Texas A & M University and Extension service, and Richland College. Texas Discovery Gardens is the only Dallas institution permitted by the Texas Department of Agriculture and the United States Department of Agriculture to import, house and exhibit live tropical butterflies.

Accomplishments for 2005 included:

- 25,000 schoolchildren participated in Texas Discovery Gardens educational programs.
- Texas Discovery Gardens public participation was more than 160,000. Numerous community presentations were made by staff reaching an audience of more than 900.
- 30,000 annual & perennial plants produced for Texas Discovery Gardens programs and plantings.
- Volunteers contributed more than 9,800 hours valued at more than $170,000 to support operations.

The board of Texas Discovery Gardens is a 28-member volunteer governing and policy-making body, representing a cross-section of the Greater Metroplex population. The board includes professional people and community volunteers, all of whom have genuine and sincere interest in the mission and activities of Texas Discovery Gardens.

White Rock Lake

The 1,015-acre White Rock Lake has over 9 miles of hiking and biking trails, an Audubon Society-designated bird watching area and wetland sites, picnic areas, rental facilities, fishing piers, and White Rock Bath House Cultural Center. It is the site of the March of Dimes Walk America, White Rock Marathon, the White Rock Lake Trash Bash, and numerous sponsored runs. The website for White Rock Lake provides a link to "an unofficial guide to White Rock Lake" which provides an interesting history of the area.

Eagle Mountain Lake

Eagle Mountain Lake is located on the West Fork Trinity River, just north of Fort Worth and Lake Worth in Tarrant County. The 8,738-acre lake, impounded in 1931, is managed by the Tarrant Regional Water District. Predominant fish species include largemouth bass, spotted bass, channel catfish, white bass, and white crappie. The upper portion of the lake has reed beds while the lower and mid lake areas have fishing piers and boat houses that act as cover and structure for fish. Rocky points and bluffs at the lower end of the lake can also hold fish.

The Dallas Arboretum and Botanical Society

The Dallas Arboretum and Botanical Society is a privately run division of the Department of Parks and Recreation. In 1974 the Dallas Arboretum and Botanical Society (DABS)

adopted bylaws, elected officers, and incorporated as a non-profit organization. In 1977 the City of Dallas Park Board recommended the grounds of the DeGolyer estate, which the city purchased from Southern Methodist University, be the official location of the botanical gardens and encouraged DABS to raise funds for the initial costs. By 1980 DABS had raise over one million dollars, and purchased the 22 acre Camp estate adjacent to the DeGolyer estate both located at White Rock Lake. The gardens opened to the public for the first time in 1984. The arboretum offers educational programs for adults and children. ArtScape returns for its third year at the arboretum on September 21, and 21, 2008; this family oriented fine art show features artists from around the country and kicks off the arboretums annual fall festival Autumn at the Arboretum.

Cedar Ridge Preserve

Cedar Ridge Preserve (formerly Dallas Nature Center) has been managed by the Dallas Audubon Society since April of 2003 by charter from the Dallas County Park & Open Space Program and the City of Dallas. This "slice of the hill country," just 20 minutes outside of Dallas is a not-for-profit natural habitat of 633 acres. The area features 10 miles of hiking trails, a native plant nursery, butterfly gardens, and picnic areas. Educational programs are offered for school groups. Habitat Restoration and Trail Work is offered each third Saturday of the year, rain or shine, and volunteers are invited to remove non-native plants, restore trails and work in the butterfly garden.

Cedar Hill State Park

The following information comes from the TPWD website (**http://www.tpwd.state.tx.us/spdest/findest/parks/cedar_parks**).
Cedar Hill State Park is located at 1570 F.M. 1382 in Cedar Hill, Texas. In 1854, John Anderson Penn settled in the rugged cedar-covered hills of southwest Dallas County - an area known as the Cedar Mountains. Today, remnants of the original Penn Farm survive intact in the confines of Cedar Hill State Park. Cedar Hill State Park is a 1,826-acre urban nature preserve located on the 7,500 acre Joe Pool Reservoir. The Park's proximity to major metropolitan cities makes it an ideal destination for families who want to enjoy the great outdoors without spending precious time driving. The ruggedness and scenic beauty of the area combined with over 100 miles of shoreline and the water based recreation on Joe Pool is a major attraction. The Metroplex skyline reflects on Joe Pool at night adds to the relaxing atmosphere. The park was acquired in 1982 and was opened in 1991.

Penn Farm Agricultural History Center, located at Cedar Hill State Park, pays tribute to the disappearing Texas' family farm and affords a glimpse into agrarian history as farm machinery took the place of the horse and mule almost a century ago. The Farm is open 7 days a week to self-guided tours. There are reconstructed and historic buildings from the mid 1800s through the mid 1900s. The Penn Farm has a very relaxing atmosphere and is perfect for family walks. Self-guided and guided tours are available. Special tours can be set-up for school groups or other groups.

Cedar Hill State Park has 355 mostly wooded campsites with a shade shelter over some of the picnic tables. Each site has water, electricity, a fire-ring, a lantern pole, and a picnic table. All campsites are within walking distance of restrooms with hot showers. Additionally, there are 30 primitive campsites.

Cedar Hill State Park is home to the premier North Texas mountain bike trail. The DORBA trail, named for the volunteers of the Dallas Off Road Biking Association, was built by mountain bikers for mountain bikers. Over 1200 acres of prime mountain bike landscape are crisscrossed with 15 miles of intense riding. There is an information phone line for visitors to check trail conditions.

Birdwatching is a popular activity year-round at Cedar Hill State Park. The most sought after bird at the park is the Painted Bunting. Painted Buntings abound in the Park from the first week of May through August each year. The park is home to other neotropical migrants including the Yellow-billed cuckoo, the Indigo Bunting, the Chuck-will's Widow and many others. Fall and winter brings: Ruby-crowned Kinglets; Yellow-rumped Warblers; Gold Finch; American Kestrel; and Cedar Waxwing. Resident birds include the Eastern Bluebird, the Greater Roadrunner, the Loggerhead Shrike, the Red-tailed Hawk, the Great Horned Owl, both the Turkey and Black Vulture, and the Bewick's Wren. The park's bird list contains almost 200 species.

Cedar Hill has over 200 picnic tables with waist-high grills, and most have a view of the lake. Fishing facilities include: two lighted fishing jetties and a perch pond for youngsters. Lake fishing includes largemouth black bass, crappie ,and catfish. Slot limit on Joe Pool is 5 largemouth bass limit of fish under 14 inches or over 21 inches, with only one being 21 inches or greater. Crappie must be over 10 inches and the limit is 25 fish. Swimming beach facilities include a gravel swimming beach surrounded by picnic tables with grills. There are no lifeguards on duty. The park has 3 playgrounds conveniently located throughout the park. Two concrete four-lane boat ramps are offered and there is also ample boat trailer parking.

Joe Pool Marina is located at Cedar Hill State Park**.** Joe Pool Marina rents ski boats, paddle boats, jet skis, pontoon boats, and a house boat for family activities. In addition they have an indoor/outdoor fishing barge. They have a convenient store that sells bait, fishing gear, and camping gear, as well as some food products. Yearly boat slip rentals are available.

Cedar Hill has a park host program designed to assist the park staff with visitor services, fee collection, and light maintenance as outlined in the volunteer job description. In return for 25-30 hours of volunteer service, a campsite with water, electricity, and in most cases sewer hook-up are provided at no charge. There are four host categories including: Office Host, Campground Host, Maintenance Host, and Interpretive Host. The Friends of Cedar Hill State Park is another volunteer program that was organized to assist in the promotion, interpretation and operation of the park. As a fund raising and

service group, the goal of the friends is to help in the overall operation of the park through sponsoring events, helping fund projects and raising the awareness of Cedar Hill State Park as an asset to the community and surrounding areas. There are financial challenges facing Cedar Hill State Park and the Penn Farm. In order to help with these challenges Site Endowment Funds have been established within the Parks and Wildlife Foundation of Texas for each State Park site. These endowment funds are known collectively as the Lone Star Legacy Fund. Both Cedar Hill State Park and the Penn Farm have a Site Endowment Fund within the Lone Star Legacy Fund. This endowment has been established for the general support of the park. Proceeds are used for the operation and maintenance of Cedar Hill State Park and the Penn Farm.

There are many attractions near Cedar Hill State Park. The Dallas and Ft. Worth Metroplex contain such attractions as professional sports teams that include the World Champion Dallas Cowboys football team, the Texas Rangers Baseball team, Dallas Stars Hockey team, Dallas Mavericks Basketball team, and the Dallas Burn Soccer team. Other attractions include Ft Worth Stockyards and Water Gardens, Omni Theater, Dallas Museum of Art, Dallas Symphony, Dallas Opera, Billy Bob's Texas in Ft Worth, Dallas and Ft Worth Zoo, horse racing at Lone Star Park, Nascar racing at Texas Motor Speedway, Traders Village flea market, Farmers Market, Deep Elam night life Dallas Zoo, Dallas Nature Center, JFK Memorial, Six Flags Over Texas, Ft Worth Botanical Gardens, Ft. Worth Museum of Science and History, DFW International Airport , Ammon Carter Art museum, Will Rogers Coliseum, and the State Fair of Texas in October.

Facilities at Cedar Hill State Park include restrooms with showers; picnic sites with tables and grills; hike-in, primitive campsites; campsites with water and electricity; 4.5 miles of hiking/backpacking trails; 10.3 miles of mountain bike trails; 2 boat ramps (ten lanes); group picnic pavilions (capacities 50 and 100); and 2 trailer dump stations. All campsites have electricity and water and are located in wooded areas. Nearby Joe Pool Marina offers a year-round grocery store, plus boat rentals, and a fishing barge. Wireless internet access (Wi-Fi) is available for park visitors to use.

Cedar Hill State Park serves as a refuge to 5 native tallgrass prairie remnants which are federally listed as endangered. The tallgrass prairie remnants are the most important natural resource in the park. These small remnant prairies are dominated by Indian Grass, Little Bluestem, Big Bluestem, Sideoats Gama, Switch Grass, and many other native grasses. Other plants of interest in the prairie land include Rosin-weed, Old Plainsman, Wand Milkweed Antelope-horn Milkweed, Celestials, Spiderwort, Sensitive-briar, Purple Coneflower, Bluebell, Blue Sage, Fleabane, Ladies Tress, Iron Weed, Engleman Daisy, Maxamillion Sunflower, Downy Paintbrush, Heath Aster, Trout Lilly, Standing Cypress, Eryngo, and others. Eastern Gamma grass was reintroduced by park staff in selected areas as well as Meadow Pinks. The Cedar Hill area is unique in that historically it is where two climax eco-systems converge.

The tallgrass prairie and its rolling black clay soil clashes with the rugged limestone escarpment. Hundreds of years ago an ancient cedar forest covered the escarpment. It was in that rugged ancient forest that Golden-cheeked Warblers thrived. Sadly the Golden-cheeked Warbler is on the verge of extinction due to habitat destruction. Because of the unique habitat of the park the Golden-cheeked Warbler was recently spotted in February 2004. The tallgrass prairie was migratory habitat for the Eskimo Curlew now thought to be extinct. The transition zone between these climax ecosystems was full of brush, interspersed with grasses and small trees that were burned frequently by the prairie fires. This was home to the endangered Black-capped Vireo last seen in the area in 1993. Overall, the park is dominated by upland forests that include cedar elm, honey locust, mesquite, and juniper trees. In the scenic, wooded hills, common animals include bobcat, coyote, fox, squirrel, armadillo, and raccoon. Lake fishing is good for large-mouth bass, white bass, crappie, and catfish. The park is also an excellent flyway for neotropical birds.

The topography is unique at Cedar Hill State Park in that the blacklands roll into towering limestone escarpment. The escarpment has outcrops that run from Mexico to Kansas. The park is reminiscent of the Texas Hill Country and one will forget they are in the Metroplex while visiting Cedar Hill State Park.

Cleburne State Park

Cleburne State Park is located at 5800 Park Road 21**,** in Cleburne, Texas**.** The 528-acre park encompasses a lively 116-acre, spring-fed lake. Located southwest of Fort Worth, in Johnson County, the park was acquired from the city of Cleburne and private owners in 1935-36 and was opened in 1938.

The region surrounding Cleburne State Park was a favorite hunting ground for many Indian tribesmen, since it comprised densely wooded country amidst plains and included several clear water springs. The Comanches used this area as a trail from the northwest to raid the homesteads in the south. The Indians would lead two fresh horses as they rode a third one, switching to a fresh horse as each one was winded. In this manner they would escape their pursuers.

Their concealed trail was last used for a raid on Kimbell (now known as Kimbell Bend) which, built in 1851, was the first town in Johnson County. Kimbell was established on the Chisholm Trail at its crossing on the Brazos River. Vast herds of cattle from the southern ranches in Texas crossed at Kimbell Bend going north to the markets. The park, located eight miles north of Kimbell Bend, was also a good camp site for the cowboys who drove cattle on the Chisholm Trail.

In 1934, this beautiful valley of springs was recognized as a picturesque locality for a park. A group of local businessmen, interested in its development, secured it for the State Park Board to establish a state park. In 1935, Civilian Conservation Corps (C.C.C.)

Company 3804 of the federal government moved into the park site to start developing a park.

The C.C.C. enrollees built a small earthen dam at Cleburne State Park to impound the park's 116-acre lake, with a beautiful masonry, three-level spillway, then cleared a three-mile-long scenic roadway around the lake. A concession building, boathouse, and bathhouse were built in 1936, with additions in 1940.

The park residence, water tower, and interior furnishings display a variety of handcrafted wood and metal ornaments. There are many activities available. Cleburne State Park mountain bike trails offer 5.5 miles of beautiful scenery with a variety of challenges for all experience levels. The terrain on the trail is as diverse as the hills. There are treacherous down hills, fast smooth flats, and everything in between. The technical and wooded trails form an entire loop that has made this trail one of the favorites for mountain bikers in training or those who enjoy a challenging ride. Fishing and boating the clear blue waters of Cedar Lake is a wonderful way to spend the day with your family. Boats may not create any wake on this lake and personal watercraft (i.e. jet skis, skeedoos, etc.) are not allowed. Nearby attractions include Dinosaur Valley State Park, Meridian State Park, Lake Whitney State Park, Acton State Historic Site; Fossil Rim Wildlife Center; Texas Amphitheater featuring "The Promise;" Six Flags over Texas theme park and water park; Texas Ranger baseball in Arlington; three golf courses (Squaw Valley Golf Course, Nolan River Country Club, and Cleburne Municipal); and Lake Pat Cleburne.

All campsites at Cleburne State Park provide a picnic table and grill along with a campfire ring. Screened shelters are nestled in among the cedars and within view of the lake. Back-in campsites with utilities and shelters accommodate up to 8 people and combination of motor vehicles/trailers not to exceed two. Restrooms with hot showers are nearby. The Group Camp consists of a 2 group barracks (men's and women's) with bunk beds and mattresses; visitors provide bed linen and pillows. It sleeps a total of 44 people. The dining hall and kitchen seat approximately 60 people. The kitchen is furnished with a commercial size cook stove with griddle top, a refrigerator with a freezer, stainless steel sinks, cabinets, work tops and electric outlets. Visitors furnish dishes, pots and pans and silverware. The rear of the building has a patio with a large grill and picnic tables. All Group Camp buildings are heated except the restrooms and the Dining Hall is air-conditioned.

The natural features of the area include juniper (cedar), oak, elm, mesquite, redbud, cottonwood, sycamore, ash and sumac trees that cover white rocky hills. In early spring, there is a carpet of bluebonnets in the open fields and many other varieties of wild flowers throughout the park. Visitors find many species of wildlife to observe and photograph including: white-tailed deer, turkey, duck, armadillo, squirrel, skunk, bobcat, cottontail rabbit, raccoon, opossum, coyote, and many species of birds. Popular fish include crappie, bass, catfish, blue gill, and red ear sunfish.

Joe Pool Lake

The website contains a good description of the area (www.lakeparks.net/joepool.htm). Opened in 1989, Joe Pool Lake attracts more than one million visitors a year to its parks, shores, beaches, campsites and waters. This area is administered by the U.S. Army Corps of Engineers.

Fishermen find Joe Pool lake excellent for bass, catfish and crappie fishing. Water skiers, boaters and sailors appreciate the 7,500 surface-acre lake's wide-open spaces. Picnickers and campers enjoy the tranquil and lush parks and trails.

Acton State Historic Site

The Texas Historical Commission offers a website with information on Acton State Historic Site (http://www.thc.state.tx.us/hsites/hs_acton.shtml). Acton State Historic Site, located in northeast Hood County, is Texas' smallest historic site with a total of .01 acres. The site is the burial ground of Elizabeth Crockett, second wife of Davy Crockett, who married him in Tennessee in 1815. She died Jan. 31, 1860. Because Crockett fought for Texas and died at the Alamo, his heirs were eligible for a land grant, but Mrs. Crockett did not claim her grant until 1853. By that time all choice land was claimed and she had to give a surveyor half of her land for locating a tract for her gravesite. The monument was erected at Acton Cemetery by Legislative appropriation in 1911. The area is open daily and there are no fees. To reach the area travel 4.5 miles east of Granbury on US 377 to FM 167 South, then 2.4 miles south on FM 167 to Acton. The cemetery is on the right.

The website offers information on the other historic sites in Texas listed below:
Acton, Acton
Caddoan Mounds, Alto
Casa Navarro, San Antonio
Confederate Reunion Grounds, Mexia
Eisenhower Birthplace, Denison
Fannin Battleground, Fannin
Fort Griffin, Albany
Fort Lancaster, Sheffield
Fort McKavett, Menard
Fulton Mansion, Fulton
Landmark Inn, Castroville
Levi Jordan, Brazoria
Magoffin Home, El Paso
Sabine Pass Battleground, Sabine Pass
Sam Bell Maxey House, Paris
Sam Rayburn House Museum, Bonham
San Felipe, San Felipe
Starr Family Home, Marshall

National Museum of the Pacific War, Fredericksburg
Varner-Hogg Plantation, West Columbia

City of Dallas Trails

The following information on trails is taken from the interactive trail map found at the Dallas City Parks website.

Katie Jackson Trail is located 15.6 miles from downtown Dallas at 5000 Haverwood Lane. This 0.3-mile, 6'wide trail with concrete surface is open year-round. It winds through a beautiful natural area that is a refuge for many species of flora and fauna. The trail is rated as moderate in difficulty.

Bert Fields Trail is located 15 miles from downtown Dallas at 7500 Spring Valley Road, The 0.8-mile trail offers year-round hiking, bicycling, roller blade, and jogging opportunities in a park and residential setting along White Rock Creek. The trail is rated as easy.

Cottonwood Trail, located 18 miles from downtown Dallas at 140 Maham Road, offers hiking, biking, roller blading and jogging in a residential area along a Texas Utilties easement. The trail has multi-modal access to major shopping areas, transportation, medical facilities and educational institutions. The trail is envisioned as a "livable cities" project that will reduce traffic and air pollution. It is a joint community project between the City of Dallas Park and Recreation Department, Richardson and North Dallas Coalition Organization (RANDCO) and Texas Utilities.

White Rock Creek Trail, located 20 miles from downtown Dallas at 6900 Valley View, is 7.5 miles in length with a rating of easy to moderate. The trail offers hiking, roller blading, jogging and biking opportunities through Anderson Bonner Park, Harry S. Moss Nature Area, Fair Oaks Tennis Center and finally heads east to join the White Rock Lake trail system. Speed limit for bikes is 20 miles per hour.

L.B. Houston Hike and Bike Trail is located 6.8 miles from downtown Dallas at 1600 California Crossing. The trails range from 1.5 miles to 4 miles and offer hiking and off-road bicycling in a dense wilderness area along the Elm Fork of the Trinity River. Heavy rainfall renders them impassable for those not adequately prepared. The area is named for L.B. Houston, Director of the Dallas Park and Recreation Department from 1939 to 1972. The trail is rated as easy to moderate.

L. B. Houston Nature Trail is located 6.8 miles from downtown Dallas at 10000 Wildwood. A group of four unpaved hiking trails in a dense wilderness area along the Elm Fork of the Trinity River offers hiking and nature viewing opportunities. The trails vary in length from just over one mile to four miles. The trail runs along the river bank for over a mile affording opportunities for observing turtles, snakes, and herons.

Bachman Lake Park Trail is located 6.5 miles from downtown Dallas at 3500 W. Northwest Highway. A mixture of concrete and asphalt, the trail runs through park land around Bachman Lake and offers an exercise circuit with 16 stations positioned along the trail. The northern bank offers opportunities to view various species of ducks and geese, a grove of bald cypress trees, or sculling on the lake. Along the southern bank the trail offers a close-up view of planes taking off and landing at Love Field.

Turtle Creek Walk is located 1.8 miles from downtown Dallas at 3505 Maple Avenue. The trail is paved and runs on the west bank of Turtle Creek from Reverchon Park to Stonebridge a distance of 2.3 miles. The trail runs through park land and is a ribbon of green just north of downtown Dallas. In places the trail runs on wooden trestles built into the sides of the creek. The trail is rated easy to moderate although there a several flights of stairs.

Katy Trail is located 1.5 miles from downtown Dallas at 3300 Harry Hines. Built on the abandoned MKT (Katy) railroad with a Rails-to-Trails grant, this paved trail is now a bike and pedestrian highway. Phase I of the trail opened in 2000 and runs on the east side of Turtle Creek. The trail is wooded and offers some shade from the sun as it winds through parks, business and residential areas. The trail is rated easy to moderate.

Lower White Rock Creek Trail is located 7.5 miles from downtown Dallas at 6600 Scyene Road. This natural winding trail on top of the bluffs overlooking the Great Trinity Forest and Dallas was the camping area for American Indians. They posted lookouts on the limestone bluffs which overlook the Great Trinity Forest. The 4-mile trail is rated as moderate to difficult.

Gateway Park Trail is located 8 miles from downtown Dallas at 2600 Jim Miller Road. The trails range from 1 to 3 miles and meander along the limestone bluffs overlooking the Trinity Forest. The trail is rated moderate to difficult.

Rochester Park Trail is located 3.5 miles from downtown Dallas at 3000 Rochester. The one-mile paved concrete trail surrounding Rochester Lake has two fishing piers, covered picnic facilities, a playground, athletic fields and acres of nature area. In the spring wildflowers are abundant throughout the park.

The Buckeye Trail is under construction as part of the City of Dallas' Trinity River Corridor Project. A three-quarter mile spur from the trail will take visitors to a truly unique large grove of Texas buckeye trees.
(http://www.trinityrivercorridor.org/html/buckeye_trail.html)

Lake Cliff Park Trail is located 4 miles from downtown Dallas at 300 East Colorado Boulevard. The 1.01-mile trail winds through Lake Cliff Park with a lake surrounded by towering oak trees. Roller blades and skates are welcomed around the lake trail. In the early 1900's this privately owned land was the home of the Lake Cliff Casino, the largest

and most completely equipped theater in the South. Lake Cliff was a great amusement park with a mile-long roller coaster; the largest south of Chicago.

Oak Cliff Founders Park Trail is located 4 miles from downtown Dallas at 1300 North Zang Boulevard. The trail meanders through a park deeded to the city of Dallas in 1937 by Dr. W. W. Samuel. The 6.11 acre park overlooks the Dallas skyline. Beautiful rock walls line part of the trail. The 0.25-mile trail is rated as easy.

Kidd Springs Park Trail is located at 5 miles from downtown Dallas at 700 West Canty Street. A hard surface 0.75-mile path around the lake is great for walking or jogging. "Take a walk through the romantic Japanese gardens on the east side of the lake, or just sit on the bank of the lake and fish". At the turn of the century, Kidd Springs Park was an "elite country club" and the social center of Oak Cliff. Railroad man Turner purchased the springs from Colonel Kidd and organized a private social center along with attorney John D. Fouraker. They called their exclusive group the Kidd Springs Boating and Fishing Club. The Country Club included a clubhouse, rooms for dancing, bowling and other activities. The City purchased the park as part of a post WWII bond program.

John C. Phelps Trail is located 4 miles from downtown Dallas at 3000 Tips Blvd. The 1.3-mile asphalt trail, in Southeast Oak Cliffs, meanders along 20 acres through a heavily wooded area to 6-acre Wonderview Park.

Kiest Park Trail is located 7.1 miles from downtown Dallas at 3012 South Hampton. The 2.31 mile hard surface trail meanders along the perimeter and wooded area of the 264-acre park. In 1930 Edwin Keist, a prominent newspaper executive, donated a 178-acres tract of woodland to the city in memory of his wife. While serving as president of the Park Board in 1934, he added another 88 adjoining acres.

McCommas Bluff is located 12.5 miles from downtown Dallas at 1300 Riverwood. This area was designated as an historic natural trail for hiking the Trinity Bluffs. Settlers came to this site, which is the highest point on the Trinity River, to wait until the river lowered so they could cross into what is now Dallas.

Crawford Park Trail is located 14 miles from downtown Dallas at 8740 Elam. There are 2.1 miles of hard surface trails and 2 miles of natural trails.

Raymond W. Williams Hike and Bike Trail is located 6 miles from downtown Dallas at Pentagon Parkway. A relaxing 0.9-mile trail for walking, biking, or rollerblading on the concrete sculpture walk that focuses on five strategically placed bronze works, the tallest being nine feet. The Five-Mile Creek Sculpture Walk is a public art project by the Office of Cultural Affairs. Five sculptures are located on either side of Five Nile Creek.

Fireside Park Trail is located 14.5 miles from downtown Dallas at 8600 Fireside. This concrete trail crosses Prairie Creek in several areas and takes you through rolling terrain as it follows Prairie Creek. It is 1.2 miles in length and has been called one of the prettiest trails in Dallas.

Glendale Park Trail is located 6.5 miles from downtown Dallas at 1300 E. Ledbetter. Purchased in 1938, this trail is in the southeast Oak Cliff area of Dallas at Glendale Park. The trail meanders through the park and joins the central half of the park to the southern half with a hike and bike bridge spanning Five-Mile Creek. Hiking, biking and rollerblading opportunities are offered. The park also offers a community swimming pool, several parking lots, lighted tennis courts, picnic shelters and playgrounds. The 1.7 mile trail is rated easy.

Boulder Park Trail is located 10 miles from downtown Dallas at 3200 Red Bird Lane. This one-mile natural trail winds through 106 wooded acres making the park perfect for hiking or mountain biking. It was purchased in 1967 to serve as an overshoot for the Red Bird Airport runway. No parking is available.

Dallas Nature Center, now known as Cedar Ridge Preserve, features 10 miles of hiking trails, a native plant nursery, butterfly gardens, and picnic areas.

Hulcy Park Trail is located 15 miles from downtown Dallas at 1200 Danieldale Road. The 0.3- mile trail meanders through a remote and wooded area of the park.

Free Access wi-fi parks are offered in the Dallas area. The following areas are included on the wi-fi map shown at their website: Timberglen Recreation Center, Campbell-Green Recreation Center, Lake Highlands Recreation Center, Ridgwood-Belcher Recreation Center, Tietze Park, Exall Recreation Center, Kidd Springs Recreation Center.

The above partial inventory of outdoor recreation opportunities in the Dallas area shows that although there are many outdoor recreation opportunities offered in the Dallas Fort Worth area the opportunities within a short drive from downtown Dallas are limited. There is a huge demand for outdoor recreation opportunities for all ages and abilities.

An objective of the Great Trinity Forest is to provide access to the area through a series of looped trails. Although there are numerous trail opportunities in the Dallas area there is nothing near the magnitude of the trail systems that will be provided at the Great Trinity Forest. No trail opportunities are as extensive as those that will be provided at the Great Trinity Forest. Another objective is to encourage a variety of safe and healthful outdoor recreation opportunities for families. No current opportunities exist to offer the tremendous variety of trails for hiking, bicycling, horseback riding, and nature viewing trails that will be offered on the Great Trinity Forest. A third objective is to foster an appreciation of the natural environment through education and

interpretation. Although other opportunities exist for education and interpretation, no areas are as extensive in size and diversity as the Great Trinity Forest. The final objective is to offer a diversity of trails through various habitats and ecosystems found in the Great Trinity Forest. No system of trails for hiking, biking, horseback riding, and nature viewing offers the diversity of tree species, understory vegetation and flowering plants as those managed at the Great Trinity Forest.

Market Segmentation

Knowing your customers is the first step in successful marketing. Market segmentation is a means used to identify markets within a general market. A market segment is a group whose members have something in common, it must be distinguishable from other market segment, must be reachable by available communications media, and must be of sufficient size for successful marketing. Kotler (1982) specifies three criteria for the selection of a viable target market; measurability, accessibility, and sustainability. Measurability refers to how easily the researcher is able to ascertain the size of the potential target market as well as information related to the amount of discretionary time and money or other related information of importance. In some cases, demographic or geographic information is quite easily accessed while information related to needs, psychographics, or state of readiness is often more difficult to obtain. Accessibility refers to a number of factors including location, timing, or affordability of the program or service. For example, many public and nonprofit leisure delivery systems have difficulty designing accessible (attractive) programs for teenagers. Sustainability refers to the size of the target market; it must be large enough to make the venture worthwhile.

The target market segments for the Trinity River Forest will be:

- Urban families with young children,
- Students of nature,
- Tourists visiting the Dallas area

Families with young children will be targeted by special or seasonal events. These events will be highly publicized via a website and through local media and public service announcements. Families will be welcomed to the hiking, biking, horseback riding and nature trails for healthful exercise and opportunities for relaxing. Students and those interested in learning more about nature will have year-round access to the hiking and nature viewing trails which offer interpretive themes regarding ecosystem management, tree and vegetation identification, wildlife viewing/wildlife study opportunities. Tourists can enjoy a backcountry experience right in the heart of Dallas. The following is a list of some interpretive themes that can be expanded upon:

- The City of Dallas is managing the Trinity River Forest to provide the public with healthful outdoor recreation and nature study opportunities to nourish the minds and bodies of our young people

- The City of Dallas manages the Trinity River Forest to provide habitat for a variety of wildlife, forests for clean air and water, and protection of the river system both now and for future generations
- The City of Dallas manages the Great Trinity Forest for a variety of tree species and understory vegetation to maximize habitat for wildlife
- The Great Trinity Forest provides an array of diverse ecosystems for recreation, wildlife study and viewing
- The Great Trinity Forest provides recreation and wildlife benefits both now and for future generations

The RV market can be segmented into two main categories: motorhomes (RVs built on a motor vehicle chassis) and towables (designed to be towed by a motor vehicle). Motorhome sales generated $5.3 billion , or 61.6 percent, of the total RV market in 2001 with towable sales generating the remaining $3.3 billion

As baby boomers continue to age, the RV industry stands to experience significant future growth through increased spending of the RV lifestyle (Crowe Capital Markets LLC). As baby boomers age they have the disposable income and free time necessary for RV use.

Marketing Strategy

After analyzing both internal and external environments the next step in a marketing plan is to identify the target market, the target's objectives, and identify the target's alternatives. If the target market is families with young children the target's objective may be to educate and entertain the children. There may be many opportunities for a family to entertain and educate children within the Dallas metroplex but few where this can be done in an outdoor setting. A more defined objective for the Great Trinity River Forest may be to offer conservation education opportunities for young children and their families in an outdoor trail setting within the Dallas metroplex.

Target market strategies have four phases. First, the criteria established for selection of the target market and these must be measurable, accessible and substantial. Secondly, alternatives for selection of the target market are explored such as benefits (anticipated benefits of the product or service) versus users (anticipated users of the product or service). Third, market clusters are developed. And lastly, the actual target market strategy is selected.

Target market strategies for parks, recreation and leisure are discussed in Chapter Three of Marketing for Parks, Recreation and Leisure (Ellen L. O'Sullivan, 1991, Venture Publishing, Inc. State College, PA.). While understanding target marketing is a first step towards developing a market orientation for parks and recreation, it is only the beginning of the process. Specific target market segments must be selected to be profitable or appropriate and strategies must be developed for attracting these selected markets.

TRAILS AND FAMILY ORIENTED OUTDOOR RECREATION OPPORTUNITIES

This section addresses each type of trail or outdoor recreation opportunity that may be offered at the Great Trinity River Forest including: hiking, mountain biking or bicycling, horseback riding, camping and fishing. For each activity a general description or background is given. A section on signing and information is given for each activity; this section also addresses outreach and websites. A section on interpretive themes addresses issues pertinent to each activity. A section on establishing partnerships is given for each activity. Methods of reaching the user as well as potential users will be offered including brochures and website information.

Signing is critical for the success of any area. People need to be able to locate the trails easily so directional signing should be very clear so that visitors know the proper exit and can easily find trail head parking areas. Signing needs at the trailhead and along the trail will be addressed. Regulations and other information that should be included on bulletin boards at trailheads will be addressed as well as interpretive signing.

Successful use of volunteers in many aspects of the Great Trinity Forest, from maintenance to interpretation, will be addressed.

Hiking Trails

Background

Hiking trails offer a chance to exercise both mind and body for people of all ages and abilities. In its most basic definition hiking is simply walking for recreational purposes. Hiking can be a one-hour stroll or a three-day expedition. At a more advanced level hiking can be a starting point for learning survival skills, camping, navigation skills, or just learning more about nature. The term hiking brings to mind the great outdoors and the setting is an important part of the hiking experience. Hiking is an escape back to nature. Walking for pleasure is one of the most popular outdoor recreation activities nationwide; no special equipment is needed other than a pair of comfortable shoes for a short walk. However extended hikes require planning ahead and following common sense procedures to ensure a safe and pleasurable experience for the entire family

Trail users need food, lodging, campgrounds, special clothes, shoes and equipment. Hiking tourism is a “green” industry and businesses, such as cafes, bike shops, rental stores, bed and breakfasts. Studies related to various trails have found that they created $300,000 to $9 million in new money for adjacent communities (Sporting Goods Manufacturers Association, 2001).

The hardened-surface spine trail provided throughout the Great Trinity River Forest will focus on hiking opportunities. By offering hiking trails the Great Trinity Forest will be offering an outdoor recreation that is in great demand and one that will benefit the citizens of Dallas and surrounding communities.

Accessible trails offer some special accommodations to allow wheelchairs to function easily on the trail. Accessibility involves limits in the maximum grade or slope of the trail, specifications for typical and maximum tread cross slope, minimum clearance tread width, tread surface type and firmness, and lack of height obstacles. Accessible trails offer a firm and stable surface capable of supporting a baby carriage or a wheelchair. Where feasible, hiking loops located closest to the trailhead should be made accessible. This will make the trail accessible to families with infants in carriages, senior citizens that have some limitations in walking as well as persons with mobility impairments. Signing at the trail head should note if the trail is accessible or if a portion of the trail is accessible.

Signing and Information

The following section addresses signing and bulletin board information at the hiking trailheads and along the trail, some suggested interpretive themes, and ideas for marketing.

Different types of settings for hiking experiences call for different types of signing in terms of materials, color, lettering, messages, and frequency of signing. Hiking in large undeveloped areas, with difficult access and few signs, gives the hiker a sense of self-reliance and challenge. In contrast, when hiking outside a visitor center the visitor expects easy, accessible trails, numerous signs and information; the experience is comfortable and secure, and opportunities for learning and socializing are plentiful. The trail opportunities provided at the Great Trinity Forest will be somewhere between these two extremes in setting.

Trailhead information will include a bulletin board or small kiosk displaying a large, easy to read, map of the trails showing "you are here." It is a nice option to offer smaller maps for hikers to take with them; small maps may include a few key messages regarding safety, regulations or key contact information for those interested in volunteering. A volunteer group could be responsible for keeping map information updated and trailhead boxes replenished with maps. Local businesses may wish to donate funds to pay for maps in exchange for their business information being included on the map or brochure. Information at the trailhead will focus on basic safety information, regulations, resource protection messages, and emergency contact information. Safety information includes precautions for the hiker including: carrying water, dressing for the weather, carrying sunscreen and insect repellant. Regulations for the hiking trail would address: no hunting along or across the trail, staying on the trail for safety and resource protection, traveling in groups, leaving an itinerary of your trip with a responsible party, and carrying a cell phone or GPS unit in case of emergencies. Resource protection messages may include: leave flowers and rocks for other to enjoy, do not disturb vegetation, wildlife or archeological sites.

Information offered at the trailhead or at the website should focus on what the user is looking for. The Sporting Goods Manufacturing Association (SGMA) gives a list of

priorities that hikers want from trail operators. Information is at the top of this list including: campsites, trails, guides, information on wildlife; access to the trail opportunities, and value. Some suggestions are given by SGMA for making communities more "hiker friendly." Suggestions are listed below and many could be incorporated into trailhead bulletin boards, brochures or included at the website. Some of these are just great marketing ideas.

- establishing hiking corridors or greenbelts with community help,
- providing detailed maps of trails,
- enlisting local hikers as host contacts for hikers,
- posting current information on the internet,
- supporting local summer day camp operations,
- supporting local equipment stores,
- publishing a list of places that are open early and late, where supplies such as gas, coffee, box lunches, breakfast, film, sunscreen, bug repellent, hats, waterproof clothing, footgear, and camping equipment can be bought and where equipment can be repaired
- welcoming hikers and campers with signs, banners, and festivals
- host information sessions and field trips for local officials on the importance of hiking and camping and show them local nature attractions.

Regulations should be posted and followed so hiking impacts can be minimized. Frequently regulations address issues such as gathering of firewood, disposing or packing out trash, and restricting camping along, or near, trails. A number of organizations exist to help hikers by offering tips, guidelines, and philosophies for minimizing the impacts of hiking on the very environments they are seeking. Leave No Trace (www.lnt.org) and Tread Lightly (www.treadlightly.org) both offer helpful information that will improve the safety and sustainability of hiking experiences. Some of the topics discussed at those sites are offered here.

The Leave No Trace Center for Outdoor Ethics is a national and international program designed to assist outdoor enthusiasts with their decisions about how to reduce their impacts when they hike, camp, picnic, snowshoe, run, bike, hunt, paddle, ride horses, fish, ski or climb. They offer a detailed list of recommendations for hikers and others.

- Plan and Prepare- know the regulations, prepare for extreme weather and other emergencies, schedule trips to avoid high use times, visit in small groups, use maps and compass
- Travel and Camp on Durable Surfaces – stay on established trails
- Leave What you Find – preserve the past but do not disturb historic artifacts, leave rocks and plants for others to enjoy, avoid introducing or transporting non-native species, do not dig or build structures
- Minimize Campfire Impacts – use stoves for cooking, avoid camping in riparian areas, use established campsites
- Dispose of Waste Carefully - pack out all trash, use catholes for human waste

- Respect Wildlife – observe but do not disturb wildlife, never feed animals, store food securely, control pets at all times, be familiar with nesting seasons and avoid wildlife during these times
- Be Considerate of Other Visitors – be courteous, yield to other users as appropriate, take breaks and camp away from trails, avoid loud sounds (radios)

The philosophy of Leave No Trace offers guidance in limiting the impact of hikers on the land as well as several other outdoor recreation activities. Leave No Trace (www.lnt.org) offers educational and ethical programming. The basic principles of Leave No Trace include: planning ahead, traveling and camping on durable surfaces, disposing of waste, leaving what you find, minimizing campfire impacts, respecting wildlife, and being considerate of others.

The Tread Lightly philosophy recommends staying on designated trails, walking single file to reduce widening the trail, removing flagging, complying with signs, regulations and barriers, traveling with a buddy to improve safety, respecting other trail users by keeping noise down, avoid entering private property or leaving gates open, educating people about trails, using maps and being familiar with regulations, and knowing how to use equipment properly. Hikers should avoid sensitive areas and pack out anything that is packed in.

Hikers enjoy viewing wildlife yet some animals are sensitive to the presence of humans especially around mating season. Hikers should learn the habits of species in order to avoid adverse impact. Signing should be used to inform hikers of sensitive periods.

Sometimes hikers can interfere with each others' enjoyment or that of other users of the land. Hiking etiquette can minimize the impacts. When two groups of hikers meet on a steep trail, there may be contention for use of the trail. To avoid conflict a custom has developed where the group moving uphill has the right of way. In other situations, the larger of the two groups will usually yield to the smaller group. Being forced to hike much faster or slower than one's natural pace can be annoying and difficult to maintain. A common custom is to have the slowest hiker in the lead and have others match that speed. Another is to have an experienced hiker sweep up the rear to ensure no one is left behind. Noise by groups along the trail can impact the solitude of the hiking experience. Some hikers purposely avoid loud sounds out of deference to others. Staying quiet will also increase the likelihood of encountering wildlife.

Hikers sometimes trespass unknowingly onto private property, alienating adjacent landowners. Staying on well-marked trails avoids the possibility of trespass.
There are safety precautions that hikers should take. Threats to hikers include: losing one's way, inclement weather, hazardous terrain, attacks by animals, internal injuries or sprains. Often the proper behavioral prescriptions will minimize these threats. The Mountaineers, a hiking and mountain climbing club, first described the 10 essentials of hiking back in 1930. Many hiker groups such as the Texas Sierra Club continue to

recommend carrying the following 10 essentials: map, compass optionally supplemented with a GPS receiver, sunglasses and sunscreen, extra food and water, extra clothing, headlamp or flashlight, first aid kit, fire starter, matches, and knife. In some cases these essentials can be supplemented with water treatment devices, insect repellent, signaling devices (whistle, cell phone, or two-way radio, mirror or flare). Some include carrying water to avoid dehydration, wearing appropriate footwear and clothing to avoid frostbite, sunburn, ankle sprain, and insect bites.

Disposing of human waste is often a major source of environmental impact from hiking and can contaminate watersheds and make other hikers ill. Catholes can be used to limit impacts and should be dug 4 to 10 inches deep, depending on local soil composition, and should be at least 200 feet away from water sources and trails.

Website information, generally used for planning an outing, will focus on directions to the site, parking, fees, level of difficulty, and tips on what to bring.

Interpretive Ideas

Interpretive brochures and signage for hiking trails can be more detailed than trails requiring special equipment or skills such as bicycling or horseback riding trails along which people are moving at a higher speed or too focused on the task at hand to stop and read a lengthy sign. Interpretive brochures and interpretive signing along the trail can offer an option to just hit the headlines, as well as the option of more detailed information for those who have the time and the motivation for in-depth study. An example would include small signs on, or posted near, trees giving tree species and more detailed information on the uses of the tree, the wildlife that benefit from the tree, or information on the life history of the tree which may be included in a brochure.

It is recommended that interpretive brochures for the hiking trails be developed to address tree identification, wildlife viewing and ecosystem management. Interpretive information will be included in a brochure hikers can carry along the trail and signing can occur at intervals along the trail where users stop and read a short section of the brochure. Most local nature groups such as Sierra Club, Audubon Society, or others will be interested in developing and distributing interpretive brochures. Multiple groups can be listed as sponsors on the brochure or at the trailhead itself. Hiking groups will be interested in developing brochures or handouts that list local stores furnishing equipment and services that hikers often need. Organized groups include the American Hiking Society (www.americanhiking.org) or local groups based on church or communities may wish to play an active part in the construction, maintenance, interpretive planning, or other areas of trail management. Various groups may choose to develop brochures that expand on a variety of subjects depending on their particular interests and backgrounds.

Partnerships

Partnerships are an important element of a successful trail system. Partnership opportunities can be offered to local and nationwide user groups, communities, local businesses that serve hikers, local churches or religious institutions, local businesses and schools. Outreach efforts may involve a "Local Leaders" event day where invitations are extended to local leaders in the community to come out and see the trails and find out how they can become involved and help their community.

Volunteers will be an important element of each of the hiking trail systems. Volunteer programs such as "adopting" a section of trail by performing routine maintenance along the trail in exchange for naming the trail, or having a plaque placed at the trailhead or along the trail, can be a wonderful incentive to encourage volunteer participation. Volunteers will be instrumental in spreading the word about the trails, helping with special or seasonal interpretive events, and accomplishing trail maintenance. Volunteer groups for hiking trails are generally active users of the trail system. By involving volunteers in the management of the trail systems the manager will ensure that he/she is staying in close contact with the user and that the needs of the user are being considered in every aspect of management.

Mountain Biking Trails

Background

Mountain biking trails could easily be provided at the Great Trinity Forest. Mountain biking opportunities, especially those of extended mileage, are rare within a short drive of downtown Dallas.

Mountain bikers vary by their skill level, fitness, motivation and equipment type (Managing Mountain Biking, (Pete Weber, ed)). The IMBA identifies the following types: Beginner Cross-Country Riders, Avid Cross-Country Riders, All-Mountain Riders, Downhillers, Freeriders, and Dirt Jumpers. The following covers some of the basic types of bicycle riders and the trail experiences they may prefer.

Beginner Cross-Country Riders prefer dirt roads, dedicated bike paths, and relatively smooth, wide, short trails. As they become more skilled they seek longer, more difficult routes.

Avid Cross-Country Riders are experienced cyclists and race-oriented riders who are comfortable in the backcountry, typically self-sufficient, and carry tools, water, food, clothing and first aid kits. Avid riders seek trails ranging from 10 to 100 miles and are in search of solitude, nature, exercise, and challenge. Looped trails are best.

All-Mountain Riders fall into a catchall category including highly skilled riders as well as newcomers. They typically seek a variety of trails but enjoy technically challenging routes.

Downhillers are usually advanced riders who use sophisticated equipment specifically designed for descending challenging trails. Since downhill bikes are heavy, riders seek access to a road for vehicle shuttle to the top. Ski areas that provide summer service are popular with downhillers.

Freeriders like challenge such as rocks, logs, elevated bridges, dirt jumps, drop-offs, and teeter-totters.

Dirt jumpers seek dedicated jumping areas with a mix of jump styles, but they often fit into other trail-riding mountain bike niches as well.

Signing and Information

Signing at mountain bike trailheads should feature an accurate map showing looped trails with trails with the easiest skill levels located nearest the trailhead while those more difficult or advanced level trails are located furthest from the trailhead. The beginner rider should be able to complete a loop, or loops, without being forced to use difficult routes.

Trailhead bulletin boards should list regulations for the mountain biking trails and should focus on user safety and resource protection. Both Leave No Trace and Tread Lightly websites offer information tips on safety and resource protection. Messages about staying on the trail, and avoiding switchbacks or shortening of the trail, are useful for both user safety and for resource protection.

The International Mountain Bicycling Association (IMBA) offers 6 basic rules that can be adapted for trailhead bulletin boards.

1. Ride on Open Trails Only

   Respect trail and road closures; avoid trespassing on private land; obtain permits or authorization as needed or required.
2. Leave No Trace

   Be sensitive to the dirt beneath you. Recognize different types of soils and trail construction; practice low-impact cycling on trails more vulnerable to damage. When the trail bed is soft consider other riding options. Don't create switchbacks. Be sure to pack out all that you packed in.
3. Control Your Bicycle!

   Inattention for even a second can cause problems. Obey all bicycle speed regulations and recommendations.
4. Always Yield Trail

   Let fellow trail users know you are coming. A friendly greeting or bell is considerate and works well; don't startle and show respect when passing by slowing to a walking pace, or even stopping. Anticipate other trail users around the corners, establish communication and be prepared to stop if necessary.
5. Never Scare Animals

All animals are startled by an unannounced approach, a sudden movement or a loud noise. Give animals extra room and time to adjust to you. When passing horses use special care and follow directions of horseback riders (ask if uncertain). Disturbing wildlife is a serious offense.

6. Plan Ahead

Know your equipment, your ability, and the area in which you are riding and prepare accordingly. Be self-sufficient and have your equipment in good repair. Carry necessary supplies for changes in weather or other conditions.

By using signing and messages created and supported by nationally recognized and organized user groups, such as IMBA, it is more likely that users will respect and heed the message.

Tread Lightly (www.treadlightly.org) gives basic do's and don't of mountain bicycling:

- Travel Responsibly – Avoid trails that are wet and muddy and by heed signs and barriers.
- Respect the Rights of Others – Be considerate of others and yield the right of way.
- Educate Yourself - Obtain a map, prepare in advance and check the weather.
- Avoid Sensitive Areas – Do not disturb archeological sites, or wildlife, especially during nesting seasons.
- Do Your Part to Leave the Area Better than You Found It - Carry out all trash and leave rocks and flowers for other to enjoy.

Interpretive Ideas

Depending on the type of trail and the challenge level, interpretative information may be confined to the trailhead or to designated points of interest along the trail. Because the user will be focused on controlling a bicycle, numerous signs or a brochure may not be appropriate. A few main messages, such as those listed above may be all that is needed at the trailhead in addition to safety information. A destination point such as a scenic overlook could have a sign highlighting certain management techniques practiced at the Great Trinity Forest.

Partnerships

Mountain bicyclists generally take an active role in construction and maintenance of bicycle trails. Both the International Mountain Bicycling Association (IMBA) and Bikes Belong offer construction and maintenance ideas at their websites.

IMBA Trail Solutions Services offers trail design, construction, assessment and education. They support well designed and sustainable trail systems. The IMBA Trail Care Crew, sponsored by Subaru of America, support two expert trail crews who travel nationwide leading trail work sessions, meeting with land managers and working with IMBA affiliated clubs and members to improve mountain biking opportunities. They offer a popular 2-day Trail Building School. IMBA offers a Volunteer Stewardship

Challenge program sponsored by REI at their website; club leaders can log in trail hours. REI and IMBA have targeted a goal of 10,000 volunteer days by 2010 with the objective of boosting volunteerism within the mountain biking community. IMBA also offers ideas for volunteers such as: planning events, tips for recruiting volunteers, fundraising, and organizing women's groups, etc.

Bikes Belong has a Bicycle Friendly Community program to motivate cities to improve bicycling facilities. They provide funding to create better resources for bicyclists through the Bikes Belong Grants Program. They encourage kids to ride bikes through the Safe Routes to School National Partnership. And they are active in bicycle safety.

Horseback Riding Trails

Background

Horseback riders are a group with specialized skills. Their horses are often expensive and always dear to them. Most riders are looking for trail opportunities that are safe and enjoyable for the rider, as well as the horse, and trails that offer opportunities for beginner and more advanced riders. Riders, especially new riders, will want to know of obstacles they may encounter along the trail such as bridges, uneven terrain, or other users; in this way they can determine if they and their horse are prepared to negotiate the trail. Like the mountain bike trails, the looped trail system approach offers easy, or beginner, trails near the trailhead while more difficult trails are located furthest from the trailhead. Loops located at more of a distance from the trailhead are more challenging and beginners can chose not to use those loops.

The Equestrian Design Guidebook for Trails, Trailheads and Campgrounds (U.S.D.A. Forest Service, 2008) offers detailed information on horse trails. In designing and constructing horse trails it is important to keep in mind the needs of horses as well as their riders. Horses are prey animals. They are always aware of an escape route and become agitated when trails narrow or are blocked. Anything that moves suddenly or makes an unexpected noise can startle a horse and cause it to bolt putting horse, rider, and bystanders in danger. Bicycles can easily startle horses if they come up behind a horse or if they appear on the trail suddenly. The bicycle rider should make horse riders aware of their approach by use of a bell. Bicycle riders should stop, dismount and speak to the horse rider if they are unsure; in some cases they may want to remove their bicycle helmet so the horse can see that it is a human. As horses get used to bicycles they are less likely to startle at their presence.

Horse manure is a valuable fertilizer but too much of it can cause a nuisance at trailheads, confinement areas or where trailers are parked. Because horses and mules defecate within the first one-half mile, consider two short trail segments from the trailhead; one for riders and one for other users. Involve planners, managers, users and riders in developing a procedure for dealing with manure. Provide separate equestrian parking for larger trailers and so that others do not have to deal with manure. Develop a partnership with landscapers or gardeners to use the manure for fertilizer.

Trailheads can be made accessible with an accessible parking space that allows enough room for a wheelchair to be unloaded from a van and an accessible pathway or surface leading to a mounting facility. A mounting facility is essentially a firm and stable ramp allowing a wheelchair to reach the level needed for the individual to mount the horse safely with assistance from another. The accessible mounting facility can also be convenient for new riders, young children, or persons with a minor knee or leg injury. No special accommodations need to be made once the individual has mounted the horse.

Signing and Information

Signing at horseback riding trailheads should be placed at a higher level than signing along a hiking trail. Generally trail clearance will be 7 feet in height. Trailhead signing should address: rider information, safety information and resource protection information. Rider information will include the length of the trail, obstacles along the trail or other users that may be encountered. Resource protection messages may include staying on the trail. Safety messages are also appropriate at the trailhead including: leaving an itinerary with a responsible party, traveling in numbers, using insect repellent, and carrying a cell phone or GPS device in case of emergencies. Both Leave No Trace and Tread Lightly websites offer tips on safety and resource protection signing appropriate for horseback riding trails.

Signs along the trail will address user safety and known hazards such as closed trail segments, or bridge closed for maintenance. Trail blazes or aluminum markers serve as reassurance markers for users confirming their location by showing distance traveled (mile markers). The trail loop or loops may be color-coded. User skill level may be noted where appropriate.

Universal, or pictorial, signing should be used whenever possible as it eliminates the need for bilingual signing, is easier to comprehend, is intuitive and limits wordy signs. Universal signs along the trail may include the permitted uses along the trail including a diagram of a hiker, horseback rider or bicycle as appropriate. Prohibited uses along the trail may also be indicated such as a motorized vehicle with a slash through the sign indicating that it is not allowed.

Signs should be simple, clear and concise. As a general rule a reader will not carry away more than 3 messages or principle ideas after reading a sign. The minimum signing necessary should be provided; excessive use of signing will result in reducing its effectiveness.

The natural surfaced horseback riding trails may offer half-day or all day riding opportunities; these alternatives may be noted at trailhead maps, or on small maps distributed at the trailhead, or be made available for downloading at the website.

Brochures and trail head information should include maps showing the trailhead location, trails, and mile posts along the trails.

Interpretive Ideas

Horseback riding opportunities could be readily offered along the primary, or spine, trails at Great Trinity Forest. Interpretive messages recommended for the spine trails center around the ecosystem management efforts of the City of Dallas. Several destination points should be highlighted along the trail showing various habitats, management efforts, scenic vistas or historic points of interest.

Partnerships

Many horseback riders enjoy trail riding in groups; this may be done for safety, pleasure or the efficiency of transporting a group of horse in a trailer. Local trail riding groups may be formal groups or informal groups of friends. Managers should encourage informal groups to formalize and initiate a Friends of the Great Trinity Forest volunteer group. Most riding groups will enjoy naming various segments of the trail in exchange for "adopting" a trail segment or performing maintenance along a given trail segment or at a trailhead. Businesses selling saddles and tack or other equipment or services for horses, and their owners, may be interested in sponsoring events, brochures, or signing along the trail or at trailheads. Feed stores may be interested in sponsoring maps, brochure, websites in exchange for being named as a sponsor and may be willing to distribute materials to their patrons.

Riding events can be held to bring together riders interested in construction and maintenance of the riding trails. Local riding clubs can offer workshops on trail riding, practicing various riding skills. Working draft horse teams can be used to remove fallen logs from the trail or to place, or monitor, signing along the trail. Trail inspections of all types can be done on horseback.

Equestrian Design Guidebook for Trails, Trailheads and Campgrounds offers several good fundraising ideas:

- Hoofs, Heels, and Wheels – Arrange a relay "race" among teams of riders, bicyclists, and hikers. This event has the added benefit of bringing three different user groups together for a common cause
- Benefit Trail Rides – Arrange events around a theme such as riding with a celebrity, or plan a ride to follow a special route such as an endurance course or historic trail.
- Fund-a-foot or trail – Offers sponsorships for proposed sections of trails. Sponsors fund a portion of the trailhead or a gate, for instance. Offer various costs levels to encourage broad support.
- Equine Expo – Showcase the world of horses and their kin through public demonstrations, exhibits and educational offerings. An equestrian art exhibition is a variation on this theme.

- Limited edition or specialty sales – Raise money with royalty programs for special license plates, trail products, or services. These approaches may be a good way to help pay for recurring expenses such as trail maintenance.

The American Trails website has a document titled Eighty-five Creative Funding Ideas for Trails and Greenways (MacDonald, 2003).

Camping Areas

Background

Camping is the seventh most popular recreation activity in the U.S. according to Sporting Goods and Manufacturers Association (SGMA). Camping done in dispersed areas is often referred to as primitive camping as no amenities, water, sanitation or parking are offered. Camping offered at a campground is often referred to as developed camping as amenities such as water, electric, and sewage is often provided, and expected, by the customer.

Establishing the number of days of operation is critical to understanding the potential of occupancy, and hence revenues, of the project. It is likely that an RV park located in Dallas, Texas, could successfully operate 365 days per year, given the mild climate and the anticipated demand. Demand will be highest on weekends and holidays and price increases for high demand days and/or high demand sites should be considered.

A developed campground should generally have at least 75 campsites in order to realize economies of scale. If the proposed RV park has too few sites the operation becomes inefficient; too many sites and the operation becomes unmanageable. A looped design layout is usually followed as it offers ease of entry and exit, ease of finding numbered sites, efficiency of placement and spacing, and enhanced visual quality of a more natural looking road and spur system rather than straight lines and squares. However, in this situation a road system already exists so it would be more economical to continue with the existing road system. Within a looped system restrooms and bathhouses are placed at the node of the loop rather than the center of the loop to prevent multiple access pathways being created as each campsite user creates a path to the restroom.

Signing and Information

Signing at camping areas will include site identification signing, traffic control signing, registration and fee payment signing, site maps, and signing to identify the operator or concessionaire at the campground. Site identification signing is placed at the site entrance so that it is the first thing that visitors see. The site identification sign makes an initial impression on the visitor. The site identification sign should be appropriate for the setting and blend with the environment, be attractive and well-maintained. Traffic control signing needs should be determined by a road engineer familiar with road conditions, stopping distances, and viewing distances. Registration and fee payment signing should clearly describe the fee structure at the campground; the rules for the area should also be made apparent. The site map should orient visitors and mark

important areas including: fee entry station, parking areas, restrooms, hiking trails, and other areas of interest.

Interpretive Ideas

Campgrounds often offer interpretive programs on weekend evenings when the largest group of visitors is present. These programs can revolve around native wildlife, birds, snakes and insects. Local conservation organizations may be interested in presenting nature program of interest to their members. Programs geared for children are usually most popular and especially attractive to families.

Some developed camping areas offer a tent camping area. These primitive settings offer opportunities for a backcountry experience for many urban youth that may otherwise never have that opportunity. Local churches or youth organizations will be interested in camping programs for teens that build confidence. These programs usually focus on preparing and planning ahead for camping or learning about gear and tools for camping. Other programs will focus on getting in touch with nature and the spiritual aspects of nature. Popular interpretive programs might include campfire programs with music and sing-alongs.

Partnerships

Usually campgrounds are operated for a profit and opportunities for partnerships or volunteer programs are somewhat limited. However there are some elements of a campground that lend themselves to partnerships such as volunteer campground hosting and interpretive programs or interpretive trails.

Volunteer campground hosts provide a friendly face, and an on-site individual to greet visitors, collect fees, inform and direct visitors to campsites, perform day to day maintenance, clean restrooms, and man fee entry stations. In exchange the host receives a free campsite with electric, water and sewer hookups. Hosts are often retired couples that own their own RV, wish to remain active, and enjoy traveling.

A Campground Host sign should be placed to clearly show visitors where the host campsite is located. First names of hosts can be used on the sign to make visitors more comfortable and to make the host more approachable. There are several organizations nationwide that act as a network to match prospective campground hosts with a position at a campground. The Good Sam Club offers a website for RV enthusiasts and outlines a volunteer program where individuals can sign up to become campground hosts at numerous parks across the nation (http://betagoodsamclub.com).

Trail Construction and Maintenance

This section addresses trail construction and trail maintenance. There are numerous publications available that address trail construction and maintenance and many of them are discussed here. Construction and maintenance are critical issues for trails and each has an effect on the other. Properly designed, located and constructed trails are

generally easier to maintain and easy to manage. The long-term success of the trail depends on the sustainability of the trail. Thought and planning must be put into trail construction and subsequent maintenance and management of the trail. There are many grant funding opportunities for trail construction, but few for trail maintenance.

A well-planned trail system will meet basic objectives including: satisfying the user, protecting the resource, minimizing user conflicts and optimizing cost effectiveness (U.S.D.A. Forest Service, 2007). In meeting those objectives the trails will offer a wide range of activities within the constraints of location, topography and funding. They should also offer a range of opportunities for different skills and abilities; this may be as simple as providing a mix of short and longer loops. Facilities for user safety and convenience should be provided within funding constraints. At a minimum, information on safety, emergency contacts, trail manners to minimize user conflicts, and resource protection messages should be provided on a bulletin board at the trailhead. Encourage participation by users and volunteer groups in planning, construction and maintenance efforts. Foster partnerships with Federal, Regional, State, and local agencies, local businesses and others in the community.

Partnerships are crucial to the success of a trail system. Many partnerships have been formed through Memorandums of Understanding (MOU). Rails To Trails Conservancy has accumulated examples of partnership agreements; between municipalities, municipalities and volunteer groups, between land conservancy or other non-governmental organizations, and more (www.railtrails.org). The mission of the Rails To Trails Conservancy (RTC) is to create a nationwide network of trails from former rail lines and connecting corridors to build healthier places for healthier people. They offer a trail building toolbox at their website addressing everything from management and maintenance to liability insurance.

Planning, Design and Layout

Trail planning generally begins with a good map showing topography (U.S.D.A. Forest Service, 2007). An aerial photo is also helpful. The map and photos are used to plan the potential route and to identify the control points or places the trail has to go because of destination points, trailheads, water crossings or other areas. In general trails are located parallel to contour lines. Grades for downhill and uphill sections should not exceed 10%: for every 100 feet traveled along the trail the trail will not exceed an elevation change of 10 feet. On-the-ground verification is essential to proper location.

Trail design is an art that takes time and experience; it will involve equipment including a clinometer, compass and GPS receiver, flagging, a field notebook, and maps (U.S.D.A. Forest Service, 2007). The clinometer is used to establish the grade or slope of the trail. The compass is used to determine the direction of the trail. The GPS receiver will help in marking the trail on a map when back in the office. Flagging is used to mark the centerline of the trail corridor; it should be placed at about eye level. If you are working in an open area without trees or vegetation use pin flags instead of flagging to mark the

proposed route. The purpose of the scouting the route is to verify control points, identify additional control points not seen on the map, verify that the route is feasible, find the best alignment. Run or walk the trail to check the flow before you begin cutting vegetation or dirt work.

Horseback Riding Trails

Each type of trail has its own maintenance needs yet the overwhelming need is to move water off the trail, and this is common with all trail systems. All trail users have an impact on trails yet equestrians are frequently criticized for ecosystem damage. All trails are constructed by humans and are placed in an ecological context. Therefore, an understanding of the ecosystem is important for trail builders. Recreational Horse Trails in Rural and Wildland Areas (Wood, 2007) addresses design, construction and maintenance techniques specifically geared to equestrian trails. The book is guided by three important goals: trails must be safe for the user, be ecologically sound and economically sustainable.

When designing and constructing trails a knowledge of the ecosystem within which the trail will be located is a necessity (Wood, 2007). An ecosystem is defined as a biotic community or assemblage of living things embedded in its abiotic environment as defined by its geology, soil, water, climate, and topography. Interactions between plant, animals, and microorganisms and their abiotic environment result in a flow of energy and nutrients through processes such as photosynthesis, foraging, fire, and decay. Disruption of this ecosystem dynamics is called fragmentation. Biodiversity is an ecosystem characteristic defined as an array of species and processes. It may be naturally high, such as in a rainforest, or naturally low, such as in a desert. Ecosystems are characterized by a range of capacities to withstand disturbance without undergoing major change. Systems that cannot withstand disturbance are fragile while those that can are robust. Cumulative effects are related to the concept of ecosystem capacities; while a single disturbance may not cause a significant adverse effect a series of disturbances can.

One of the major ecological characteristics that will influence the location, design and construction of a trail is soil (Wood, 2007). Soil is a highly complex ecological mix that has evolved over long periods of time during which it was shaped by the interactions of physical, chemical and biological processes. The four most important properties of soil, in terms of trail construction and maintenance, include: texture (sand, clay or silt), drainage, structure, and bulk density. Soil texture is a term describing the mixture of mineral particles by percentages of sand (0.05 – 2.0 mm), silt (0.05 – 0.002 mm), and clay (less than 0.002 mm). Light textured soils are those with physical properties determined primarily or entirely by the sand component. Medium textured soils are typically loams with substantial proportions of at least two primary particle sizes. Heavy textured soils are those with physical properties that are determined primarily by the clay component.

There are two types of soil drainage: vertical and surface. Surface drainage relates to how water moves across the surface of the soil (Wood, 2007). Vertical drainage refers to how water moves vertically or percolates through the soil profile. The rate at which water moves through or accumulates defines its drainage characteristics. Drainage classes range from very poorly drained to excessively drained. Soil structure is the arrangement of soil particles into aggregates or clumps of soil. The four primary types are: prismatic, columnar, blocky and granular. Bulk density is the dry weight of a unit volume of dry soil and is expressed in grams of soil weight per cubic centimeter of soil volume. Sandy soils have higher bulk densities than fine textured soils such as clay.

Trail design goals generally include user safety, environmental soundness and financial sustainability. These goals should guide design, construction, maintenance, and regulation of trail systems. Often high maintenance costs are the result of poor design and construction. Trails must be designed to fit the ecosystem. Safety considerations include road crossings, stream crossings, bridge crossings, corridor dimensions, tread conditions (Wood, 2007). Ecological considerations include: erosion prevention, water quality protection, protection of sensitive resources such as wildlife and plants. Economic considerations include optimizing initial construction costs with future maintenance costs.

Wetland Trails

This section addresses trail construction in wet areas. While most trail crews will try to avoid wetland due to construction and maintenance problems there are some techniques for building wetland trail. Wetland Trail Design and Construction (USDA Forest Service, 2001) gives a good overview of wetland types, trail structures and construction materials.

In northern locations one can find wetlands formed by glacial actions; these include narrow areas in a mountain valley. Wetlands with organic silt and clay soils may be the most common wetland; the terrain traps the runoff and the soil particles hold the water making the area soft underfoot (U.S.D.A. Forest Service, 2001). River deposits and deltas form yet another wetland type; soil deposited along rivers and their deltas may include inorganic clay and an extremely high percentage of water. Floating wetlands are another type of wetland and is the result of water-tolerant sedge and sphagnum moss invading lakes; plants such as pitcher plants, cranberry and blueberry are indicators of these. Carrs are wetlands found in mountainous areas which may become apparent only after trail use; indicator plants include river birch, shrubby willows and alders. Some wetlands are caused by subsurface water that seeps to the surface from a perched water table; precipitation that would normally percolate deep into the soil is trapped near the surface and follows the slope of an impervious layer.

At least eight types of structures are commonly built in wetlands (U.S.D.A. Forest Service, 2001). Some are built with no foundation while others have sleepers (sills), cribbing, or piles as foundations. Most are built of wood. The oldest methods of

building a wetland trail were corduroy and turnpike. Corduroy involves placing two log stringers spanned by small diameter logs or half logs; in some cases stringers were not even used and the logs placed directly on the ground. Corduroy did not represent a sustainable design and is rarely used today. Turnpikes are used to elevate the trail above the wet ground by using material from parallel side ditches to raise the trail higher than the surrounding water table. A causeway is a more environmentally friendly version of the turnpike without side ditches; rock is carried to the site to raise the trail above the water table; geotextiles can be used to prevent sinking. Drainage improvement devices include dips (or ditches), open drains, French drains (underdrains), and culverts.

Geosynthetics are synthetic materials usually made from hydrocarbons that are used with soil or rock in many types of trail construction. Geosynthetics for Trails in Wet Areas (U.S.D.A. Forest Service, 1995) gives a good overview of the many alternatives available.

Structures requiring foundations include puncheons, bog bridges, gadbury, and boardwalks (U.S.D.A. Forest Service, 2001). These all require a structure to keep them off the ground. Sleepers (sills) are the simplest foundation where tread plank or stringers rest on stringers. Sleepers are used to support puncheon, gadbury, and bog bridge construction. A sleeper is placed in a shallow trench at a right angle to a centerline. A second sleeper is placed in another trench parallel with the first sleeper. The distance between the two sleepers is the span. Pinning the sleepers to the ground requires extra work but may reduce future maintenance in wetlands subject to flooding. Pinning is most important near rivers where high water velocities may occur during flooding. The drift pins should be driven into holes drilled at opposing angles. Timbers are sometimes used instead of logs; they are easier to work with as they do not require notching. Precast concrete may be used but they are far from rustic in appearance; weighing as much as 150 lbs per cubic foot, they may be too heavy to bring to the trail site and, in most wetland soils, they will eventually sink into the ground.

Log or timber cribbing can be used to support a trail when crossing a low wide area. Sleepers are placed in parallel trenches and diagonally pinned into the ground with 30 inch pins (U.S.D.A. Forest Service, 2001). Each layer of logs is placed at right angles to the one below until the proper height is reached.

Piles are another foundation technique (U.S.D.A. Forest Service, 2001). Three types of piles have been used in wetland trail construction. Structural engineers refer to these as end-bearing piles, friction piles, and helical piles. End-bearing piles are used at locations where firm earth or solid rock is found 2 to 10 feet below the ground. Piles can be used to support the tread at abrupt changes in grad when the treat must be 1 to 5 feet above the ground or water. Piles can also support handrails. To place and end-bearing pile, excavate a hole a little wider than the pile to a point below the frostline. Place the pile upright and plumb in the hole. Place the earth in the hole equally and compact it using

a tamping bar. The piles can be made from rot-resistant or pressure treated wood, steel, or concrete. Connections to wood piles are much easier to make.

Friction piles are normally used when the ground is wet and sloppy where you need logs, or some kind of deck, to stand on while you work (U.S.D.A. Forest Service, 2001). Friction piles are usually at least 12 feet long and 10 to 12 inches in diameter and are heavy and awkward to transport. A point is cut on the narrow end and the pile is driven into a shallow hole with the wide butt end up. Usually the pile is driven about 6 to 10 feet into the ground. The principle is that the deeper the pile is driven the more friction is developed.

Once a pile is in place a second pile is placed on the opposite sides of the trail. When both piles are in place, they are connected by one of two ledgers. The combination of ledgers and piles is called a bent.

Helical piles, or screw piles, are a recent adaptation of an old construction technique using screw anchors (U.S.D.A. Forest Service, 2001). Screw anchors where originally used in poor soils, often with cable guy lines. The design of the screw anchor was modified to be used as a helical pile. Helical piles are now used to support anything from utility poles to large buildings built on poor wetland soils. They are an excellent alternative to friction piles weighing less, being easier to install, and resulting in less ground disturbance and lower overall cost.

Puncheons are essentially short-span footbridges or a series of connected short-span footbridges (U.S.D.A. Forest Service, 2001). Puncheons on the Appalachian Trail are not the same as puncheons in the Cascades or Rockies. They can be used where the soil is wet but does not contain enough water to seriously hamper trail work. The one thing common to all puncheon construction is the use of sleepers or sills.

The type 1 puncheon is a rustic type of puncheon using stringers and tread logs (U.S.D.A. Forest Service, 2001). They are used on the Appalachian Trail where 3 to 6 foot long logs are commonly used for the sleepers. They are notched to receive one or two tread logs and then placed in a shallow trench. If the area to be crossed is longer than the logs available for the tread, the puncheon can be built as a series of connecting sections. Hiking any distance on single-tread-log puncheon can be unnerving because the hike is looking down to avid stepping off the tread.

The type 2 puncheon uses stringer and decking and is found in the Western States. This type uses log sleepers placed in a manner similar to Type 1 but the sleepers are a few feet long, however, the space between them is spanned by two or three log stringers or beams spaced 1 to 3 feet apart.

The third type of puncheon also uses sleepers to support the structure but the material is sawn timber or lumber which should be treated with wood preservative. This

construction is popular with more accessible sites where materials are easier to transport.

Gadbury, a structure similar to puncheon, was developed in the Pacific Northwest (U.S.D.A. Forest Service, 2001). Gadbury uses two half logs, as described for puncheon, and longer notched sleepers. The notch cut for gadbury must be about twice as wide as the notch cut for puncheon. Two half logs are placed on each side of the center of the notch with the flat surface up. Two full logs are placed in the notch on the outside of each of the half logs.

Boardwalk is a structure that uses widely spaced bents or piers as a foundation (U.S.D.A. Forest Service, 2001). Stringers, parallel with the centerline of the boardwalk, rest on the ledgers of the bents or piers. The stringers support the deck, which is usually 2 by 6 or 2 by 8 lumber laid perpendicular to the centerline and nailed or screwed to the stringers or to nailers bolted to the stringer. Boardwalks usually have a curb or handrail along their edges. Basically a boardwalk is a series of connected bridges, each with a span as long as is practical.

RECREATION SIGN PLAN FOR THE GREAT TRINITY FOREST

Signs are an important part of a managed outdoor recreation experience. Signs should be visible and clear enough so that visitors know their location, know the rules of the area, and receive interpretive messages clearly and easily. Regulations or prohibitions should be simply and clearly stated. When signing is overdone it tends to be ignored and it is not as effective at reaching the visitor. This section will address the sign plan for recreation and interpretive signing.

Planning is important to orderly, consistent and cost effective signing. A sign plan will identify the signs needed so that unnecessary signs are not installed. The plan also provides a focus for what the signing should accomplish. The plan will assist the manager with new installations, replacement, and maintenance. The first section of the plan will address the inventory, the second section will address evaluation, the third section action plans and the last section will cover documentation.

The Trail Construction and Maintenance Notebook, 2007 Edition (U.S.D.A. Forest Service, 2007) addresses trail signing (p 125-133) and offers diagrams on how to install signs and reassurance markers and blazes. This document is available at the website or hardcopies can be ordered for volunteers.

Sign Plan - Inventory

A sign inventory is an all inclusive listing with a complete description of existing and planned signs, posters, their supports, locations, condition, maintenance and inspection dates, and a periodic evaluation of effectiveness. The description should be sufficient to allow reordering of a damaged or stolen sign. Each sign should have an identification number and a record should be kept showing the sign material, message, and letter size. The inventory will be useful in the preparing annual evaluations or in preparing work lists for ordering and replacing signing.

An example of information included in a sign inventory is shown below:

Unique ID #: Each sign should have unique identifier.
Size: In general 5” x 7” signs will suffice for hiking trails, while 12” sq. signs are needed for bicycle or horseback riding trails. Sign size is based on viewing distance. In general, 1-inch letters for signs along hiking trails is sufficient. Hiking trails do not require reflective signing; wood painted or routed signs are sufficient. Bicycle trails require 2-inch letters on signing and all signing should be reflective if the trail is open after dusk, for example, reflective white letters on a brown background. Where signs are used to indicate a road or trail crossing, the sign should definitely be reflective.
Panel Type: aluminum or wood
Sign Language: complete message of the sign
Letter size: 1” letters for hiking trail signs, 2” letters for bicycle or horse trails.

Post: Sign supports can be posts or trees. When trees are used, limbs should be pruned well above the sign so they will not obscure the sign. Support posts should be noted as wood, flexible, fiberglass, stone, or wood. Usually 5' posts are used for hiking, mountain bike, or horseback riding sign posts; minimum lateral distance from trail tread is 3' for hiker or horse trail and 3' to 6' for bicycle trails.
Viewing Distance:
Photographic Record:

Sign Plan - Evaluation
Signs should be evaluated on a periodic basis, usually annually. The evaluation can compare existing and planned signs to develop an action plan. The following is an evaluation checklist. Volunteers can use the inventory list to check existing signs.

Sign #:
Present/Missing:
Sign in Proper Location: Y/N
Sign Installed Correctly: Y/N
Good/Fair/Poor Condition:
Appropriate Message: Y/N
New Signs Compatible with Existing: Y/N
Comments/accidents/ to indicate problems: Y/N
Overall Effectiveness:
Too many/confusing/conflicting signs:

Monitoring sign effectiveness can be accomplished through visitor contacts, suggestions, as well as direct observation of effectiveness. An annual action plan can be completed to assess safety, user appropriate message, resource protection effectiveness, liability, law enforcement needs. Part of the annual action plan should result in documentation of the above mentioned items.

Sign Plan -Annual Action Plan

Based on the inventory and evaluation above, an annual action plan can be developed for ordering and installing new additional or replacement signs, removing obsolete signing, and maintaining existing signing. Involvement with other experts including: law enforcement, resource protection specialists, users (in order to determine their needs), or safety considerations may be warranted.

Action Plan items include:
- Ordering or installing new or replacement signs
- Removing obsolete signs
- Maintaining signs
- Planned actions

- Schedules
- Responsibilities
- Estimated costs
- Available funding and workforce

Sign Plan - Documentation

All inspections, installations, removals, and maintenance should be documented as completed. Problems with certain signs such as vandalism should be recorded when they are reported. Proper documentation will aid in future signing needs, budgeting, and resolving litigation that may involve signage.

Trail Signing

This section will address proper placement and common types of signs, and locations for trail signs. Trail signs perform a variety of functions including route identification, distances to points of interest or back to the trail head, safety reminders or hazard warnings, route reassurance markers, notice of regulations or restrictions, and protection of resources. Guide signs show distance to destination points, loops and trailheads.

Route identification signs will display the trail name or segment. Often a color coded aluminum triangle can be nailed directly to trees to indicate the trail segment. At key points a trail name sign may be needed. Color coded trail segments should tie back to the trail map at the trailhead and smaller maps given out to the trail users. This will aid the users in determining where they are along the trail.

Distance to a key point of interest or back to the trail head will be needed at certain points along the trail. In this way users can determine if they have the time to continue or if they need to return to the trail head.

Safety reminders or hazard warnings might include information on a trail segment closed for maintenance or a bridge temporarily closed for construction. Difficult trail loops or segments can be signed to allow the user to continue or to avoid a difficult trail.

Route reassurance markers may include blazes or aluminum tags to assure the user they are still on the designated trail. Generally signs addressing regulations or restrictions, and protection of resources are confined to the trailhead.

Signs along paved bicycle trails or trails that are coincident with roads should be reflective. Regulatory or warning signs should be a minimum of 18” square, with 2” lettering, along these trails while more primitive bicycle trails may suffice with a 12” square, with 2” lettering.

Guide signs identify the trail and give direction and guidance to destinations. They are usually located at the junction or just in advance of the junction. Route identification includes the trail name, number, or both, and the trail direction. For example the following indicates the Oak Grove Trail, or Trail No. 2 is located to the right and the trailhead is located in the same direction, at a distance of 5 miles.

OAK GROVE TRAIL NO. 2 

OAK GROVE TRAILHEAD 5

Locations commonly calling for signs include trail termini, junctions with other trails or roads, special management areas, rivers or natural features identified on maps or trail

guides, and interpretive opportunities. Signs at trail termini usually note the name of the trail, distance to destination points, and some indication of miles traveled or miles to the trailhead. Where two distinct trails cross, some indicator of use allowed (hiking, bicycling, horse) is helpful. Universal signing showing a hiker, a bicycle and a horse is best; it is easily understood, more attractive, and understandable in any language.

Use of a self locator map is appropriate at a trail junction to provide an extra measure of orientation and security. The map should clearly display the trail system and the user's location, with a "you are here" arrow.

Reassurance markers reconfirm that the user is in the correct location. Trails can be marked with signs, blazes, or cairns as appropriate. Route markers provide minimum information necessary to reconfirm trail identity. Carsonite, a trail signing company, offers flexible, durable posts that would work well and are reasonably priced. Use the minimum number of route markers necessary. Where vandalism is a problem place the route marker a short distance along the trail, out of sight from trail beginnings or road crossings. Blazer reassurance markers are usually painted, but can also be cut into the tree, to indicate the route. The downside of cut blazes is they cannot be removed should the trail be relocated at some future date or if the blaze is placed improperly. Blazes are generally place at 5' in height on the right hand side of the trail but visibility is the primary concern in placement of the blaze. Metal or plastic diamond shaped signs, with or without an arrow, can be used in lieu of cut or painted blazes. The metal diamonds can be purchased in different colors, or in reflective material for bicycle trails or any trail that may be used at night. Cairns are used in rocky, treeless areas as necessary for guidance and safety. Rocks are selected and placed to form a pyramid form roughly 30" in width and about 3' in height.

Trail sign placement and installation is critical to the safety of the user, the visibility of the sign, and to provide adequate clearance for the trail traffic. Signs will be placed on posts or on trees at a minimum height of 5 feet and are typically mounted 2 to 6 feet to the right of the trail tread, depending on the setting, trail use, and visibility needs. Placement from the trail tread will be a minimum lateral distance of 3 feet for horseback riding trails, and 2 to 6' for bicycle trails. Signs are placed perpendicular or parallel to the trail direction.

Signs should be ordered with pre-drilled holes and mounted with zinc-plated lag screws or bolts. Vandal resistant hardware should be used where sign theft is a problem. Maximize opportunities to limit signs to one panel or, at most, two panels. When wood posts are used position the top of the sign two inches below the top of the post on the side in contact with the sign. The top of the post should be rounded or sloped 45 degrees away from the face of the sign. When round posts are used consider notching the post to facilitate mounting the sign. When trees are used, prune limbs well above the sign to limit drooping limbs from obscuring the sign. Choose trees that are close to

the trail, are in a direct line of sight, and have the best light exposure to improve visibility.

When trails cross each other, or roads, there is a potential for accidents. Determine the need for intersection control, warn of hazards, and consider stopping distance in sign placement. Road crossing signs should be coordinated with the governing road agency. In most cases a stop or yield sign is not needed but each situation should be examined on a case-by-case basis.

Sign materials are generally determined by budget as well as the setting of the trail and the trail use. Sign materials can be wood, metal, fiberglass, or synthetics and often depend on the use of the trail, the scenic objectives, the travel speed, viewing distance, and nighttime visibility needs. Signs may have routed or painted letters which can be reflective if needed. Reassurance markers are usually blazes cut or painted onto trees but aluminum markers can also be used. If there is any possibility that the trees may be used as lumber, aluminum nails should be used so the logs can be safely sawed.

Minimum letter size (in inches) varies depending on the distance from which the sign is viewed and the normal rate of travel, or desired speed, of the trail. For pedestrian and horseback riding trails, 1-inch letters are adequate for most viewing situations. The minimum size letter for bicycle trails is 2-inches, and these should be reflective.

Regulatory information should be provided at the trailhead. Stress education over restrictions and minimize prohibitory language. For example “leave rocks and flowers for others to enjoy” rather than “taking rocks or picking flowers is prohibited.” Explain restrictions in easily understood terms such as resource benefits or user safety.

Campgrounds require signing at the main entry point identifying the area. The campground identification sign would state the name of the campground and the managing agency. The entry station signing includes fees, rules, a map of the campground, directional signs for campsites identified by campsite number. Generally campgrounds are closed to the general public and visitors from 10:00 p.m. to 6:00 a.m. except for campers. Camping loops are usually identified by a name or letter; for example;

CAMPING LOOP A ➡
Units 1-35.

In addition, regulatory signing such as speed limits may be needed. An engineering study may be needed to determine the appropriate speed limit for the road condition and situation.

Interpretive signs are the most popular form of offering an interpretive message to the visitor. They can be used for self-guided trail or to explain points of interest along a trail

including: wildlife viewing areas, scenic overlooks, or ecosystem management areas. Interpretation is defined by the National Association for Interpretation as a communication process that forges emotional and intellectual connections between the interests of the audience and the inherent meaning of the resource. Interpretation brings meaning and interest for a subject to the visitor; it should be enjoyable, relevant, and have a message for the visitor.

A successful interpretive sign can move visitors to make positive behavioral changes and to instill stewardship in the land and the natural resources. In determining whether or not to place a detailed interpretive panel consider: the number of visitors that will see the sign, whether or not overuse of signs is a concern in the area, whether signing is the best medium to relay the message, and if there is sufficient budget to purchase, install, and maintain the sign. Interpretive signing involves planning, design, fabrication and installation. Interpretive sign planning is a decision-making process that blends a story about a given resource with management needs and site considerations to enhance the visitors' experience. The agency's mission and purpose should play a significant role in developing interpretive themes.

Three critical components must be addressed in developing interpretive sign plans: the message, the audience and the resource. The message is a statement summarizing what you want to convey about the site. The audience is an important consideration in order to communicate successfully; bilingual signing is a must. The resources and funds available will dictate the kinds and number of signs that can be considered.

Trailhead Signing

This section recommends signing for the eight planned trailheads as shown on diagram 1, Trailhead locations planned for the Great Trinity Forest. Each trailhead should have a visitor information station, sometimes called information kiosks. They contain information that:

- Familiarizes recreationists with the site or trail
- Discusses facility use, trail condition, and safety
- Provides instruction regarding rules, regulations and etiquette

Permanent sign panels or bulletin boards with one to three panels are usually adequate. While some information is useful to recreationists before they arrive, other information is important at the trailhead.

Spine Trailheads

Trailhead 1, located at the northwest corner, and Trailheads 4 and 7 accessing spine trails to the east and northwest. It is recommended that signing at these locations offer a clear map of the trail showing "you are here." It would be a good idea to have smaller maps that the visitor can take with them along the trail. Emergency contact numbers, contacts for comments or suggestions, such as a website, should be noted. Basic trail

safety messages should be included. Partners or sponsors of the brochures, maps, or bulletin boards should be mentioned.

The following is a recommended list of prohibitions to be considered for trailheads.
Trail Rules Prohibit the Following:

- Being on trails or at trailheads between 10:00 p.m. and 6:00 a.m.
- Camping along trails or at trailheads
- Possessing or operating motorized vehicles along trails or at trailheads
- Parking outside of designated parking areas
- Possessing or discharging fireworks
- Possessing an open container or consuming alcoholic beverages
- Building a fire
- Fighting, or making loud noises
- Interfering with or threatening a volunteer
- Public nudity
- Possessing or using a metal detector on or within an archeological, historic or prehistoric site
- Discharging a firearm

<u>Bicycle Trailheads</u>
Trailheads 2 and 3, both located at the northern end of the Great Trinity Forest, offer access to the spine trails and the wildlife habitat maintenance trails. It is recommended that signing at this location offer the same type of information as at Trailhead 1.

1. Ride on Open Trails Only

Respect trail and road closures; avoid trespassing on private land; obtain permits or authorization as needed or required

2. Leave No Trace

Be sensitive to the dirt beneath you. Recognize different types of soils and trail construction; practice low-impact cycling on trails more vulnerable to damage. When the trail bed is soft consider other riding options. Don't create switchbacks. Be sure to pack out all that you packed in.

3. Control Your Bicycle!

Inattention for even a second can cause problems. Obey all bicycle speed regulations and recommendations.

4. Always Yield Trail

Let fellow trail users know you are coming. A friendly greeting or bell is considerate and works well; don't startle and show respect when passing by slowing to a walking pace, or even stopping. Anticipate other trail users around the corners, establish communication and be prepared to stop if necessary.

5. Never Scare Animals

All animals are startled by an unannounced approach, a sudden movement or a loud noise. Give animals extra room and time to adjust to you. When passing horses use

special care and follow directions of horseback riders (ask if uncertain). Disturbing wildlife is a serious offense.

6. Plan Ahead

Know your equipment, your ability, and the area in which you are riding and prepare accordingly. Be self-sufficient and have your equipment in good repair. Carry necessary supplies for changes in weather or other conditions.

By using signing and messages created and supported by nationally recognized and organized user groups, such as IMBA, it is more likely that users will respect and heed the message.

Horse Trailheads

Trailhead 5, 6, and 8 are closest to the horse facilities. Visitor information kiosks at these areas will address potential user conflicts and offer methods for bikers and hikers to approach stock on the trail. Often a traditional yield sign noting the hiker, biker and horse in the three corners and arrows denoting who yields to who is simple, clear and has a universal message.

ATTENTION MOUNTAIN BIKERS

1. Speak up or use a bell as soon as you see or hear others on the trail. Let them know you are there.
2. Slow down when passing. Pass no faster than twice the speed of who you are passing.
3. When a horse is coming your way stop, step of the trail, and speak to horse and rider.
4. Yield the right-of-way to all other trail users.
5. Don't ride here if the trail is wet enough to leave ruts and tracks.
6. Stay on the trail.

Horse riders will want to know the following general information.

General Information

	INFORMATION	SIGNS	HAND-OUTS	CRITICAL	DESIRABLE
General Information	Location of equestrian facilities (parking, camping, water sources, hitching or confinement areas, manure disposal, accessible mounting ramp)	x	x		x
	Size restrictions for horse trailers	x	x	x	
	Method of manure disposal	x	x	x	
	Regulations regarding weed-free feed	x	x	x	

	Horse use restrictions (designated roads, parking pads, horse areas, and trails)	x	x	x	
	Tethering restrictions (types of gear, number of stock)	x	x	x	
	Prohibitions (excessive noise, barking dogs, or other)	x	x	x	
Trail Conditions	Trail length	x	x	x	
	Typical and maximum trail grades	x	x	x	
	Typical and minimum tread width	x	x		x
	Trail surface material	x	x	x	
Obstructions	Location of water crossings	x	x		x
	Location of stepover gates	x	x		x
Facilities	Location of stock watering sources	x	x	x	
	Location of toilets	x	x		x
Safety	Presence of dangerous predators/snakes	x	x	x	
	Presence of vegetation toxic to stock	x	x	x	
	Areas impassable by stock	x	x	x	
Etiquette	Intended trail users	x	x	x	
	Trail user with right-of-way (stock, bicyclist, or hiker)	x	x	x	
	Bicyclist instructions for approaching stock	x	x	x	
	Hiker instructions for approaching stock	x	x	x	

Recommendations for a sign addressing rules and regulations are addressed below.

RULES AND REGULATIONS
Horses

- No horses or gear will be tied to trees or other places not designated
- Tether lines are provided for two horses only
- Portable corrals may be used under tether line or behind trailers
- Please remove all manure. Manure may be deposited in the dumpsters (if provided) or hauled to a sanitary landfill
- All horses must be kept under physical control at all times

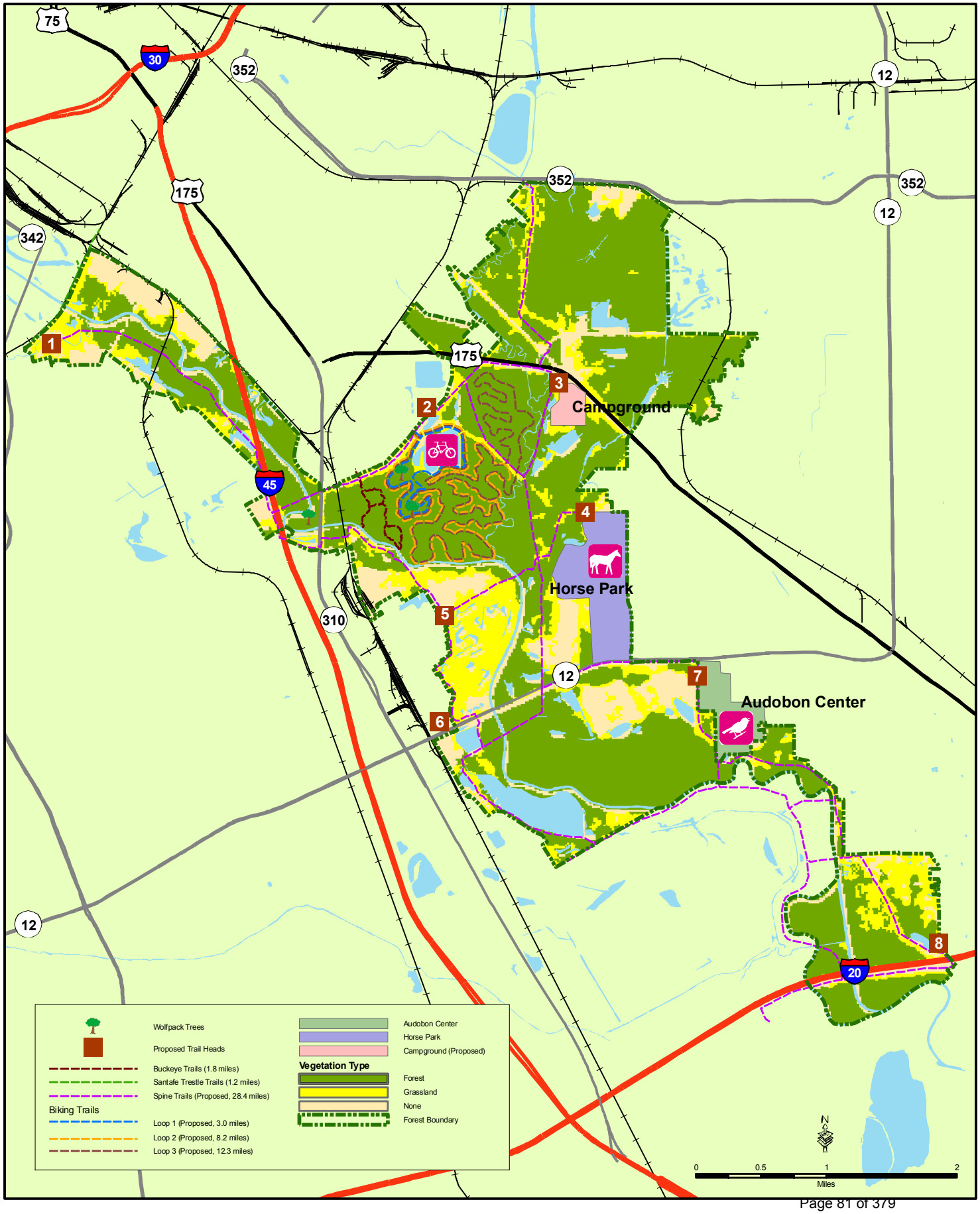
Pets (other than horses)

- Pets are welcome but must be kept under physical restrictive control at all times; this means caged or on a leash no longer than six feet

Vehicles

- Trailers longer than 35 feet are prohibited

Great Trinity Forest - Recreation



INTERPRETATION

Planned seasonal interpretive programs should focus on hands-on programs for children and involve a variety of wildlife. Examples include: netting and tagging songbirds, collecting identifying and releasing insects, building bluebird houses and monitoring the nests throughout the year, fish shocking, water quality testing through examining water insects or microinvertebrates, study of soil layers by digging and later filling small pits, leaf collecting and identification, identifying animal footprints through mold-making and other programs geared for children of varying ages.

The year-round trail system will offer interpretation through signing and brochures. The hardened-surface spine trail system offers opportunities for hiking and will focus on the tree species, understory vegetation and flowering plants. The natural surface horseback riding trail will offer a safe, family-oriented riding trail for riders of different abilities. Bicycling trails will offer safe, family-oriented trails for various skill levels.

The Basics of Interpretation

Interpretation is the act of explaining what is not immediately plain or explicit by pointing out or suggesting inner relationships or motives or by relating particulars to general principals (Interp Guide, U.S, Dept. of the Interior, National Park Service).

Freeman Tilden, in Interpreting our Heritage, defines interpretation as "an educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information (Interpreting Our Heritage, Freeman Tilden, University of North Carolina Press, Chapel Hill, 1957)." He goes on to explain that the true interpreter will not rest at the dictionary definition but will go beyond the apparent to the real, beyond a part to a whole, beyond a truth to a more important truth. He offers, for contemplation, the statement that interpretation is the revelation of a larger truth that lies behind any statement of fact. And further suggests that interpretation should capitalize mere curiosity for the enrichment of the human mind and spirit. Tilden offers six principles of interpretation. (1) Any interpretation that does not somehow relate what is being displayed or described to something within the personality or experience of the visitor will be sterile. (2) Information, as such, is not interpretation. Interpretation is revelation based upon information. But they are entirely different things. However, all interpretation includes information. (3) Interpretation is an art, which combines many arts, whether the materials presented are scientific, historical or architectural. Any art is in some degree teachable. (4) The chief aim of interpretation is not instruction, but provocation. (5) Interpretation should aim to present a whole rather than a part, and must address itself to the whole man rather than any phase. (6) Interpretation addressed to children (up to the age of twelve) should not be a dilution of the presentation to adults, but should follow a fundamentally different approach. To be at its best it will require a separate program. The following explains these principles in further detail.

Interpreters Must Relate the Information to Their Audience

There are, of course, numerous reasons why people visit parks. The interpreters' first question should be "what will be the visitor's chief interest while he is with us?" The visitor's chief interest will be whatever touches his personality, his experience and his ideals (Interpreting Our Heritage, Freeman Tilden, University of North Carolina Press, Chapel Hill, 1957). The visitor will prefer to be talked with rather than talked at. Since this is not possible it will have to be achieved in an indirect way. The visitor's interest will be in something that concerns himself. C.E. Merriam in his book "The Making of Citizens" indicated the strength of the urge of man to associate himself with the historic past. …

> "The underlying design is of course to set up a group of the living, the dead, and those who are yet unborn, a group of which the individual finds himself a part and of which hi is in fact glad to count himself a member, and by virtue of that fact an individual of no mean importance in the world. All the great group victories he shares in; all the great men are his companions in the bonds of the group; all its sorrows are by construction his; all its hopes and dreams, realized and thwarted alike, are his. And thus he becomes although of humble status a great man, a member of a great group; and his humble life is thus tinged with a glory it might not otherwise ever hope to achieve. He is lifted beyond and above himself into higher worlds where he walks with all his great ancestors, one of an illustrious group whose blood is in his veins and whose domain and reputation he proudly bears. " (Chapter 2, Freeman Tilden, Interpreting Our Heritage. The University of North Carolina Press, Chapel Hill, 1957).

Interpreters have been referred to as the "middlemen of happiness" (Interpreting Our Heritage, Freeman Tilden, University of North Carolina Press, Chapel Hill, 1957). Of course, it is impossible for anyone to make someone else happy; happiness is hard to find within ourselves and impossible to find elsewhere. Generally speaking, certainties contribute toward human happiness while uncertainties are a source of spiritual loneliness and disquietude. Whether conscious of it or not, man seeks to find his place in nature and among men. Parks, archeological ruins, botanical gardens, historic areas are all places where this ambition is likely to be satisfied.

If the interpreter cannot connect to the visitor's personal experience, thoughts, hopes, way of life, social position or whatever else you will have lost his interest (Interpreting Our Heritage, Freeman Tilden, University of North Carolina Press, Chapel Hill, 1957). Even signs, labels can help the visitor feel a direct connection. An example of this is a label found in the Witte Museum in San Antonio, Texas on a large case containing the skeleton of a mammoth. "Prehistoric mammoths were here in Texas just a few thousand years ago. They roamed the plains in great herds……The chances are that they browsed right where you are standing now. "

Another example of associating the object with some sense of drama can be found at the Franklin Delano Roosevelt homesite in Hyde Park, New York (Interpreting Our Heritage, Freeman Tilden, University of North Carolina Press, Chapel Hill, 1957). In the room where the President was born one could put up a label stating President Roosevelt

was born in this room. Although that is accurate information, a more personal contact can be offered such as ….what you see is a reproduction of the telegram sent by the happy father, James Roosevelt, to a friend announcing the arrival in Hyde Park "of a bouncing boy, weighing 91/2 pounds." Instantly the visitor feels a kinship with the Roosevelts and with the whole mansion and area.

The visitor is ultimately seeing everything through their own eyes, their own experiences, and they are constantly interpreting, as best they can (Interpreting Our Heritage, Freeman Tilden, University of North Carolina Press, Chapel Hill, 1957). Therefore, it is important to make the translation as easy as possible. Words like dendrochronolgy, photosynthesis and biota do not help although there may be a few that would be interested in a visual interpretation of these concepts. In interpreting history, provoking the thought, "under like conditions what would I have done?" usually works well. Thomas Henry Huxley, one of the greatest biologists of all time, delivered a series of lectures to Workingmen's Institutes in a series of English cities. One of these talks was delivered in Norwich. Huxley called it "On a Piece of Chalk." It became a classic of English style. His opening word: "If a well were sunk at our feet in the midst of the city of Norwich, the diggers would very soon find themselves at work in that white substance almost too soft to be called rock... with which we are all familiar as 'chalk." The audience is immediately made a part of all that is to follow. It is a discovery that they are about to participate in with the interpreter as the guide.

Information and Interpretation are Two Different Things

Interpretation is revelation based upon information, but they are entirely different things (Chapter 3, Freeman Tilden, Interpreting Our Heritage. The University of North Carolina Press, Chapel Hill, 1957). When Adolph Ochs was the owner and manager of the New York Times he took what may be termed a purist attitude as to the place of information and interpretation in his newspaper. To him, it was not proper that his reporters should go beyond writing the facts, so far as it is humanly possible to ascertain the facts. Interpretation of the news belonged to the editorial page. This was the ideal of the *Times* under Ochs. The opposite view in the newspaper world, was that of Dana and Laffan of the *New York Sun*. The San Francisco earthquake of 1906 supplied a fine test of the two journalistic points of view. The *Times* strove diligently in its news columns to maintain its ideal. But the *Sun* had on its staff a brilliant newspaperman named Will Irwin; the "news" story written by Irwin will always be a classic of journalism. He poured out his heart in a story that interpreted the very essence of the city where he lived. The audience, the reader of the *Sun*, saw, felt, heard and lamented the loss that had instantly become theirs. This was interpretation; not the facts but the revelation of the soul of a city destroyed by an earthquake.

In many cases the interpreter may and indeed must dispense pure information (Interpreting Our Heritage, Freeman Tilden, University of North Carolina Press, Chapel Hill, 1957). When Charles Darwin made a voyage of nearly five years in a British warship the account of that circumnavigation of the globe was published under the title of *The*

Cruise of the Beagle. Many a person who has never read *The Origin of Species* has taken delight in the *Beagle*. Darwin showed that a man of science can also be a great interpreter. Darwin plainly never confused information and interpretation.

Mark Twain in his book "Life on the Mississippi" showed that he knew what interpretation was. After stating that DeSoto saw the river in the year 1542, Twain wrote:

> To say that De Soto saw it in 1542 is a remark which states a fact without interpreting it; it is something like giving the dimensions of a sunset by astronomical measurements and cataloguing the colors by their scientific names; as a result you get the bald fact of the sunset, but you don't see the sunset.
>
> The date, standing by itself, means little or nothing to us; but when one groups a few neighboring historical dates and facts around it, he adds perspective and color…for instance, when the Mississippi was first seen by a white man, less than a quarter of a century had elapsed sine Francis I's defeat at Pavia; the death of Raphael, the death of Bayard…Catherine de Medici was a child; Elizabeth of England was not yet in her teens….Shakespeare was not yet born…..

Certainly the raw material of interpretation is information. When information is not certain, the interpreter can state that. When opposing hypotheses exist they can both be presented. If questions exist he can present them to the audience.

Interpretation is an Art

Interpretation can be art or science but it cannot be both. If it is an art it can draw upon all science. Dr. John Merriam remarked of Albert Michelson, the physicist, that "it was his lot to be a scientist, otherwise he would have been a great artist." The very fact that Michelson chose to be the one rather than the other is sufficient to indicate that in practice they are not compatible (Chapter 4, Freeman Tilden, Interpreting Our Heritage. The University of North Carolina Press, Chapel Hill, 1957).

Someone referred to education as "knowledge treated imaginatively." Science cannot afford to treat knowledge imaginatively in the sense that the artist can. Dr. John C. Merriam, paleontologist known for his work with the La Brea Tar Pits later became involve with education in the National Parks. Dr. Merriam implied, when he used the work "education," a much higher service than the teaching of facts. He yearned, in our national parks, for an appeal to the emotions, to the hunger for deeper understanding, to the religious spirit of the individual, no less than to the love of beautiful and wonderful objects, or the restoration of physical well being.

The interpreter must use art, and at best he will be somewhat of a poet. We are all in some degree poets and artists. He must dip into his own artistic appreciation, give form and life to his material, and tell a story rather than recite and inventory.

Interpretation is not Instruction but Provocation

Instruction takes place where the primary purpose of the meeting between teacher and pupil is education. The classroom is the outstanding example of this although it can apply to other places. In the field of interpretation the activity is not instruction so much as what we may call provocation. Visitors to National Parks, historic areas and nature preserves frequently desire straight information, which may be called instruction. However the purpose of interpretation is to stimulate the reader or hearer toward a desire to widen his horizon of interests and knowledge, and to gain an understanding of the greater truths that lie behind any statement of fact.

Ansel F. Hall, then Chief Naturalist, of the national park system, delivered a message " to all park educational officers" in 1928. It made clear something that was afterwards misunderstood by many interpreters – that neither the function nor the aim of our interpretation is instruction.

> In most Park educational activities it is best to give the visitor a broad, general idea of the Park in which he finds himself, allowing him to supplement the general but inclusive story with details according to his personal impressions of the facts which he himself gathers out of doors. He may gather these perhaps with your assistance, but he must be stimulated first to *want* to discover things for himself, and second, *to see and understand* the things at which he looks…Remember always that visitors come to see the Park itself and its superb natural phenomena, and that the museum, lectures, and guided trips afield are but means of helping the visitor to understand and enjoy these phenomena more thoroughly…. A few believe it is our duty to tell as many facts as possible, and therefore take pains to identify almost every tree, flower and bird encountered. Others have taken as their motto "to be nature minded is more important than to be nature wise," and feel that it is more important that the visitor carry away with him an intense enjoyment of what he has seen, even though he has not accumulated many facts….

Not the least of the outcomes of interpretation is found in a concise statement in the Park Service Administrative Manual: Through interpretation, understanding; through understanding, appreciation; through appreciation, protection.

<u>Interpretation Should Aim to Present a Whole Rather Than a Part</u>

A cardinal purpose of interpretation is to present a whole rather than a part no matter how interesting the specific part may be (Chapter 6, Freeman Tilden, Interpreting Our Heritage. The University of North Carolina Press, Chapel Hill, 1957). It has been said that the tourist has three limitations: time, absorptive capacity and money. So it becomes important to make of his contact an appreciation of the whole rather than of any part. In describing a bird to an alien it is not sufficient to describe the wing as being much like and arm or that the bird is an insect eater and therefore a friend of the farmer. You could tell him a hundred interesting facts but he would be left wondering what a bird was like. A bird is a small whole, not an assembly of parts and attributes.

It is far better that the visitor to a preserved area, natural, historic or prehistoric, should leave with one or more whole pictures in his mind, than with a mélange of information that leaves him in doubt as to the essence of the place and even in doubt as to why the area has been preserved at all.

An example of interpreting the whole is found at Vicksburg National Military Park. This civil war shrine has great natural beauty yet presumably the visitor is here because of the dramatic long siege that resulted in the surrender of the city to Grant on Independence Day in 1863. Here there are wholes that are far more meaningful to present day visitors than the military strategy and tactics. A whole is found in the story of Missouri, as revealed in this siege and capture. The 11th Missouri regiment, USA, was on one side of the fighting; the 3rd Missouri, CSA, was on the other. From that fact comes the understanding of the human tragedy of brother against brother. It reveals the story of a divided border state with the animosity almost exceeding that of the deep South and North.

The interpreter, whether in wilderness or in historic houses, must always make his appeal to the whole person the visitor represents. If you look upon him as a seeker of information upon some subject you specialize in, you are considering him in part, and that part, at the moment, may want nothing of your wares. If you make your target the whole man who seeks new experience, relaxation, adventure, imitation of friends who have told him "you mustn't miss it"…. You cannot fail to hit.

Interpretation Addressed to Children Should Follow a Different Approach

In explaining the word ecology a naturalist could note that the work signifies a life community of grasses and trees, of insects and birds, of rodents and reptiles whose fortunes where bound together in their "home" place. This makes the word more meaningful to youngsters as they can identify with the definition of home (Chapter 7, Freeman Tilden, Interpreting Our Heritage. The University of North Carolina Press, Chapel Hill, 1957.

Interpretation for children implies a fundamentally different approach. Yet some characteristics of young children are carried over into the later years. One of these is delight in the superlative; "the biggest egg" (ostrich) or "the littlest egg" (hummingbird). Another characteristic carrying over is the urge to know what it feels like, or the chance to smell or taste.

Children are not afraid to ask question as adults sometimes are. They are inquisitive and demand a well planned presentation geared to their interests.

The Written Word

The first step in preparing interpretive material is to ask the question "who is my audience and what is it I wish to say?" and "What is the keynote of this whole place?" Sometimes a quotation will be most effective. Humor, if used in the right spirit and in harmony with the area, can be successful (Chapter 8, Freeman Tilden, Interpreting Our Heritage. The University of North Carolina Press, Chapel Hill, 1957).

A sign in the Forest Preserve District of Cook County, Illinois:

I am an Old Time Country Lane
Now I have been officially
Vacated and Closed
(I never liked automobiles anyway)
I invite you to walk – as folks have walked for generations
And be friendly with my trees my flowers and my wild creatures

Interpretive signs and labels will most likely be read by standing people. People are not conditioned to read much while standing. Anything too long, in capital letters (except for headlines) may be ignored. Generally speaking a day use area should have more brevity of signage than an overnight area where people feel a greater sense of leisure.

Planning an Interpretation and Education Program

The profession of interpretation is characterized by its mission, ethics, standards, and practices. The profession offers enhanced opportunities for visitors to explore their own intellectual and emotional connections to the natural and cultural resources that comprise shared heritage. This is the mission or desired outcome of interpretation. The interpretation and education program of any organization that interprets heritage resources is in large measure conducted within the context established by the profession at large. In practice the profession is influenced by the majority worldview of any society in which it is conducted. A nation's constitution, along with the body of laws that flow from it, embody its collective ideals and philosophy, and the pragmatic application of them. The management plan outlines how the interpretation and education program fits into the larger park management picture. For a park's interpretation and education program, the program plan is often called the Comprehensive Interpretive Plan (CIP) (Interp Guide, U.S. Dept. of the Interior National Park Service).

Interpretation is conducted by interpreters, educators, rangers, visitor use assistants, volunteers, docents, and others that carry out the functions of a park's interpretation and education program.

Although the profession of interpretation values visitors' opinions, and values visitors coming to their own conclusions about what resources mean, interpretation must sometimes counter the behavior that stems from visitor opinions in order to protect resources from undue impairment. If a visitor wants to walk of trail despite signs that say "Please stay on trail," or if a visitor wants to climb on the ancient wall, or sit in that historic chair roped off in the corner, or pick the pretty flower, interpretation plays an important role in curbing such behavior. "Others should have the opportunity to enjoy that flower, too." Interpreters help visitors see that it is selfish for them to enjoy a resource in a way that reduces its integrity to a degree that denies that same opportunity to others.

Informational services are distinctly different from interpretive services, but are critical components of an interpreter's duties. It is commonly understood that when someone

refers to a park's interpretation and education program, such a reference includes both interpretive services and informational services.

Advocacy is distinctly different from interpretation. Unlike interpretation, the motive of advocacy is to bring about or cause a specific course of action to be taken, or conclusion to be arrived at by visitors. Advocacy seeks to sway the opinions of visitors. An interpreter turned advocate takes an unethical advantage of his or her position and aligns himself with one idea or policy over another and this should not be mistaken for professional interpretation.

Debating is distinctly different from interpretation. In forensic debate there are two sides. Each side attempts to prove the validity of their position while invalidating the position of the other side. Debaters craft communication strategies aimed at bolstering their own arguments and discrediting the arguments of the opposition. They craft messages tailored to this end. They make points. They use information that helps their case while consciously choosing to lead audiences away from information that may negatively impact their case.

Public relations work is distinctly different form interpretation. Public relations, public affairs, and public information are functions that are based on direction provided by a managerial hierarchy. The manager intends to establish goodwill among stakeholders of the site's resources. The manager intends the public to better understand why the organization conducts its mission as it does, the complexity of specific issues, and the steps being considered to address them. While both public relations and interpretation are efforts to inform the citizenry, providing information needed by the public to arrive at informed opinions about resource management. However, public relations work focuses on management's agenda rather than on unfettered explorations of resource-related ideas.

Instruction, teaching, and classroom education are distinctly different from interpretation. Providing instruction, and lecturing and teaching are all curriculum-bases endeavors that are designed to achieve the spirit and intent of the curriculum being taught. Although learning, including interpretation, has similar elements – such as the necessity to analyze, consider, and conclude, and using values in making judgments – interpretation is not based on presenting a curriculum that is designed to be learned. Instead, interpretation relies on the history of an individual visitor's experiences, in conjunction with their contemporary experiences with heritage resources to provoke visitors to consider a broad range of ideas and perspectives about the resources, and to arrive at their own conclusions about them.

A Framework for Thematic Interpretation

Interpretive services are thematic. They rely on the format of story to provide opportunities for people to explore their own intellectual and emotional connections to the natural and cultural resources that comprise shared heritage. Thematic

interpretation is a philosophy, framework, and process. Each element in the framework connects to the next: from Resource Importance, Overarching Stories, Specific Stories, Interpretive Service Design, and Interpretive Service Presentation. Each element leads to the final outcome of enhanced visitor enjoyment (Interp Guide, U.S. Dept. of the Interior National Park Service, p10).

An interpretive theme may be: the swamp is teaming with life. However, this theme isn't especially useful and does not provide adequate context to understand the idea the writer intends to explore. A more useful, revised version, follows: The swamp contains an unusually rich diversity of plants and animals interacting in one of nature's most vulnerable habitats, offering opportunities to consider the critical roles that water plays in the living systems upon which we all depend. This revised version provides a much clearer presentation of the author's thoughts.

Most interpreters develop an interpretive service via a structure noted below:

1. Comprehensive Interpretive Plan
2. Work is Assigned to an Interpreter
3. Interpreter Reviews Individual Service Plan
4. Interpreter Generates Idea and investigates Links
5. Interpreter Writes Subtheme
6. Interpreter Selects Methods
7. Interpreter Cohesively Organizes Links and Methods
8. Interpreter Conducts Research
9. Interpreter Refines and Finalizes Content
10. Interpreter Provides Service

The interpretive manager, other park staff, and stakeholders develop the park's Comprehensive Interpretive Plan (CIP). It directs the development of all interpretive and informational services by describing the park resources in story format using interpretive themes. Informational topics or orientation, visitor safety, resource preservation, and public relations are described. Audiences of the programs are described. Effective ways to facilitate audiences in exploration of themes and topics is described. Individual Service Plans (ISPs) describe operational details of interpretive or informational services.

The interpretive manager then assigns a front-line interpreter to perform a specific service.

The front-line interpreter reviews the Individual Service Plan for this service including the primary interpretive theme, audience, interpretive service type, service location, management's intent for providing this service, operational details, and record-keeping requirements for evaluation and reporting.

A core idea for the service is generated by the interpreter; links between tangible resources and intangible meanings are investigated as well as universal concepts that relate to the primary interpretive theme. A link is a designed connection between these tangible, intangible, and universal elements.

The interpreter writes a subtheme specifically for this service, and includes tangibles, intangibles, and universal concepts. **Methods are selected by the in order to encourage** opportunities for connections, guided by the subtheme. The interpreter then organizes the links and methods by the subtheme, creating the first viable service outline. Additional information is gathered by the interpreter. They consider multiple points of view, seek answers to questions, and verify knowledge by conducting research and consulting with park staff as needed. The interpreter revises, refines, and finalizes the service. The interpreter presents, publishes, posts, prints, or otherwise delivers the interpretive service or transmits it to others for design, layout, fabrication, and installation or distribution.

The framework culminates with interpretive opportunities that facilitate visitors exploring their own intellectual and emotional connections to the natural and cultural resources that comprise shared heritage.

A Framework for Informational Services

There are several types of informational services for which a park's interpretation and education program are usually responsible. Most interpreters develop an informational service within a progressive flow of ideas. Each element in the framework connects to the next (Interp Guide, U.S. Dept. of the Interior National Park Service, p19).

1. Park Resources
2. Resource Importance (statements of significance)
3. Management Decisions and Operational Issues, Topics, and Data
4. A. Orientation Information, B. Visitor Safety, C. Resource Preservation, and D. Public Relations
5. Service Content Idea
6. Informational Service Design
7. Informational Service Presentation

The relationship of park resources and resource importance are identical to the Interpretive Services section above.

Operational issues, topics, and data include the concerns and challenges and the communication of these ideas to the public.

Orientation information addresses information such as site location, hours of operation, fees, rules, trip-planning and more. This basic information can play an important role in visitor's enjoyment.

Visitor safety is focused on the visitors experiencing a safe visit. It may involve information on what to do during a lightning storm, how to stay hydrated during exercise, how to store food in the back country, signs warning against leaving valuables in plain view in a parked vehicle, park rules that may provide for a safe visit.

Resource preservation information is focused on preserving the integrity of resources while providing visitor access to them. Signs asking visitors to stay on the trails, or warning of fines for graffiti, or asking visitors to report sightings of specific animals are examples of this kind of information. Changing recreationists' undesired behavior and creating desired ones is addressed in Environmental Intervention Handbook for Resource Managers, (USDA Forest Service, prepared by Shawn M. Burn, Ph. D. California State Polytechnic University, San Luis Obispo In cooperation with Pacific Southwest Research Station, USDA Forest Service, PSW-96-0024). The first step described in this handbook is to describe the problem behavior and the desired behavior and to specify who, what, where and when the behavior occurs. The second step is to identify the barriers to the performance of the undesired behavior; often there are barriers to the performance of environmentally responsible behavior (ERBs). Barriers to ERBs include competing behaviors, competing attitudes and values that specify the contrary behavior, physical design that cause undesirable behaviors, or ignorance.

Public relations work is an inevitable part of any direct contact with the public. It includes providing information about the organization, its mission, management goals and actions. This information can support the growth of understanding among a constituency.

The service content idea is analogous to the subtheme in the interpretive services framework. It leads to the generation of the actual outline and substance of the specific service. The next step is for the informational service to be presented, delivered, or otherwise made available to visitors. Again, this framework culminates with informational opportunities that create an environment in which enjoyment and appreciation of heritage can be enhanced for the visitor.

The Visitor

Organizations that facilitate people making connections with heritage resources refer to the people they serve as audiences and/or visitors (Interp Guide, U.S. Dept. of the Interior National Park Service, p 25). The term audience tends to be used more often in conjunction with the performance of personal interpretive services, such as an interpretive talk while the term visitors tends to be a more inclusive term.

Audiences have discernable characteristics and these should be taken into account when designing and presenting the interpretive program (Interp Guide, U.S. Dept. of the Interior National Park Service, p 25). Factors to consider include the life experiences of

the individual visitor or group of visitors, levels of education, learning styles, languages, socioeconomic status, cultural traditions, time available for interaction and more.

INTERPRETIVE PLAN FOR THE GREAT TRINITY FOREST

Mission

The mission of the Great Trinity Forest Trail System is to offer safe, family oriented outdoor recreation opportunities along a system of trails. Trails offered will include hiking, bicycling, horseback riding and interpretive trails. The trails will offer residents of Dallas, visitors and students of nature a place to escape the pressures of an urban environment and get back in touch with nature. A series of trailheads will allow easy access to the trail system. Bulletin boards located at the trail head will offer safety tips, emergency contact information and interpretive information about the trails.

Purpose

The Interpretive Plan will be updated annually by managers with the assistance of volunteers. The purpose of the plan is to outline the products, projects and issues that the trail managers and volunteers identify as annual needs. At the end of the year this plan can serve as an accomplishment report, listing goals that were met, postponed or cancelled.

The objectives for the Great Trinity Forest are listed below:.

- To increase natural resource interpretive opportunities for visitors
- To enhance the image of the City of Dallas
- To present a positive image for the management activities at the Great Trinity Forest
- To develop a land stewardship ethic among visitors and users of the forest
- Develop field demonstration areas for visitors to see and understand ecosystem management practices

Annual Work Plan –Interpretive Program

- Create and distribute a quarterly newsletter about the Great Trinity Forest. Engage partners, users, volunteers, and the local community in naming the newsletter. Solicit material from partners to be included in the newsletter. Maintain a mailing list database and update information periodically. Make the newsletter available as a PDF file on the website and hard copy for mailing and for distribution at events.
- Coordinate with historical groups and archeologists and others to develop a brochure on the history of the Great Trinity River and forest.
- Develop interpretive themes for the spine trail and develop brochures for each trail system including hiking, bicycling and horseback riding. Some recommendations for interpretive themes are listed below.
- Develop Interpretive messages for each of the trail systems on the Great Trinity Forest
- Develop a website for the Great Trinity Forest with assistance from volunteer user groups

A theme focuses and directs interpretive efforts to reach the audience with a clear message that will interest and engage the visitor. The following are recommendations for interpretive themes for the Great Trinity Forest.

- The City of Dallas is taking a leadership role in land stewardship by engaging in ecosystem management of the Great Trinity Forest for wildlife and ecosystem management and resource conservation. It is recommended that the interpretive brochure contain the following information:
  - ✓ Ecosystem management involves managing for a diverse range of products and services including wildlife, clean air and water, quality recreation, and a diversity of tree species and understory plants.
  - ✓ Through ecosystem management the City of Dallas is improving the health and diversity of the Great Trinity Forest making it more productive for wildlife and for people; as a result a range of goods and services will be provided both now and in the future.
  - ✓ Ecosystems are complex, open, robust and dynamic systems nested one within the other. A rotting log may host an entire ecosystem as insects and fungi feed on the rotting material. The entire watershed within which rotting logs exist is also an ecosystem.
- The Great Trinity Forest is being managed to control non-native invasive species. It is recommended the interpretive brochure contain the following information:
  - ✓ What are non-native invasive plant species (NNIPS)? – They are species whose introduction does, or is likely to, cause economic or environmental harm to human health. Another name for NNIPS is noxious weeds.
  - ✓ Why are they a problem? – They are aggressive and difficult to eradicate.. They have an ability to invade natural ecosystems causing ecological, social and economic impacts. They degrade wildlife habitat, displace natives, contribute to the decline of threatened and endangered species, increase erosion, reduce recreational quality and enjoyment, and cost taxpayers money.
  - ✓ What can be done to prevent non-native invasive species? – Early detection is the key and pulling, mowing or use of herbicide to remove the NNIPS and rehabilitation and restoration of the area with native species.
- The Great Trinity Forest is helping to offset the loss of open space by offering lands to be managed for wildlife habitat and recreation close to the center of urban Dallas, Texas. It is recommended the interpretive brochure contain the following information:
  - ✓ Loss of open space is an urgent and important problem. It is important to balance growth and development with open space conservation. More than 34 billion acres were lost to development between 1982 and 2001.
  - ✓ Open space is vital to our well-being, our health and our economy. Open space provides: clean water, natural flood control, wildlife habitat, recreation and relaxation, timber and other forest products, and jobs.

- ✓ Forests provide a place where carbon is stored rather than released into the atmosphere adding to global warming.

Annual Work Plan – Volunteer Program

Develop a Great Trinity Forest Volunteer Handbook emphasizing recruiting tactics, a volunteer training program, a training program geared to volunteer coordinators or managers, and a process for volunteer recognition or awards. Develop a recording system for tracking volunteer hours and for getting feedback from volunteers entering and leaving the program.

Annual Work Plan - Community Outreach

Develop a local business sponsorship program and maintain an up-to-date list of sponsors and key contacts. Local businesses selling hiking, bicycle, and/or horse equipment or service would likely be interested in funding brochures, bulletin boards, or being mentioned or linked to the Great Trinity Forest website.

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Great Trinity Forest Management Plan

RECREATION

Economic Analysis of the Roosevelt Heights Campground

ECONOMIC ANALYSIS OF THE ROOSEVELT HEIGHTS CAMPGROUND IN THE GREAT TRINITY FOREST

The purpose of these economic analyses were to determine the payback period, based on certain cost and revenue assumptions, of constructing a campground in the Roosevelt Heights area within the Great Trinity Forest. The campground will contain 288 sites for recreational vehicles (RV), 60 sites for tents, and an area suitable for large groups to camp. All sites will have a table, fire ring and lantern post. The RV sites will each have electric and water hookups. Two alternative assumptions were made concerning sewage disposal: either (1) sewage hookups will be available at each RV site, or (2) dump stations will be available at the exit to the campground. Three shower/toilet buildings will be located within the campground. A welcoming center (fee entry station/headquarters) will be situated at the entrance/exit to the campground. The property will be fenced. Each RV site will measure 90' x 35'. Each tent site will measure 34' x 80'. All equipment, buildings, facilities and sites will be ADA approved.

Infrastructure Assumptions and Costs

- Planning, design and contract oversight ($3,900/RV site) $1,123,200

- Electric, including: PVC conduit, wire, excavation and backfill, panel board, RV panel, post, installation ($7,100/RV site) $2,044,800

- Road construction:
  - Blacktop, 10 feet wide and 4 inches thick ($220,000/mile)
    One-way roads: 37,140 feet $1,547,500
  - Blacktop, 20 feet wide and 4 inches thick ($ 440,000/mile)
    Two-way roads: 7,650 feet $ 637,500

- Sewer line ($100/foot)
  - Assuming sewer hookups at each RV site $1,335,000
  - Assuming dump stations at exit only $ 260,000

- Water line ($15/foot) $ 200,250

- Hookup Posts at RV sites
  - Water and Electric ($450/post) $ 129,600
  - Water, electric and sewage ($600/post) $ 172,800

- 353 Picnic tables, 12' long ($314 each) $ 110,842

- Fire ring and grills ($177 each) for 288 RV sites and 60 tent sites plus 5 large rings for group sites ($545 each) and 5 large fire rings ($189 each) $ 65,266

- 353 Lantern post ($66 each) $ 23,298

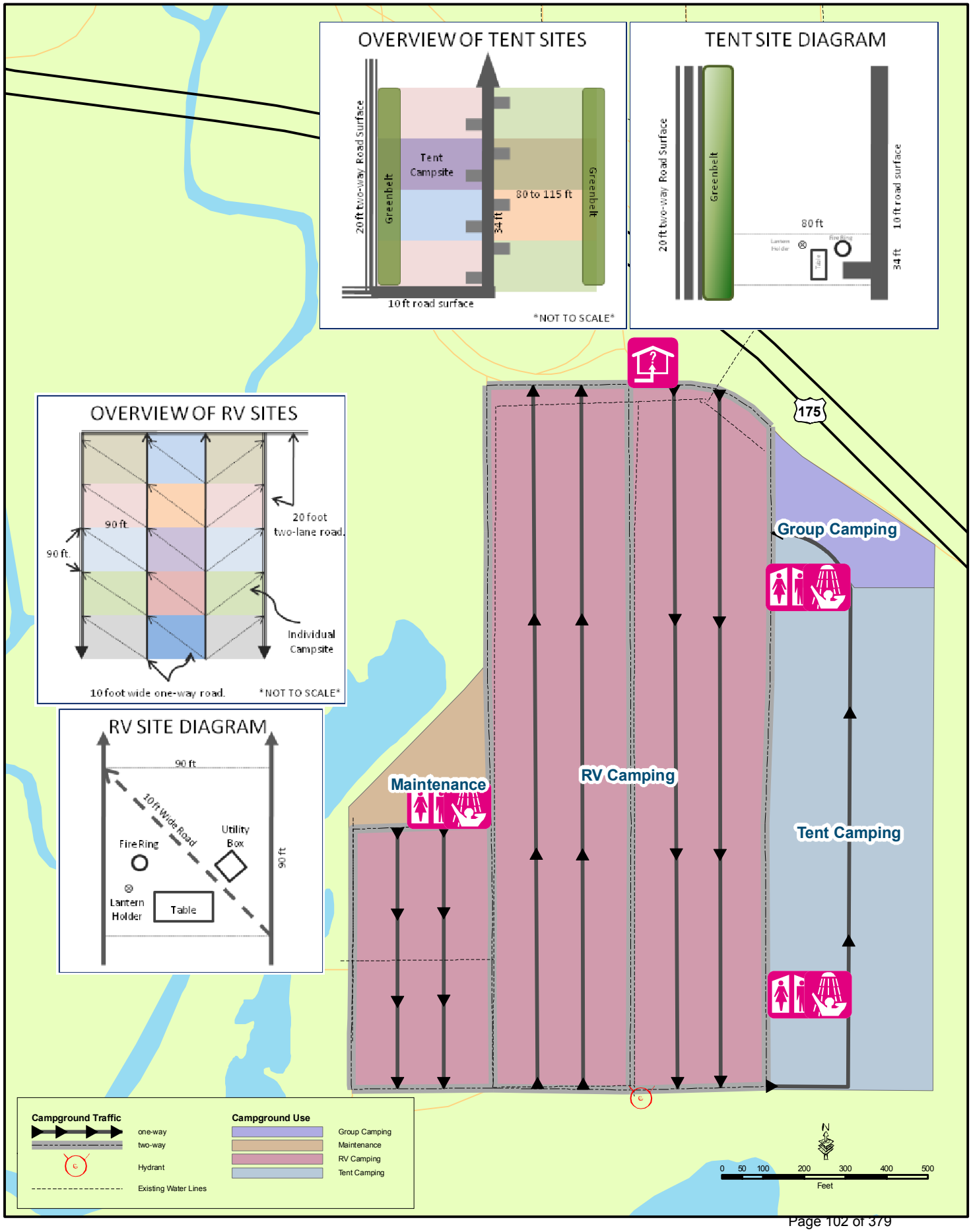
- 1 Fee entry station headquarters
  Prefabricated building includes water, electric and sewer hookups, slab, heat and air conditioning and window booth $ 50,000

- 3 Bathroom/Shower Prefabricated Buildings: 6 individual rooms within each building with shower, sink and toilet (2 rooms ADA); Facility includes: stainless steel plumbing and fixtures, electric fixtures, commercial hot water fixtures, shower fixtures, heat and air conditioning. (Building is 28' x 20' 8"; slab measures 40' x 32' 8" with a 6' sidewalk)

Building: $88,355 each	$265,065
Concrete slab (4" thick): $5,879 each	$ 17,637
Plumbing and electric hookup: $6,000 each	$ 18,000

- 6,000 feet of 8' tall chain link fence ($17.60/foot) $105,600

Great Trinity Forest - Roosevelt Heights Campground



RESULTS OF PAYBACK PERIOD CALCULATION

The payback period is the number of years it would take to pay for the cost of constructing the campground given the construction costs, the rate charged per night for an RV site and a tent site, and the expected occupancy rates (percentage of sites occupied). Employee costs are constant, not dependent on occupancy rates, and were not included in these calculations.

Total Construction Cost: **$7,716,758** (assuming sewage disposal at every RV site)

- Fee Charged per night: $50/RV site and $10/Tent site

	Occupancy Rates:				
	30%	50%	60%	70%	90%
Payback Period (Years)	4.70	2.82	2.35	2.01	1.57

- Fee Charged per night: $60/RV site and $10/Tent site

	Occupancy Rates:				
	30%	50%	60%	70%	90%
Payback Period (Years)	3.94	2.36	1.97	1.69	1.31

- Fee Charged per night: $70/RV site and $10/Tent site

	Occupancy Rates:				
	30%	50%	60%	70%	90%
Payback Period (Years)	3.39	2.04	1.70	1.45	1.13

Total Construction Cost: **$6,598,558** (assuming RV sewage disposal at campground exit only)

- Fee Charged per night: $50/RV site and $10/Tent site

	Occupancy Rates:				
	30%	50%	60%	70%	90%
Payback Period (Years)	4.02	2.41	2.01	1.72	1.34

- Fee Charged per night: $60/RV site and $10/Tent site

	Occupancy Rates:				
	30%	50%	60%	70%	90%
Payback Period (Years)	3.37	2.02	1.69	1.44	1.12

- Fee Charged per night: $70/RV site and $10/Tent site

	Occupancy Rates:				
	30%	50%	60%	70%	90%
Payback Period (Years)	2.90	1.74	1.45	1.24	.97

Great Trinity Forest Management Plan

RECREATION

Outdoor Recreation Accessibility Guidelines

THE GREAT TRINITY FOREST
Outdoor Recreation
Accessibility Guidelines

Executive Summary

The Great Trinity Forest Outdoor Recreation Accessibility Guidelines (ORAG) **provide guidance for maximizing accessibility of outdoor recreation areas in the Great Trinity River Forest (GTRF),** while protecting the unique characteristics of their natural setting.

These guidelines ensure the integration of all people, to the greatest extent possible, without separate or segregated access for people with disabilities.

The ORAG provide for one level of accessibility. They preserve the uniqueness of each area's setting through the use of conditions for departure and exceptions, where application of a technical provision would cause a change in an area's setting. Compliance with these guidelines will not always result in facilities that are accessible to all persons with disabilities. At some locations, the natural environment will prevent compliance with some of the guidelines technical provisions.

Purpose of the Great Trinity Forest Outdoor Recreation Accessibility Guidelines

The purpose of the ORAG is to provide guidance for maximizing accessibility, while protecting the unique characteristics of the natural setting. Specifically, the ORAG:

- Protect forest resources and the environment.
- Preserve the recreation experience.
- Provide for equality of recreation opportunities.
- Maximize accessibility.
- Are reasonable.
- Address public safety.
- Provide guidance.
- Are enforceable and measurable.
- Are based on independent use by persons with disabilities.
- Comply with the ABA, Section 504, and, to the greatest extent possible, current federal accessibility guidelines and standards.

Outdoor Recreation Accessibility Guidelines

OUTDOOR RECREATION ACCESSIBILITY GUIDELINES (ORAG)

Technical Provisions

1.0 APPLICABILITY

All camping facilities, picnic areas, trails, and other constructed features associated with outdoor recreation areas in the Great Trinity Forest (including benches; trash, recycling, and other essential containers; viewing areas at overlooks; mobility device storage; pit toilets; and outdoor rinsing showers) shall comply with the ORAG.

Deviations are permitted from certain technical provisions of the ORAG where one or more of four conditions for departure exist and an exception applies.

1. **Where compliance would cause substantial harm to cultural, historic, religious, or significant natural features or characteristics.**

A significant natural feature may include a large rock outcrop, tree, vegetation, or body of water that is regarded as distinctive or important. Significant natural features also could include areas protected under federal or state laws, such as areas with threatened or endangered species or wetlands that could be threatened or destroyed by full compliance with the technical provisions, or areas where compliance would directly or indirectly substantially harm natural habitat or vegetation.

Significant cultural features include areas such as archaeological sites, sacred lands, burial grounds and cemeteries, and protected tribal sites. Significant historical features include properties listed or eligible for listing in the National Register of Historic Places or other places of recognized historic value. Significant religious features include sacred tribal sites and other properties held sacred by an organized religion.

If the significant feature would be directly or indirectly altered, destroyed, or otherwise negatively impacted by construction of the outdoor recreation facility or element in the process of providing accessibility, this condition for departure would apply. Where designers or managers deviate from one of the technical provisions, the other technical provisions of the ORAG still apply.

When determining whether substantial harm would be incurred by the proposed change, consider only the specific additional impact of increasing the size, relocating the feature, or other change necessary to provide accessibility. This condition for departure does not apply where substantial impact will result from construction of non-accessible features and only a little more impact is due to construction directly related to accessibility.

For example, there may be concern about the number of trees of an uncommon species being removed to make way for an accessible camping unit. This condition for departure would not apply if 15 trees must be removed to make way for a non-accessible camping unit and only 3 more trees must be removed to provide an accessible camping unit. The majority of the proposed damage to the grove is not attributable to compliance with accessibility requirements. In this case, an alternate location should be selected for the camping unit.

2. Where compliance would substantially change the nature of the setting or the purpose or a portion of a facility or would not **be consistent with the applicable land management plan.**

Outdoor recreation areas such as picnic areas and campgrounds are designed for a certain purpose. In some areas, complying with the technical provisions in the ORAG could change the nature of some recreation opportunities. Further, compliance could negatively impact the unique characteristics of the natural setting that prompt people to recreate in the outdoor environment. People using trails, for example, often experience the outdoor environment in a more natural state, with limited or no development. Use of manufactured building materials or engineered construction techniques in such a setting can change its primitive character and therefore the user's experience. In these settings, people generally are looking for a higher degree of challenge and risk where they can use their outdoor or survival skills. Compliance with the technical provisions of the ORAG, particularly those related to surface and obstacles, could destroy the natural or undeveloped nature of the setting. This condition for departure addresses these concerns.

3. Where compliance would require construction methods or materials that are prohibited by federal, state, or local **law.**

For example, use of mechanized equipment is prohibited in wilderness areas. Construction methods are limited to hand tools in those areas. Imported materials may be prohibited to maintain the integrity of the natural setting. Construction methods and materials employed in wetlands are strictly limited. For traditional, historic, or other reasons, some trails are built using only the native soil for surfacing, which may not be firm and stable. Federal statutes such as the Wilderness Act and the Endangered Species Act and state and local laws often impose restrictions to address environmental concerns. Many aquatic features are protected under federal or state laws. Some constructed water crossings that are required to provide accessibility may not be permitted under certain laws or regulations.

4. Where compliance would be impractical due to terrain or prevailing construction practices**.**

For example, when altering an trail, compliance with the ORAG's technical provisions, particularly those pertaining to running slope in areas of steep terrain, may require extensive cuts or fills that would be difficult to construct and maintain or that could cause drainage and erosion problems. Certain soils are highly susceptible to erosion. Other soils expand and contract in accordance with their water content. If compliance with the ORAG requires techniques that are incompatible with the natural drainage or existing soil, the trail will be difficult, if not impossible, to maintain. This condition for departure also may apply where construction methods for particularly difficult terrain or an obstacle require the use of equipment that is not typically used in that setting. One example is where a bulldozer is required to remove a flood debris, but access to that area by large equipment may not be possible without destroying the surrounding environment.

If prevailing construction practices do not involve importation of surfacing material and the natural surfacing material cannot be made firm and stable, it may be impossible to comply with the technical provision requiring a firm and stable surface.

The phrase "would be impractical" in this condition for departure refers to what is not reasonable, rather than to what is technically infeasible. This condition for departure applies when the effort and resources required to comply would be disproportionately high relative to the level of access established. Although compliance is technically feasible, the amount of effort and resources required is not reasonable.

This condition for departure is not intended to exempt an outdoor recreation area from the technical provisions of the ORAG simply because of a particular construction practice (*e.g.*, the use of hand tools) or to encourage the use of a certain construction practice to avoid compliance when more expedient methods and resources are available.

Regardless of the amount of money that is available to the city, consistent with the principles of the ORAG, the natural setting should not be changed to make a camping unit, trail, or other outdoor recreation area accessible. Thus, there is no requirement to use drastic measures to provide accessibility if doing so would unacceptably change the character of the setting and the recreation opportunity.

While the ORAG addresses the special circumstances where designers and managers may not be able to achieve accessibility, they are always encouraged to provide access to the greatest extent possible.

1.2 Definitions

Access Route (AR). A continuous, unobstructed path designed for pedestrian use that connects constructed features in a picnic area or campground, at a trailhead or other recreation site where modifications are provided for visitor convenience and comfort.

Camping Unit. A discrete area within a campground that is used for camping and that includes a camp living area and a parking spur.

- **Camp Living Area.** The area in a camping unit that contains constructed features (such as picnic tables, grills, fire rings, utilities, and other related elements) and that is located adjacent to or near a parking spur.

- **Parking Spur.** The space in a camping unit that is designed for vehicular access and parking and that includes a driveway and vehicle parking area**.**

    - **Driveway.** The section of a parking spur connecting the road accessing a campground and a vehicle parking area.

    - **Vehicle Parking Area.** The section of a parking spur where camping-vehicles (such as cars, vans, recreational vehicles, and trailers) are parked.

Clear Floor or Ground Space. The minimum unobstructed floor or ground space required to accommodate a single, stationary wheelchair and occupant.

Constructed Feature. A picnic table; a fire ring; a pedestal grill; a tent pad; a bench; a trash, recycling, or other essential container; a viewing area at an overlook; a pit toilet; an outdoor rinsing shower; or other constructed element associated with an outdoor recreation area.

Essential Container. A trash, recycling, food storage, or other animal-resistant container.

Picnic Unit. A place in a picnic area that contains one or more constructed features (such as picnic tables, grills, and other related elements).

Protruding Object. An object, such as a tree or branch, that extends into the clear width of an trail from beside or above it.

Recreation Site. A discrete area on the GTRF that provides recreation opportunities, receives use, and requires a management investment to operate and/or maintain to standard.

Slope

- Cross Slope. **The percentage of rise to length when measuring the AR from edge to edge perpendicular to the direction of travel.**

- Running Slope. **The percentage of rise to length when measuring the AR parallel to the direction of travel.**

Surface

- Firm. **N**ot noticeably distorted or compressed by the passage of a device that simulates a person using a wheelchair. Surface firmness should be determined and documented during the planning process for the primary seasons in which the surface will be used, under normally occurring weather conditions.

- Stable. Not permanently affected by normally occurring weather conditions and able to sustain normal wear and tear of the uses of the area between planned maintenance cycles.

Technical Provision. Specification of the dimensions and characteristics of constructed features that are required to ensure accessibility.

Trail. For purposes of the ORAG, a trail is a route that is designed, constructed, or designated for recreational pedestrian use. A trail is not an access route (AR).

Trailhead. For purposes of the ORAG, a trailhead is a site designed and developed by the city, a trail association, a trail maintaining club, a trail partner, or other cooperators to provide staging for trail use.

For purposes of the ORAG, the following do not constitute a trailhead:

- Junctions between trails where there is no other access.

- Intersections where a trail crosses a road or users have developed an access point, but no improvements have been provided by the city, a trail association, a trail maintaining club, a trail partner, or other cooperators beyond minimal signage for public safety

Wheelchair. A device, including one that is battery-powered, that is designed solely for use by a mobility-impaired person for locomotion and that is suitable for use in an indoor pedestrian area. A person whose disability requires use of a wheelchair or mobility device may use a wheelchair or mobility device that meets this definition anywhere foot travel is permitted.

2.0 ACCESS ROUTES (ARs)

Access Routes and Trails in the Great Trinity River Forest

Access Routes and Trails are not required to be constructed in areas of the GTRF if the resulting construction would substantially alter the nature of the setting. While some constructed features (such as picnic tables and fire rings) may be provided in GTRF, these features may be provided for resource protection rather than visitor comfort and convenience.

Constructed features in the GTRF should be designed appropriately for the setting and should comply with the ORAG to ensure that the facility can be used by a person with a disability. In the GTRF, site modification for constructed features, if it occurs at all, generally should be limited to the minimum necessary for installation of the constructed features.

2.1 General. ARs are not required in forest. In the Great Trinity River Forest, a path connecting associated constructed features and a path connecting them to a trail are not ARs and are not required to meet the technical provisions for an AR in the ORAG.

2.2 Slope. **The** slope of ARs shall comply with sections 2.2.1 and 2.2.2.

2.2.1 Running Slope. The running slope of ARs shall comply with all applicable provisions of this section. No more than 15% of the total length of an AR may exceed a slope of 1:12 (8.33%).

2.2.1.1. The running slope of an AR shall be 1:20 (5%) or less for any distance.

2.2.1.2. A running slope of up to 1:12 (8.33%) is permitted for up to 50 feet (15250 mm) of an AR. Resting intervals complying with section 2.3 shall be provided at distances of no more than 50 feet apart.

2.2.1.3. A running slope of up to 1:10 (10%) is permitted for up to 30 feet of an AR. Resting intervals complying with section 2.3 shall be provided at distances of no more than 30 feet apart.

2.2.2 Cross Slope. The cross slope of an AR shall be no more than 1:33 (3%).

2.3 Resting Intervals. Resting intervals shall be at least 60 inches in length, shall have a width at least as wide as the widest portion of the AR leading to the resting intervals, and shall have a slope of no more than 1:33 (3%) in any direction.

2.4 Surface.

The accessible surface of trails and the surface surrounding constructed features must be firm and stable. The ORAG does not require a slip resistance surface because slip resistance cannot be guaranteed in the outdoor environment. Weather conditions (rain and ice) will affect slip resistance. For example, natural or non-hardened surfaces may not be slip resistant. Slip resistance also may be difficult to control when leaves and other surface debris caused by flooding accumulate on a surface.

The means and materials used to establish accessible exterior surfaces are plentiful. Crushed stone, fines, packed soil, and other natural materials can provide a firm and stable surface. Natural materials bonded with synthetic materials can provide the required degree of stability and firmness. However, not all of these materials are suitable for every outdoor recreation area. An exception permits deviating from this provision where one or more conditions for departure in section 1.1 exist. For example, as stated in the fourth condition for departure, if the prevailing construction practices do not involve importation of surfacing material and the natural surfacing material cannot be made firm and stable, compliance with the firm and stable requirement may not be possible.

The terms “firm” and “stable” have never been clearly defined, nor has there been a readily available means of technical measurement to determine what constitutes a firm and a stable surface. In the ORAG, a firm surface is not

noticeably distorted or compressed by the passage of a device that simulates a person using a wheelchair. In the ORAG, a stable surface is not permanently affected by normally occurring weather conditions and is able to sustain normal wear and tear of the uses of the site between planned maintenance cycles. Surface firmness and stability should be determined and documented during the planning process for the primary seasons in which the surface will be used, under normally occurring weather conditions.

The purpose of ensuring the firmness and stability of a surface is to prevent mobility devices from sinking into the surface, thereby making it difficult for a person using crutches, a cane, a wheelchair, or other mobility device to move through the area with reasonable effort. The standard mobility device used in these accessibility guidelines is the wheelchair because its dimensions and multiple contacts points (two wheels and two casters) often make it difficult to accommodate. Thus, if a person using a wheelchair can utilize an area, most other people can also utilize that area. To determine the wheelchair compatibility of a surface, that is, whether it is firm and stable enough to accommodate a person using a wheelchair, one should look at the surface and consider whether (1) a person riding a narrow-tired bicycle could cross the surface easily without the wheels sinking into or disturbing the surface; and (2) a heavy child in a folding umbrella stroller with small plastic wheels could be pushed across that surface without the small wheels sinking into or distorting the surface. The wheel configurations on these two devices are similar to the large rear tires and small front casters of the average wheelchair. While this method for determining firmness and stability is not scientifically accurate, it has proven to be effective.

2.5 Clear Tread Width. The clear tread width of an AR shall be at least 36 inches (915 mm).

> Exception. The clear tread width of an AR shall be at least 32 inches for a maximum distance of 24 inches where one or more conditions for departure in section 1.1 exist.

2.6 Passing Spaces. Where the clear tread width of an AR is less than 60 inches, passing spaces shall be provided at intervals of up to 200 feet. Passing spaces shall be either at least 60 inches by 60 inches or an intersection of two walking surfaces that provide a T-shaped space complying with 304.3.2 of the ABAAS, provided that the arms and stem of the T-shaped space extend at least 48 inches beyond the intersection. The cross slope of passing spaces shall not exceed 1:33 (3%) in any direction.

Exception. Passing spaces shall be provided at intervals of up to 300 feet where one or more conditions for departure in section 1.1 exist.

2.7 Tread Obstacles. Where tread obstacles exist along an AR, they shall not exceed 1 inch in height.

Exception. Tread obstacles of up to 2 inches high are permitted where beveled, with a slope no greater than 1:2, where one or more conditions for departure in section 1.1 exist.

2.8 Protruding Objects. Protruding objects along ARs shall comply with 307 of the ABAAS

Protruding objects can not extend into the clear width of an accessible trails from beside or above it. Leaning tree trunks and branches are common protruding objects. Accessible trails provide at least 80 inches of headroom. Where the vertical clearance of an accessible trail is reduced to less than 80 inches because one or more conditions for departure in section 1.1 exist, a barrier to warn blind and visually impaired persons must be provided. This exception allows an accessible trails to pass under branches or through other naturally constricted areas without changing the character of the setting or the recreation experience.

Exception. Where vertical clearance of an AR is reduced to less than 80 inches because one or more conditions for departure in section 1.1 exist, a barrier shall be provided to warn individuals who are blind or visually impaired.

2.9 Openings. Openings in the surface of ARs shall be small enough to prevent passage of a 1/2-inch diameter sphere. Elongated openings shall be placed so that the long dimension is perpendicular or diagonal to the dominant direction of travel.

Exception. Openings are permitted to run parallel to the dominant direction of travel, as long as the opening does not permit passage of a 1/4-inch diameter sphere.

2.10 Edge Protection. Where edge protection is provided along an AR, it shall be at least 3 inches in height.

3.0 SWIMMING AREAS**. No swimming areas will be constructed in the GTRF.**

4.0 CONSTRUCTED FEATURES IN PICNIC AREAS

All picnic tables, pedestal grills, and other picnic area elements that are purchased or constructed by the city must be accessible, with few exceptions.

4.1 PICNIC UNITS

4.2 PICNIC TABLES

4.2.1 General

Where picnic tables are provided, each shall comply with section 4.2. At least 20% of the total number of tables provided at a recreation site, shall be connected to an AR complying with section 2.0. Connection to an AR is not required for picnic tables provided in the GTRF.

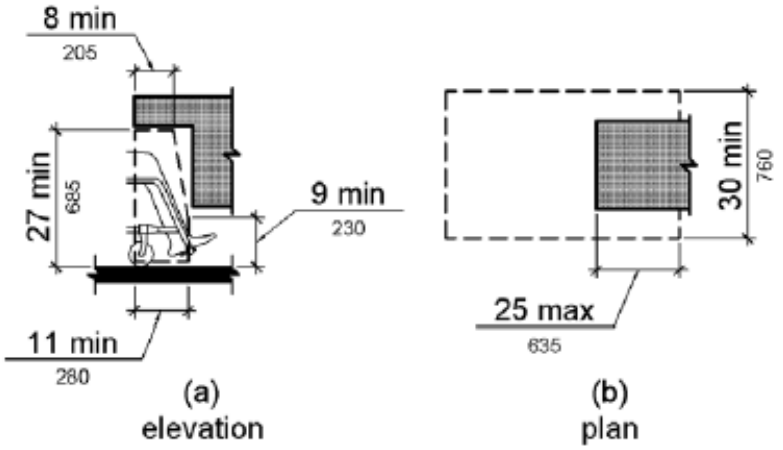
4.2.2 Number of Wheelchair Seating Spaces. A picnic table shall have at least one wheelchair seating space. The total number of wheelchair seating spaces required shall be determined in accordance with figure 4.2.2. Each wheelchair seating space shall comply with section 4.2.3.

Figure 4.2.2

Table Top Perimeter	**Typical Table Length (with a width of 2 ft., 6 in.)**	**Number of Wheelchair Seating Spaces Required**
Less than 25 linear ft.	Up to a 9-ft. table	1 spaces

25 to 44 linear ft.	10-, 12-, 16- or 18-ft. table	2 spaces
45 to 64 linear ft.	Typically custom-built table	3 spaces
65 to 84 linear ft.	Typically custom-built table	4 spaces
85 to 104 linear ft.	Typically custom-built table	5 spaces

4.2.3 Wheelchair Seating Space**.** Knee space for wheelchair seating shall be at least 27 inches (685 mm) high, 30 inches (760 mm) wide, and 19 inches (485 mm) deep. Toe clearance of at least 9 inches (230 mm) in height shall extend at least an additional 5 inches (125 mm) from the knee clearance. Clear floor or ground space that is at least 30 inches by 48 inches shall be provided at each seating space that is required to be accessible.



ABAAS Figure 306.3 Knee and Toe Clearance

4.2.4 Clear Floor or Ground Space. At least 48 inches (1220 mm) of clear floor or ground space surrounding the usable portion of a picnic table, measured from the seat, shall be provided. This space shall not overlap the AR.

Exception. The clear floor or ground space for a picnic table may be reduced to no less than 36 inches (915 mm) where one or more conditions for departure in section 1.1 exist.

4.2.5 Slope. The slope of the clear floor or ground space required by sections 4.2.3 and 4.2.4 shall not exceed 1:50 (2%) in any direction.

> **Exception.** Where surface conditions require a slope greater than 1:50 (2%) for proper drainage, a slope of no more than 1:33 (3%) is permitted.
>
> Exception. **Section 4.2.5** does not apply where one or more conditions for departure in section 1.1 exist.

4.2.6 Surface. The surface of the clear floor or ground space required by sections 4.2.3 and 4.2.4 shall be firm and stable. The type of surface should be appropriate to the setting and level of development.

> Exception. **Section 4.2.6** does not apply where one or more conditions for departure in section 1.1 exist.

4.3 COOKING SURFACES, GRILLS, AND PEDESTAL GRILLS

4.3.1 General. Where cooking surfaces, grills, or pedestal grills are provided, each cooking surface, grill, or pedestal grill shall comply with section 4.3. At least 20% of the total number of cooking surfaces, grills, or pedestal grills provided at a recreation sites, shall be connected to an AR complying with section 2.0. Connection to an AR is not required for cooking surfaces, grills, or pedestal grills provided in GTRF.

4.3.2 Cooking Surface Height. The cooking surface shall be at least 15 inches (380 mm) and no more than 34 inches (865 mm) above the ground or floor surface.

> **Exception.** Section 4.3.2 does not apply to the height of cooking surfaces attached to fire rings.

4.3.3 Controls. Controls and operating mechanisms shall comply with 308 and 309.4 of the ABAAS.

4.3.4 Clear Floor or Ground Space. All usable portions of the cooking surface shall be provided with a clear floor or ground space that is at least 48 inches (1220 mm) in depth measured from the cooking surface and at least 48 inches (1220 mm) in width. This space shall not overlap the AR.

> Exception. The minimum depth may be reduced to no less than 36 inches (915 mm) where one or more conditions for departure in section 1.1 exist.

4.3.5 Slope**.** The slope of the clear floor or ground space required by section 4.3.4 shall not exceed 1:50 (2%) in any direction.

> **Exception.** Where surface conditions require a slope greater than 1:50 (2%) for proper drainage, a slope of no more than 1:33 (3%) is permitted.
>
> Exception. **Section 4.3.5** does not apply where one or more conditions for departure in section 1.1 exist.

4.3.6 Surface. The surface of the clear floor or ground space required by section 4.3.4 shall be firm and stable. The type of surface should be appropriate to the setting and level of development.

> Exception. **Section 4.3.6** does not apply where one or more conditions for departure in section 1.1 exist.

5.0 CONSTRUCTED FEATURES IN CAMPGROUNDS

All the elements of the camping unit must comply with the ORAG. Individuals can then select the location where they want to camp without being limited by the location of accessible constructed features, such as picnic tables and fire rings.

5.1 CAMPING UNITS AND PARKING

5.1.1 General**.** Where camping units are provided in a campground, section 5.0 shall apply to each camping unit. Camp living areas shall comply with sections 5.1.1, 5.1.2, and 5.1.3. Parking spurs shall comply with sections 5.1.1, 5.1.4, and 5.1.5.

5.1.2 Surface. The ground surface in all camp living areas shall be firm and stable. The type of surface should be appropriate to the setting and level of development.

5.1.3 Camp Living Areas. All constructed features provided in a camp living area shall comply with applicable provisions in sections 4, 5, and 6.

5.1.3.1 Walk-In Camping. Where walk-in camping is provided, an AR connecting the camp living area to the parking spur shall be provided in accordance with section 2.0.

5.1.4 Vehicle Parking Areas Parking Spurs ─ General. Where a parking spur is adjacent or attached to a camp living area, the parking spur shall comply with sections 5.1.1, 5.1.4, 5.1.5, and 5.1.6.

Accessible vehicle parking areas parking spurs for recreational vehicles and trailers shall be provided in accordance with figure 5.1.

Figure 5.1

Number of Camping Units	Minimum Number of Accessible Vehicle Parking Areas of Parking Spurs for Recreational Vehicles and Trailers
1	1
2 to 25	2
26 to 50	3
51 to 75	4
76 to 100	5
101 to 150	7

5.1.5 Parking Spurs. Parking spurs shall comply with applicable provisions of section 5.1.5.

5.1.5.1 Slope of Parking Spurs. The slope of parking spurs shall comply with applicable provisions of section 5.1.5.1.

5.1.5.1.1 Vehicle Parking Areas. The slope of vehicle parking areas shall not exceed 1:50 (2%) in any direction.

Exception. Where surface conditions require a slope greater than 1:50 (2%) for proper drainage, a slope of no more than 1:33 (3%) in any direction is permitted.

5.1.5.1.2 Running Slope of Driveways. The running slope of driveways shall be no more than 1:12 (8.33%) for no more than 50 feet (15250 mm).

Exception **1.** A running slope of up to 1:10 (10%) for driveways is permitted for up to 30 feet (9150 mm).

Exception 2. For alteration only, not new construction, if exception 1 of section 5.1.5.1.2 cannot be met because one or more conditions for departure in section 1.1 exist, a running slope of no more than 1:10 (10%) is permitted for no more than 50 feet (15250 mm).

5.1.5.1.3 Cross Slope of Driveways. The cross slope of driveways shall not exceed 1:33 (3%).

Exception**.** The cross slope of driveways may be no more than 1:20 (5%) where needed to ensure proper drainage or to transition from the running slope of a campground road.

5.1.5.2 Width of Vehicle Parking Areas. The width of vehicle parking areas shall comply with applicable provisions of section 5.1.5.2.

5.1.5.2.1 Vehicle Parking Areas of Parking Spurs . The width of vehicle parking areas shall be at least 16 feet (4880 mm).

Exception 1. Where the width of a vehicle parking area cannot be at least 16 feet (4880 mm) because one or more conditions for departure in section 1.1 exist, the width of the parking vehicle area shall be at least 13 feet (4880 mm).

Exception 2. Where the width of a vehicle parking area cannot be at least 13 feet (4880 mm) because one or more conditions for departure in section 1.1 exist, section 5.1.5.2.1 does not apply.

5.1.5.2.2 Vehicle Parking Areas of RV Parking Spurs. Vehicle parking areas in parking spurs that are required to be accessible under section 5.1.4 (Fig.5.1) for recreational vehicles and trailers shall be at least 20 feet (6100 mm) wide. The 20-foot width requirement does not apply to the driveway of a parking spur.

Exception. **Where a double camping unit is provided to accommodate two recreational vehicles or trailers side-by-side in a vehicle parking area in an accessible parking spur,** the total width of

the vehicle parking area may be reduced from 40 feet (12,200 mm) to 36 feet (10980 mm).

5.1.6 Identification of Accessible Camping Units

If not all camping units at a campground are accessible and the camping units are not assigned upon arrival or through a reservation system, the accessible camping units must be identified at an entrance station. The accessible camping units should be assigned as needed to individuals with disabilities. Accessible camping units should be assigned to persons without disabilities only after non-accessible camping units are no longer available, thereby maximizing the availability of accessible camping units for persons with disabilities. The following type of statement is appropriate on the registration information sign: "Sites 2, 4, 6, and 10 are accessible. If no one in your group needs accessible facilities, please do not use these sites unless all other sites are filled."

Individual camping units should not be signed as accessible. Numerous complaints may be received from members of the public concerning this type of signage. Individuals with disabilities have stated that it tends to stigmatize them and make them more vulnerable to crime. Individuals who do not have disabilities are uncomfortable using a camping unit that is designated for people with disabilities because they believe it may be illegal, like parking in an accessible parking space in a parking lot.

5.2 Tent Pads and Tent Platforms

The dimensions of tent pads and tent platforms are not specified because the type of tent most commonly used at campgrounds varies widely. For example, at a campground located close to a wilderness area, small tents may be commonly used, whereas at another campground with numerous amenities for children, large, multi-room family tents may be used more often. Local campground managers are the best source of information concerning the tent size most commonly used in an area.

It is not unusual to a 5-foot-by-8-foot tent. Typically, the spaces allotted for these tents are approximately 10 feet by 12 feet. The size of an accessible tent pad would need to be increased to at least 13 feet by 16 feet to accommodate a 5-foot-by-8-foot tent. If all tent spaces were required to meet the ORAG's technical provisions, a significant amount of additional excavation would be necessary. At least 20% at recreation sites should be built to meet ORAG.

5.2.1 General. At least 20% of the tent pads and tent platforms provided at a recreation site shall be connected to an AR complying with section 2.0.

5.2.1.1. At least 5% of the tent pads and tent platforms provided in a GFA shall comply with section 5.2. Connection to an AR is not required.

5.2.2 Clear Floor or Ground Space. Tent pads and tent platforms shall have clear floor or ground space surrounding the tent that is at least 48 inches (1220 mm) wide. This space shall not overlap the AR.

> Exception. The clear floor or ground space for tent pads and tent platforms may be reduced to no less than 36 inches (915 mm) where one or more conditions for departure in section 1.1 exist.

5.2.3 Slope. The slope of tent pads and tent platforms shall not exceed 1:50 (2%) in any direction.

> **Exception.** Where surface conditions require a slope greater than 1:50 (2%) for proper drainage, a slope of no more than 1:33 (3%) for tent pads and tent platforms is permitted.

5.2.4 Tent Pad Surface. Tent pads shall have a surface that is firm and stable and designed to allow use of tent stakes and other securing devices.

> Exception. **Section 5.2.4** does not apply where one or more conditions for departure in section 1.1 exist.

5.2.5 Tent Platform Surface. The surface of tent platforms shall be firm and stable. The type of surface should be appropriate to the setting and level of development.

5.2.6 Edge Protection. Where provided, edge protection for tent platforms shall be at least 3 inches (75 mm) high.

5.2.7 Connection. The surface of tent platforms shall be accessible by a ramp or transfer or directly from adjacent ground surface.

5.3 FIRE RINGS

5.3 Fire Rings. When one or more conditions for departure in section 1.1 exist, there is an exception to the requirement that the fire-building surface be at least 9 inches above the ground or floor.

5.3.1 General. Where fire rings are provided, each shall comply with section 5.3. Each fire ring provided at a recreation site shall be connected to an AR complying with section 2.0. Connection to an AR is not required for fire rings provided in The GTRF.

5.3.2 Height of Fire-Building Surface. The fire-building surface within a fire ring shall be at least 9 inches (230 mm) above the ground or floor.

> Exception. **Section 5.3.2** does not apply in the GTRF where one or more conditions for departure in section 1.1 exist.

5.3.3 **Raised Edge** This provision limits the combined distance over a raised edge or curb down to the fire-building surface to 24 inches. This provision does not apply to the standard, commercially manufactured fire ring, such as those available from Pilot Rock and Iron Mt. Forge that tend to be used in most campgrounds. The material used to fabricate these fire rings is usually some type of metal that is not very thick or wide. The only requirement for this type of standard fire ring is that the fire-building surface be located at least 9 inches above the ground.

The raised edge provision in this section is intended primarily for a custom-built unit that would have a little wall around the fire-building area, perhaps built out of bricks or mortared stone. The distance over this edge down to the fire-building surface cannot exceed 24 inches under this technical provision. The measurement in this technical provision has nothing to do with the measurement from the top of the unit down to the ground, because someone in a wheelchair is not reaching down to the ground.

5.3.4 Clear Floor or Ground Space. All usable portions of a fire ring shall have clear floor or ground space extending at least 48 inches (1220 mm) deep from the fire ring and at least 48 inches (1220 mm) wide. This space shall not overlap the AR.

Exception. The minimum clear floor or ground space for fire rings may be reduced to no less than 36 inches (915 mm) where one or more conditions for departure in section 1.1 exist.

5.3.5 Slope. **The slope of the clear floor or ground** space for fire rings shall not exceed 1:50 (2%) in any direction.

Exception. Where surface conditions require a slope greater than 1:50 (2%) for proper drainage, a slope of no more than 1:33 (3%) for the clear floor or ground space for fire rings is permitted.

Exception. Section 5.3.5 does not apply where one or more conditions for departure in section 1.1 exist.

5.3.6 Surface. The surface of the clear floor or ground space for fire rings shall be firm and stable. The type of surface should be appropriate to the setting and level of development.

Exception. Section 5.3.6 does not apply where one or more conditions for departure in section 1.1 exist.

UTILITIES

5.4.1 General. Electric, water, sewage, and other types of utilities shall comply with section 5.5.

5.4.2 Controls and Operating Mechanisms. Controls and operating mechanisms for utilities **must comply with the technical provisions in the Architectural Barriers Act of 1968 (**ABAAS) for **clear floor or ground space (305); reach ranges (308); and operating controls (309). Section 309 of the ABAAS requires controls to be operable with one hand, without pinching, grasping, or twisting the wrist, with no more than 5 pounds of pressure. If a control mechanism can be operated with one closed fist, with no more than 5 pounds of pressure, it should be in compliance.**

> **Exception.** 308 and 309.4 of the ABAAS do not apply to sewage hookups or to handpumps, if there is no readily available model to meet the specifications of the well.

5.4.3 Clear Floor or Ground Space. Clear floor or ground space that complies with 305.3 of the ABAAS and is positioned for a forward or parallel approach shall be provided around all usable sides of utilities. The clear floor or ground space for utilities may overlap adjacent clear floor or ground spaces.

5.4.4 Fixed Water Spouts. Fixed water spouts shall be located at least 28 inches (710 mm) and no more than 36 inches (915 mm) above the ground or floor and shall be on the perimeter of at least 60 inches (1525 mm) by 60 inches (1525 mm) of clear floor or ground space.

5.4.5 Slope. The slope of the clear floor or ground space required by sections 5.5.3 and 5.5.4 shall not exceed 1:50 (2%) in any direction.

> **Exception.** Where surface conditions require a slope greater than 1:50 (2%) for proper drainage, a slope of no more than 1:33 (3%) for the clear floor or ground space required by sections 5.5.3 and 5.5.4 is permitted.

5.4.6 Surface. The surface of the clear floor or ground space required by sections 5.5.3 and 5.5.4 shall be firm and stable. The type of surface should be appropriate to the setting and level of development.

5.5 UTILITY SINKS

5.5.1 General. **Where util**ity sinks are provided, at least 5%, and at least one of each type of sink provided in each accessible room or space, shall comply with section 5.6 and shall be connected to an AR complying with section 2.0.

5.5.2 Clear Floor or Ground Space. Clear floor or ground space for utility sinks that complies with 305.3 of the ABAAS for a forward or parallel approach shall be provided. This space shall not overlap the AR.

5.5.3 Slope. The slope of the clear floor or ground space for utility sinks shall not exceed 1:50 (2%) in any direction.

> **Exception.** Where surface conditions require a slope greater than 1:50 (2%) for proper drainage, a slope of no more than 1:33 (3%) for the clear floor or ground space for utility sinks is permitted.

5.5.4 Surface. The surface of the clear floor or ground space for utility sinks shall be firm and stable. The type of surface should be appropriate to the setting and level of development.

5.5.5 Height. The counter or rim shall be no more than 34 inches (865 mm) above the ground or floor.

5.5.6 Depth. The bottom of the bowl shall be at least 15 inches (380 mm) above the ground or floor.

5.5.7 Controls. Controls and operating mechanisms shall comply with 308 and 309.4 of the ABAAS.

6.0 OTHER CONSTRUCTED FEATURES

6.1 BENCHES

6.1.1 General. **Where benches are provided, each shall comply with section 6.1. At least 20% of the benches provided at a recreation site shall be connected to an AR complying with section 2.0. Connection to an AR is not required for benches provided in a GFA.**

> Exception. **Section 6.1.1 does not apply to built-in benches provided in assembly areas. These benches are covered by F221.2.1.1, F221.2.2, and 903 of** the ABAAS**.**

6.1.2 Height. **The front edge of the seat of a bench shall be at least 17 inches (430 mm) and no more than 19 inches (485 mm) above the ground or floor.**

6.1.3 Backrest and Armrest. The ABAAS requires fixed or built-in benches to have a full back support or to be affixed to a wall. When more than one bench is provided, the ORAG requires 50% of the benches to have back support. In addition, one armrest must be provided on at least 50% of the benches with back support. In determining where to place an armrest, designers should consider the visitors who will use the site where the bench will be located. An armrest is helpful for the growing number of people who have difficulty rising to a standing position from a seat. A bench with a backrest and one armrest in the middle or at one end accommodates both types of individuals. If provided at an end, the armrest should not be located at same end as the clear floor or ground space so as to not interfere with someone in a wheelchair transferring onto the bench.

6.1.4 Clear Floor or Ground Space. **At least one** clear floor or ground space for benches that complies with 305.3 of the ABAAS for a forward or parallel approach shall be provided. **This space shall not overlap with the AR .**

6.1.5 Slope. **The slope of the clear floor or ground space for benches shall not exceed 1:33 (3%) in any direction.**

> Exception. **Section 6.1.5 does not apply where one or more conditions for departure in section 1.1 exist.**

6.1.6 Surface. **The surface of the clear floor or ground space for benches shall be firm and stable. The type of surface should be appropriate to the setting and level of development.**

> Exception. **Section 6.1.6 does not apply where one or more conditions for departure in section 1.1 exist.**

6.2 TRASH, RECYCLING, AND OTHER ESSENTIAL CONTAINERS

6.2.1 General. **Where trash, recycling, and other essential containers are provided, each shall comply with section 6.2.1. Each trash, recycling or other essential container provided at a recreation site shall be connected to an AR complying with section 2.0.**

Connection to an AR is not required for trash, recycling, and other essential containers provided in the GTRF.

> Exception. **Fifty percent of the bins in multi-bin containers are exempt from section 6.2.1.**

6.2.2 Clear Floor or Ground Space. Clear floor or ground space for trash, recycling, and other essential containers that complies with 305.3 of the ABAAS and is positioned for a forward or parallel approach shall be provided. This space shall not overlap the AR.

6.2.3 Slope. **The slope of the clear floor or ground space for trash, recycling, and other essential containers shall not exceed 1:50 (2%) in any direction.**

> **Exception.** Where surface conditions require a slope greater than 1:50 (2%) for proper drainage, a slope of no more than 1:33 (3%) for the clear floor or ground space for trash, recycling, and other essential containers is permitted.

6.2.4 Surface. **The surface of the clear floor or ground space for trash, recycling, and other essential containers shall be firm and stable. The type of surface should be appropriate to the setting and level of development.**

6.2.5 Controls and Operating Mechanisms for Trash, Recycling, and Other Essential Containers

Controls and operating mechanisms **are required to comply with the technical provisions in the** ABAAS for **clear floor or ground space (305); reach ranges (308); and operating controls (309). Section 309 of the ABAAS requires controls to be operable with one hand, without pinching, grasping, or twisting the wrist, with no more than 5 pounds of pressure. If a control mechanism can be operated with one closed fist, with no more than 5 pounds of pressure, it should be in compliance.**

Because of the **need to provide animal control** in the design of hinged lids and other operating controls for trash, recycling, food storage, and other essential containers that attract large animals, a force greater than 5 pounds is often required to access these containers. The ORAG exempts hinged lids and controls on trash, recycling, and other essential containers from 309.4 of the ABAAS until hinged lids and controls that comply with that provision while meeting animal control requirements are readily available.

> Exception. **The requirements of 309.4** of the ABAAS **do not apply to hinged lids and controls on trash, recycling, and other essential containers until hinged lids and or other controls that comply with 309.4 of the ABAAS while meeting animal control requirements are readily available.**

6.3 VIEWING AREAS AT OVERLOOKS

6.3.1 General. **Where viewing areas at overlooks are provided, each shall comply with section 6.3. Each viewing area at overlooks at a recreation site shall be located along an AR complying with section 2.0.**

> Exception 1. **Where multiple viewing areas at overlooks are provided, at least one of each viewing opportunity for distinct points of interest shall be accessible.**
>
> Exception 2. **Section 6.3.1 does not apply where one or more conditions for departure in section 1.1 exist.**

6.3.2 Unrestricted Viewing Opportunities. Each viewing area that is required to be accessible by section 6.3.1 shall provide at least one unrestricted viewing opportunity that accommodates eye levels between 32 inches (815 mm) minimum and 51 inches (1295 mm) maximum above the ground or floor.

> Exception. **Section 6.3.2 does not apply where one or more conditions for departure in section 1.1 exist.**

6.3.3 Maneuvering Space. **Each viewing area that is required to be accessible by section 6.3.1 shall have at least one maneuvering space that complies with 304.3** of the ABAAS**.**

6.3.4 Slope. **The maneuvering space required by section 6.3.3 shall have a slope of no more than 1:50 (2%) in any direction.**

> **Exception.** Where surface conditions require a slope greater than 1:50 (2%) for proper drainage, a slope of no more than 1:33 (3%) for the maneuvering space required by section 6.3.3 is permitted.

Exception. **Section 6.3.4 does not apply where one or more conditions for departure in section 1.1 exist.**

6.3.5 Surface. **The surface of maneuvering space required by section 6.3.3 shall be firm and stable. The type of surface should be appropriate to the setting and level of development.**

Exception. **Section 6.3.5 does not apply where one or more conditions for departure in section 1.1 exist.**

e type of surface should be appropriate to the setting and level of development.

6.6 TOILET BUILDINGS AT RECREATION SITES

Vault toilets, flush toilets, and composting toilets are all common at recreation sites. None of them are pit toilets, and all of them must meet the ABAAS requirements for toilet buildings. Regardless of their waste disposal system and design, toilet buildings that are located at such recreation sites and that have one riser must comply with the requirements for toilet and bathing rooms in 603 of the ABAAS. Toilet buildings that are located at developed recreation sites and that have multiple risers must comply with the requirements in 604 of the ABAAS. Designers should be careful not to confuse the requirements for toilet stalls with the requirements for single-riser toilet rooms. Each toilet building at a recreation site also must comply with the ABAAS requirements for grab bars, controls, and dispensers.

6.7 PIT TOILETS IN GENERAL FOREST AREAS

Pit toilets are primitive outhouses. Like other constructed elements in the forest, pit toilets are provided primarily for resource protection, rather than visitor comfort and convenience. Pit toilets may consist simply of a hole dug in the ground covered by a toilet riser. The pit toilet riser may or may not be surrounded by walls and may or may not have a roof. Pit toilets may be permanently installed or may be moved from one location to another as the pit is filled or the area becomes severely impacted from use. Waste in pit toilets may be disposed of directly into the pit or may be composted.

The design of pit toilets varies widely depending on the setting, the amount of expected use, and the process used to manage the waste. An accessible pit toilet is not required to have walls, a floor, a door, or a roof. However, if a pit toilet has a riser and toilet seat, the total height of the seat and the riser must be 17 to 19 inches above the ground or floor. The riser should have vertical sides, a

flat area on either side of the seat that is approximately 3 inches wide, and a seat cover that also functions as a back rest.

If the pit toilet has a constructed floor, per 304.3 of the ABAAS, it must accommodate, clear of obstructions, either a circular turning space 60 inches in diameter or a T-shaped turning space within a 60-inch square. **If a door is provided, it must open out, slide, or otherwise not obstruct the clear floor or ground space in the pit toilet.**

If the pit toilet has walls that will sustain 250 pounds of force, grab bars complying with 604.5 and **609 of** the ABAAS must be mounted on the walls. Privacy screens that do not support 250 pounds of force may be used at pit toilets. However, for safety reasons, grab bars must not be mounted on these lightweight screens.

Effort should be made to locate a pit toilet entrance at ground level. Some pit toilets are designed to process waste, which requires the riser to be placed above the processing unit. For these toilets, use a slope that permits the entrance to remain at ground level. If the layout of the site requires the pit toilet floor to be located above the ground, a trail or ramp must be provided from the ground to the entrance.

If a trail or ramp is not feasible because one or more conditions for departure in section 1.1 exist, steps into the pit toilet may be provided, but only as a last resort. If steps have to be used, specifications for steps similar to those used in accessible play areas are enumerated in the ORAG. These steps can serve as transfer landings. The step treads must be at least 14 inches deep and 36 inches wide, and the step riser should be between 6 and 9 inches high. A level clear floor or ground space that is 30 inches by 48 inches must be provided along one side of the steps. One of the steps must fall between 17 and 19 inches above the clear floor or ground space. Single steps are hazards and should be avoided. Where steps are necessary, at least two steps, but preferably three, should be provided.

6.7.1 General. **All pit toilets provided in The GTRF shall comply with section 6.7.**

6.7.2 Height. **The** total height of the toilet seat and the riser for a pit toilet shall be between 17 to 19 inches above the ground or floor.

6.7.3 Clear Floor or Ground Space in Pit Toilets Enclosed by Walls. **In pit toilets with 4 walls or privacy screens, a clear floor or ground space of 60 inches (1525 mm) by 56 inches (1420 mm) that complies with 604.3.1** of the ABAAS **shall be provided.** Turning space that complies with 304.3 of the

ABAAS must also be provided. The space must be either 60 inches (1525 mm) in diameter or a 60 inch x 60 inch (1525 mm x 1525mm) "T" shape with minimum 36 inch (915mm) wide arms and base. **Portions of this turning space may overlap the interior clear floor or ground space or be located directly outside the entrance.** The center line of the toilet riser shall be 16 to 18 inches from the back wall, and the back of the riser shall be flush with a sidewall.

> Exception. **The clear floor or ground space required by 604.3.1** of the ABAAS may **be reduced to 56 inches (1420 mm) by 48 inches (1220 mm) where one or more conditions for departure in section 1.1 exist.**

6.7.4 Doorways. **Doorways of pit toilets shall have a clear width of at least 32 inches (815 mm) to comply with 308 and 404.2.7** of the ABAAS**. If a door is provided, it shall open out, slide, or otherwise not obstruct the clear floor or ground space inside a pit toilet. To comply with 404.2.7** of the ABAAS, **any door hardware provided shall be operable with one hand, without pinching, grasping, or twisting the wrist, with no more than 5 pounds of pressure.**

6.7.5 Grab Bars. **If a pit toilet has walls that can withstand 250 pounds of force, grab bars complying with 604.5 and 609** of the ABAAS **shall be provided. Grab bars shall not be installed in a** pit toilet with lightweight privacy screens.

6.7.6 Clear Floor or Ground Space in Pit Toilets That Are Not Enclosed by Walls. **In pit toilets with fewer than 4 walls or privacy screens, a clear floor or ground space of 60 inches (1525 mm) by 56 inches (1420 mm) that complies with 604.3.1** of the ABAAS **shall be provided.**

> Exception. **The clear floor or ground space required by 604.3.1** of the ABAAS **may be reduced to 56 inches (1420 mm) by 48 inches (1220 mm) where one or more conditions for departure in section 1.1 exist.**

6.7.7 Slope. **The slope of the clear floor or ground space required by sections 6.7.3, 6.7.6, and 6.7.9 shall not exceed 1:50 (2%) in any direction.**

> **Exception 1.** Where surface conditions require a slope greater than 1:50 (2%) for proper drainage, a slope of no more than 1:33 (3%) for the clear floor or ground space required by **sections 6.7.3, 6.7.6, and 6.7.9** is permitted.
>
> Exception 2. **Section 6.7.7 does not apply where one or more conditions for departure in section 1.1 exist.**

6.7.8 Surface. **The surface of the clear floor or ground space required by section 6.7.3, 6.7.6, and 6.7.9 shall be firm and stable. The type of surface should be appropriate to the setting and level of development.**

Exception. **Section 6.7.8 does not apply where one or more conditions for departure in section 1.1 exist.**

6.7.9 Entrance. The entrance to a pit toilet should be at ground level.

Exception 1. If the floor of a pit toilet has to be located above the ground because of operation and maintenance requirements for the pit toilet, a trail shall be provided from the ground to the entrance. The trail shall comply with section 7.3 of the FSTAG.

Exception 2. Where the floor of a pit toilet is located above the ground and a trail from the ground to the entrance is not feasible because one or more conditions for departure in section 1.1 exist, steps may be provided. The steps that lead up to the toilet building shall comply with the following:

(1) Step Tread. The step tread shall be at least 14 inches (355 mm) deep and at least 36 inches (610 mm) wide.

(2) Step Riser. The step riser shall be no more than 9 inches (205 mm) high and shall be uniform for all connected steps. Where multiple steps are required, one step shall be at least 17 inches (430 mm) but no more than 19 inches (485 mm) above the ground, so that the step can function as a transfer platform.

(3) Clear Floor or Ground Space. To comply with 305.3 of the ABAAS, clear floor or ground space of at least 30 inches (760 mm) by 48 inches (1220 mm) shall be provided adjacent to one unobstructed side of the steps and shall be positioned so that a person in a wheelchair can transfer onto a step that is at least 17 inches (430 mm) but no more than 19 inches (485 mm) above the clear floor or ground space.

6.9 OUTDOOR RINSING SHOWERS

6.9.1. General. **Where outdoor rinsing showers are provided, at least one shall be a low shower complying with sections 6.9.2 and 6.9.4 through 6.9.7, and at least one shall be a high shower complying with sections 6.9.3 and 6.9.4 through 6.9.7. Where only one outdoor rinsing shower is provided, it shall comply with sections 6.9.2, 6.9.3, and 6.9.4 through 6.9.7.**

Outdoor rinsing showers that are required to comply with section 6.9 shall be connected to an AR complying with section 2.0.

6.9.2 Low Outdoor Rinsing Showers

6.9.2.1 Height. A fixed showerhead on a low outdoor rinsing shower shall be located at least 48 inches (1220 mm) but no more than 54 inches (1370 mm) **above the ground or floor.**

> Exception. **A hand-held shower spray unit complying with 608.6** of the ABAAS **is permitted.**

6.9.2.2 Grab Bars. **Grab bars complying with 609** of the ABAAS shall be provided for low outdoor rinsing showers **and shall be mounted to withstand 250 pounds of force. In addition, at least one grab bar shall comply with section 6.9.2.3, 6.9.2.4, or 6.9.2.5.**

6.9.2.3 Vertical Grab Bar. **Where the shower head for a low outdoor rinsing shower is mounted on a post and a vertical grab bar is provided, the grab bar shall be installed under the shower head no more than 33 inches (840 mm) above the floor and shall extend at least to within 3 inches (75 mm) of the shower head.**

6.9.2.4 Circular Grab Bar. **Where the shower head for a low outdoor rinsing shower is mounted on a post and a circular grab bar is provided, the grab bar shall be installed under the shower head at least 33 inches (840 mm) but no more than 36 inches (915 mm) above the floor.**

6.9.2.5 Horizontal Grab Bar. **Where a horizontal grab bar is provided for a low outdoor rinsing shower, the grab bar shall extend at least 18 inches (455 mm) in both directions from the center line of the shower head and shall be installed under the shower head at least 33 inches (840 mm) but no more than 36 inches (915 mm) above the floor.**

6.9.3 High Outdoor Rinsing Showers

6.9.3.1 Height. A fixed shower head on a high outdoor rinsing shower shall be located at least 72 inches (1830 mm) above the ground or floor.

> Exception. **A hand-held shower spray unit complying with 608.6** of the ABAAS **is permitted.**

6.9.3.2 Grab Bars. **Grab bars complying with 609** of the ABAAS **shall be provided for high outdoor rinsing showers and shall be mounted to**

withstand 250 pounds of force. In addition, at least one grab bar shall comply with section 6.9.3.3, 6.9.3.4, or 6.9.3.5.

6.9.3.3 Vertical Grab Bar. **Where the shower head for a high outdoor rinsing shower is mounted on a post and a vertical grab bar is provided, the grab bar shall be installed under the shower head no more than 33 inches (840 mm) above the floor and shall extend at least to within 3 inches (75 mm) of the shower head.**

6.9.3.4 Circular Grab Bar. **Where the shower head for a high outdoor rinsing shower is mounted on a post and a circular grab bar is provided, the grab bar shall be installed under the shower head at least 33 inches (840 mm) but no more than 36 inches (915 mm) above the floor.**

6.9.3.5 Horizontal Grab Bar. **Where a horizontal grab bar is provided for a high outdoor rinsing shower, the grab bar shall extend at least 18 inches (455 mm) in both directions from the center line of the shower head and shall be installed under the shower head at least 33 inches (840 mm) but no more than 36 inches (915 mm) above the floor.**

6.9.4 Controls. **Controls for outdoor rinsing showers shall comply with 308 and 309.4** of the ABAAS**. If self-closing controls are used, the controls shall remain open for at least 10 seconds.**

6.9.5 Clear Floor or Ground Space. **A clear floor or ground space of at least 60 inches (1525 mm) in diameter shall be provided for outdoor rinsing showers and shall be located so that the water from the shower head is directed toward the center of the clear floor or ground space.**

6.9.6 Slope. **The slope of the clear floor or ground space for outdoor rinsing showers shall not exceed 1:33 (3%) in any direction.**

6.9.7 Surface. **The surface of the clear floor or ground space for outdoor rinsing showers shall be firm and stable. The type of surface should be appropriate to the setting and level of development.**

6.10 Use of the International Symbol of Accessibility (ISA) and Other Signs

6.10.1 General. **Per F216** of the ABAAS**, the ISA shall be posted at the following six locations:**

- **Accessible parking spaces in parking lots where there are 5 or more designated parking spaces, including accessible parking spaces.**
- **Accessible loading zones.**

- **Accessible restrooms and bathing facilities.**

- If the main entrance to a building is not accessible, in the vicinity of the closest accessible entrance.

- **Accessible means of egress out of a building.**

- **Accessible areas of refuge inside multi-story buildings.**

In addition, the ISA may be posted at the entrance to recreation areas, **but only where all constructed features of the recreation area comply with applicable provisions of the** ABAAS **or FSORAG. The ISA shall not be posted at accessible camping units or other accessible constructed features.**

6.10.2 Color of the ISA. **Per 703.7** of the ABAAS, **the ISA shall be posted in high-contrast colors. The ISA is not required to be blue and white when posted on federal lands. To be enforceable at accessible parking spaces, the ISA must comply with** Manual on Uniform Traffic Control Devices **(MUTCD) 2B.35, which requires the ISA to be displayed in blue and white. Pavement markings designating accessible parking spaces must be blue, per MUTCD 3A.05.**

6.10.3 Signs in General. If materials need to be obtained from or manipulated on a sign or kiosk, the sign or kiosk shall be designed to meet the reach ranges in 308 of the ABAAS.

APPENDIX

Provisions of the Architectural Barriers Act Accessibility Guidelines that are referenced in the ORAG Technical Provisions

The Architectural Barriers Act Accessibility Guidelines are contained in the ABA chapters 1 and 2 and 3 through 10 of the Americans with Disabilities Act / Architectural Barriers Act Accessibility Guidelines.

F221.2.1.1 - Assembly Areas

(a) In places of assembly with fixed seating accessible wheelchair locations shall comply with 802 of the Architectural Barriers Act Accessibility Guidelines and shall be provided consistent with the following table:

F221.2.1.1 Number of Wheelchair Spaces in Assembly Areas

Number of Seats	Minimum Number of Required Wheelchair Spaces
4 to 25	1
26 to 50	2
51 to 150	4
151 to 300	5
301 to 500	6
501 to 5000	6, plus 1 for each 150, or fraction thereof, between 501 through 5000
5001 and over	36, plus 1 for each 200, or fraction thereof, over 5000

F221.2.2 - Integration

Wheelchair spaces shall be an integral part of the seating plan.

304 - Turning Space

304.1 General. Turning space shall comply with 304.

304.2 Floor or Ground Surfaces. Floor or ground surfaces of a turning space shall comply with 302. Changes in level are not permitted.

EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

Advisory 304.2 Floor or Ground Surface Exception. As used in this section, the phrase "changes in level" refers to surfaces with slopes and to surfaces with abrupt rise exceeding that permitted in Section 303.3. Such changes in level are prohibited in required clear floor and ground spaces, turning spaces, and in similar spaces where people using wheelchairs and other mobility devices must park their mobility aids such as in wheelchair spaces, or maneuver to use elements such as at doors, fixtures, and telephones. The exception permits slopes not steeper than 1:48.

304.3 Size. Turning space shall comply with 304.3.1 or 304.3.2.

304.3.1 Circular Space. The turning space shall be a space of 60 inches (1525 mm) diameter minimum. The space shall be permitted to include knee and toe clearance complying with 306.

304.3.2 T-Shaped Space. The turning space shall be a T-shaped space within a 60 inch (1525 mm) square minimum with arms and base 36 inches (915 mm) wide minimum. Each arm of the T shall be clear of obstructions 12 inches (305 mm) minimum in each direction and the base shall be clear of obstructions 24 inches (610 mm) minimum. The space shall be permitted to include knee and toe clearance complying with 306 only at the end of either the base or one arm.

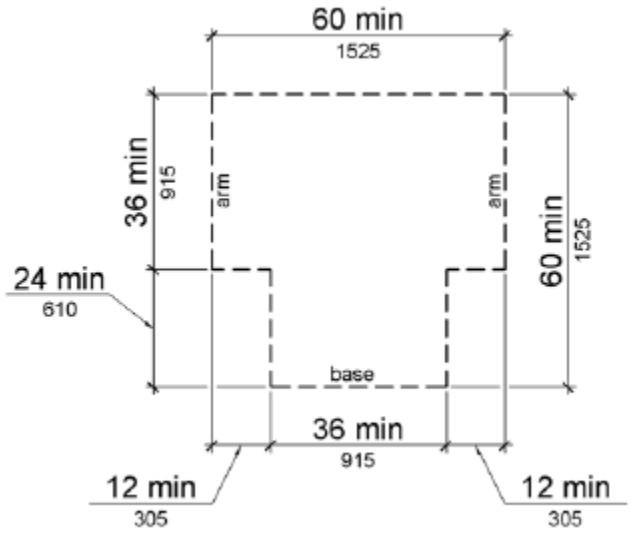


Figure 304.3.2 T-Shaped Turning Space

305 - Clear Floor or Ground Space for Wheelchairs.

305.1 General. Clear floor or ground space shall comply with 305.

305.2 Floor or Ground Surfaces. Floor or ground surfaces of a clear floor or ground space shall comply with 302. Changes in level are not permitted.

EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

305.3 Size. The clear floor or ground space shall be 30 inches (760 mm) minimum by 48 inches (1220 mm) minimum.

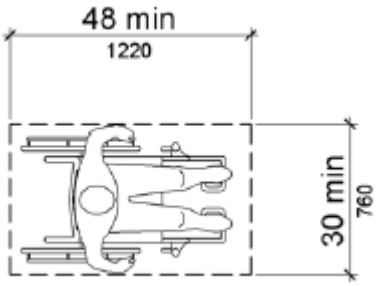


Figure 305.3 Clear Floor or Ground Space

305.4 Knee and Toe Clearance. Unless otherwise specified, clear floor or ground space shall be permitted to include knee and toe clearance complying with 306.

305.5 Position. Unless otherwise specified, clear floor or ground space shall be positioned for either forward or parallel approach to an element.

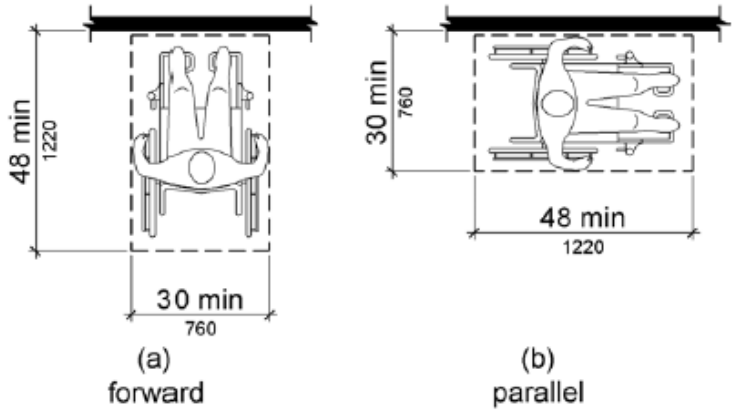


Figure 305.5 Position of Clear Floor or Ground Space

305.6 Approach. One full unobstructed side of the clear floor or ground space shall adjoin an accessible route or adjoin another clear floor or ground space.

305.7 Maneuvering Clearance. Where a clear floor or ground space is located in an alcove or otherwise confined on all or part of three sides, additional maneuvering clearance shall be provided in accordance with 305.7.1 and 305.7.2.

305.7.1 Forward Approach. Alcoves shall be 36 inches (915 mm)wide minimum where the depth exceeds 24 inches (610 mm).

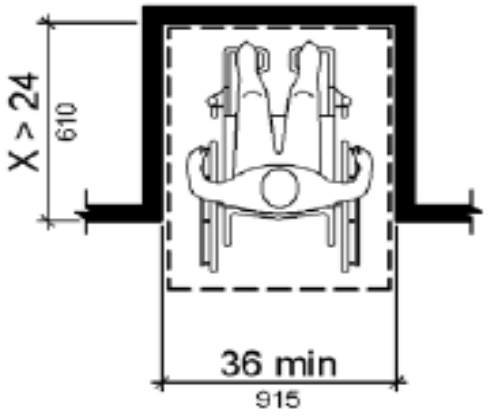


Figure 305.7.1 Maneuvering Clearance in an Alcove, Forward Approach

305.7.2 Parallel Approach. Alcoves shall be 60 inches (1525 mm) wide minimum where the depth exceeds 15 inches (380 mm).

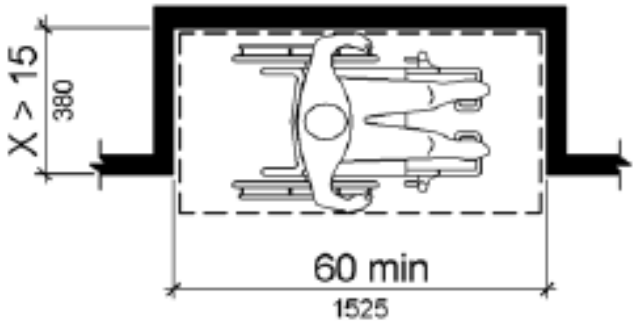


Figure 305.7.2 Maneuvering Clearance in an Alcove, Parallel Approach

306 Knee and Toe Clearance

306.1 General. Where space beneath an element is included as part of clear floor or ground space or turning space, the space shall comply with 306. Additional space shall

not be prohibited beneath an element but shall not be considered as part of the clearfloor or ground space or turning space.

Advisory 306.1 General. Clearances are measured in relation to the usable clear floor space, not necessarily to the vertical support for an element. When determining clearance under an object for required turning or maneuvering space, care should be taken to ensure the space is clear of any obstructions.

306.2 Toe Clearance.

306.2.1 General. Space under an element between the finish floor or ground and 9 inches (230 mm) above the finish floor or ground shall be considered toe clearance and shall comply with 306.2.

306.2.2 Maximum Depth. Toe clearance shall extend 25 inches (635 mm) maximum under an element.

306.2.3 Minimum Required Depth. Where toe clearance is required at an element as part of a clear floor space, the toe clearance shall extend 17 inches (430 mm) minimum under the element.

306.2.4 Additional Clearance. Space extending greater than 6 inches (150 mm) beyond the available knee clearance at 9 inches (230 mm) above the finish floor or ground shall not be considered toe clearance.

306.2.5 Width. Toe clearance shall be 30 inches (760 mm) wide minimum.

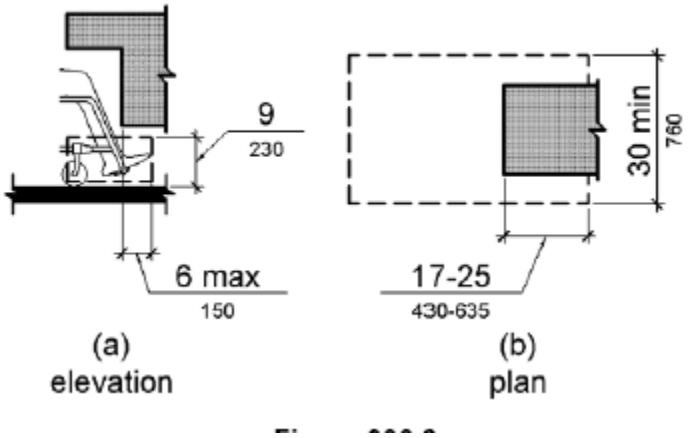


Figure 306.2 Toe Clearance

306.3 Knee Clearance.

306.3.1 General. Space under an element between 9 inches (230 mm) and 27 inches (685 mm) above the finish floor or ground shall be considered knee clearance and shall comply with 306.3.

306.3.2 Maximum Depth. Knee clearance shall extend 25 inches (635 mm) maximum under an element at 9 inches (230 mm) above the finish floor or ground.

306.3.3 Minimum Required Depth. Where knee clearance is required under an element as part of a clear floor space, the knee clearance shall be 11 inches (280 mm) deep minimum at 9 inches (230 mm) above the finish floor or ground, and 8 inches (205 mm) deep minimum at 27 inches (685 mm) above the finish floor or ground.

306.3.4 Clearance Reduction. Between 9 inches (230 mm) and 27 inches (685 mm) above the finish floor or ground, the knee clearance shall be permitted to reduce at a rate of 1 inch (25 mm) in depth for each 6 inches (150 mm) in height.

306.3.5 Width. Knee clearance shall be 30 inches (760 mm) wide minimum.

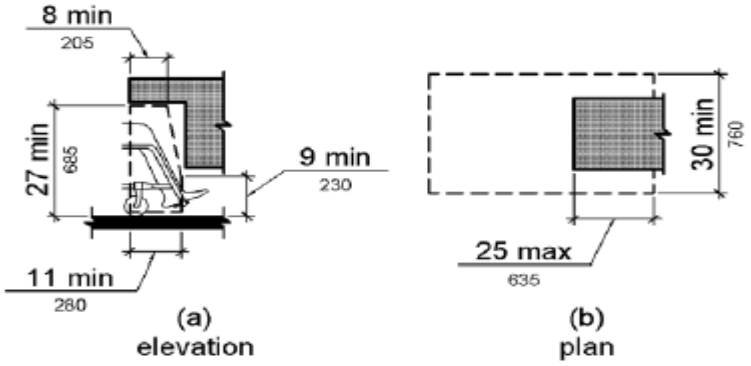


Figure 306.3 Knee Clearance

307 Protruding Objects

307.1 General. Protruding objects shall comply with 307.

307.2 Protrusion Limits. Objects with leading edges more than 27 inches (685 mm) and not more than 80 inches (2030 mm) above the finish floor or ground shall protrude 4 inches (100 mm) maximum horizontally into the circulation path.
EXCEPTION: Handrails shall be permitted to protrude 4 1/2 inches (115 mm) maximum.

Advisory 307.2 Protrusion Limits. When a cane is used and the element is in the detectable range, it gives a person sufficient time to detect the element with the cane before there is body contact. Elements located on circulation paths, including operable elements, must comply with requirements for protruding objects. For example, awnings and their supporting structures cannot reduce the minimum required vertical clearance. Similarly, casement windows, when open, cannot encroach more than 4 inches (100 mm) into circulation paths above 27 inches (685 mm).

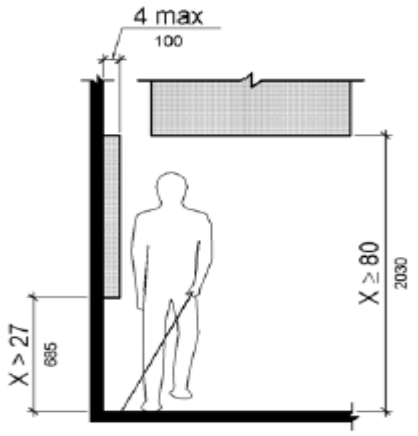


Figure 307.2Limits of Protruding Objects

307.3 Post-Mounted Objects. Free-standing objects mounted on posts or pylons shall overhang circulation paths 12 inches (305 mm) maximum when located 27 inches (685 mm) minimum and 80 inches (2030 mm) maximum above the finish floor or ground. Where a sign or other obstruction is mounted between posts or pylons and the clear distance between the posts or pylons is greater than 12 inches (305 mm), the lowest edge of such sign or obstruction shall be 27 inches (685 mm) maximum or 80 inches (2030 mm) minimum above the finish floor or ground.
EXCEPTION: The sloping portions of handrails serving stairs and ramps shall not be required to comply with 307.3.

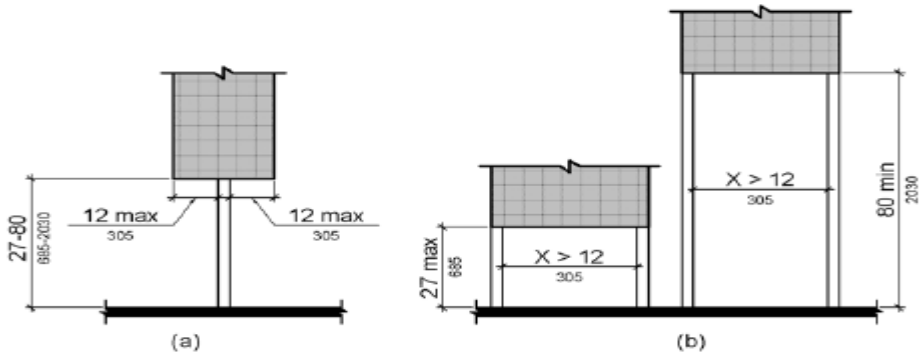


Figure 307.3 Post-Mounted Protruding Objects

307.4 Vertical Clearance. Vertical clearance shall be 80 inches (2030 mm) high minimum. Guardrails or other barriers shall be provided where the vertical clearance is less than 80 inches (2030 mm) high. The leading edge of such guardrail or barrier shall be located 27 inches (685 mm) maximum above the finish floor or ground.
EXCEPTION: Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the finish floor or ground.

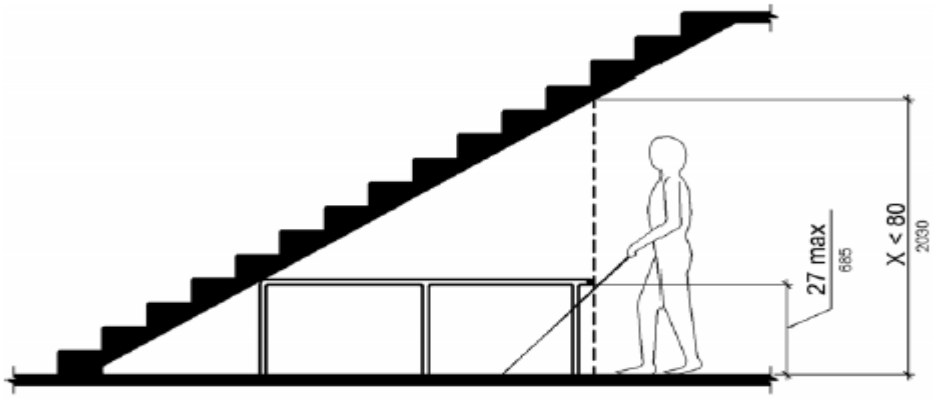


Figure 307.4 Vertical Clearance

. Protruding objects shall not reduce the clear width required for accessible routes.

308 Reach Ranges

308.1 General. Reach ranges shall comply with 308.

Advisory 308.1 General. The following table provides guidance on reach ranges for children according to age where building elements such as coat hooks, lockers, or operable parts are designed for use primarily by children. These dimensions apply to either forward or side reaches. Accessible elements and operable parts designed for adult use or children over age 12 can be located outside these ranges but must be within the adult reach ranges required by 308.

Children's Reach Ranges			
Forward or Side Reach	**Ages 3 and 4**	**Ages 5 through 8**	**Ages 9 through 12**
High (maximum)	36 in (915 mm)	40 in (1015 mm)	44 in (1120 mm)
Low (minimum)	20 in (510 mm)	18 in (455 mm)	16 in (405 mm)

308.2 Forward Reach.

308.2.1 Unobstructed. Where a forward reach is unobstructed, the high forward reach shall be 48 inches (1220 mm) maximum and the low forward reach shall be 15 inches (380 mm) minimum above the finish floor or ground.

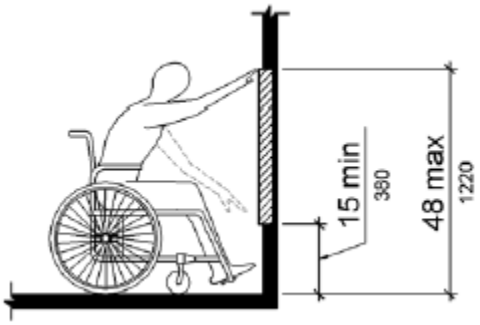


Figure 308.2.1 Unobstructed Forward Reach

308.2.2 Obstructed High Reach. Where a high forward reach is over an obstruction, the clear floor space shall extend beneath the element for a distance not less than the required reach depth over the obstruction. The high forward reach shall be 48 inches (1220 mm) maximum where the reach depth is 20 inches (510 mm) maximum. Where the reach depth exceeds 20 inches (510 mm), the high forward reach shall be 44 inches (1120 mm) maximum and the reach depth shall be 25 inches (635 mm) maximum.

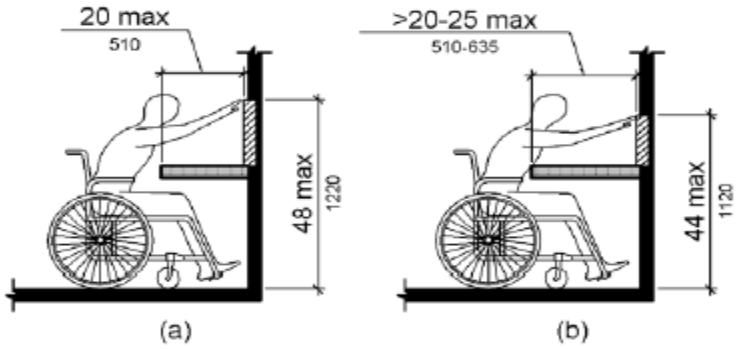


Figure 308.2.2 Obstructed High Forward Reach

308.3 Side Reach.

308.3.1 Unobstructed. Where a clear floor or ground space allows a parallel approach to an element and the side reach is unobstructed, the high side reach shall be 48 inches (1220 mm) maximum and the low side reach shall be 15 inches (380 mm) minimum above the finish floor or ground.

EXCEPTIONS:

1. An obstruction shall be permitted between the clear floor or ground space and the element where the depth of the obstruction is 10 inches (255 mm) maximum.

2. Operable parts of fuel dispensers shall be permitted to be 54 inches (1370 mm) maximum measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

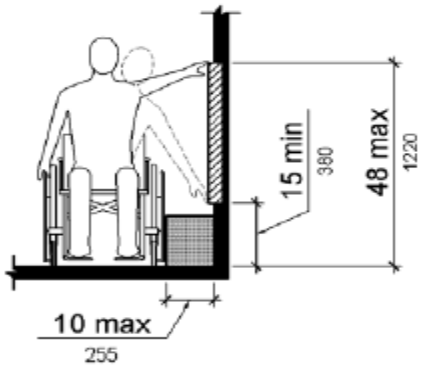


Figure 308.3.1 Unobstructed Side Reach

308.3.2 Obstructed High Reach. Where a clear floor or ground space allows a parallel approach to an element and the high side reach is over an obstruction, the height of the obstruction shall be 34 inches (865 mm) maximum and the depth of the obstruction shall be 24 inches (610 mm) maximum. The high side reach shall be 48 inches (1220 mm) maximum for a reach depth of 10 inches (255 mm) maximum. Where the reach depth exceeds 10 inches (255 mm), the high side reach shall be 46 inches (1170 mm) maximum for a reach depth of 24 inches (610 mm) maximum.

EXCEPTIONS:

1. The top of washing machines and clothes dryers shall be permitted to be 36 inches (915 mm) maximum above the finish floor.
2. Operable parts of fuel dispensers shall be permitted to be 54 inches (1370 mm) maximum measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

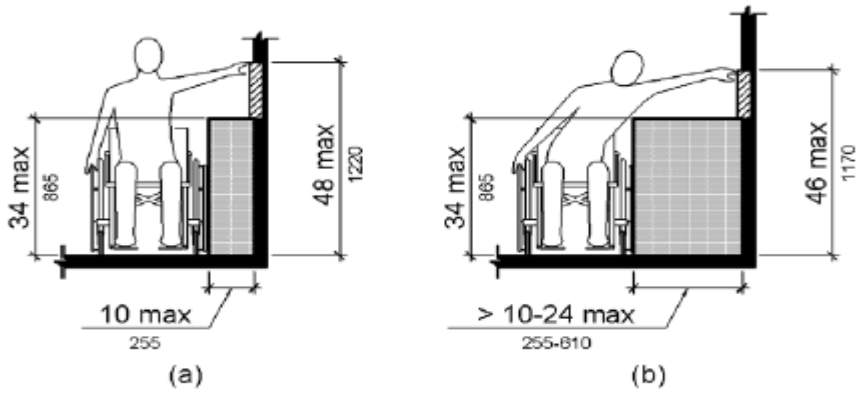


Figure 308.3.2 Obstructed High Side Reach

309 Operable Parts

309.1 General. Operable parts shall comply with 309.

309.2 Clear Floor Space. A clear floor or ground space complying with 305 shall be provided.

309.3 Height. Operable parts shall be placed within one or more of the reach ranges specified in 308.
309.4 Operation. Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2 N) maximum.
EXCEPTION:
Gas pump nozzles shall not be required to provide operable parts that have an activating force of 5 pounds (22.2 N) maximum.

404.2.3 Doorways - Clear Width. Door openings shall provide a clear width of 32 inches (815 mm) minimum. Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees. Openings more than 24 inches (610 mm) deep shall provide a clear opening of 36 inches (915 mm) minimum. There shall be no projections into the required clear opening width lower than 34 inches (865 mm) above the finish floor or ground. Projections into the clear opening width between 34 inches (865 mm) and 80 inches (2030 mm) above the finish floor or ground shall not exceed 4 inches (100 mm).

EXCEPTIONS: 1. In alterations, a projection of 5/8 inch (16 mm) maximum into the required clear width shall be permitted for the latch side stop.

2. Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the finish floor or ground.

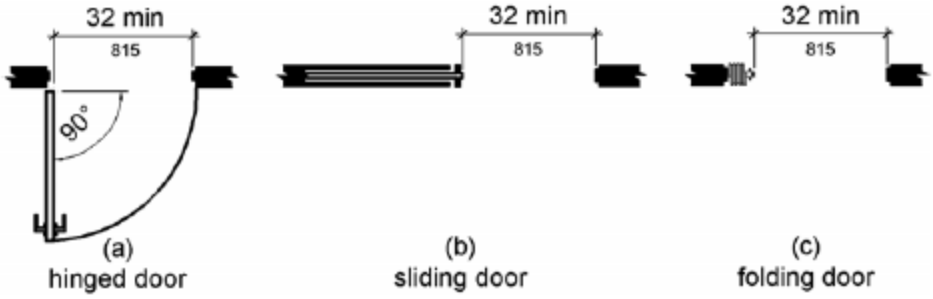


Figure 404.2.3 Clear Width of Doorways

404.2.7 Door and Gate Hardware. Handles, pulls, latches, locks, and other operable parts on doors and gates shall comply with 309.4. Operable parts of such hardware shall be 34 inches (865 mm) minimum and 48 inches (1220 mm) maximum above the finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.

504 Stairways

504.1 General. Stairs shall comply with 504.

504.2 Treads and Risers. All steps on a flight of stairs shall have uniform riser heights and uniform tread depths. Risers shall be 4 inches (100 mm) high minimum and 7 inches (180 mm) high maximum. Treads shall be 11 inches (280 mm) deep minimum.

504.3 Open Risers. Open risers are not permitted.

504.4 Tread Surface. Stair treads shall comply with 302. Changes in level are not permitted.**EXCEPTION**: Treads shall be permitted to have a slope not steeper than 1:48.

Advisory 504.4 Tread Surface. Consider providing visual contrast on tread nosings, or at the leading edges of treads without nosings, so that stair treads are more visible for people with low vision.

504.5 Nosings. The radius of curvature at the leading edge of the tread shall be 1/2 inch (13 mm) maximum. Nosings that project beyond risers shall have the underside of the leading edge curved or beveled. Risers shall be permitted to slope under the tread at an angle of 30 degrees maximum from vertical. The permitted projection of the nosing shall extend 1 1/2 inches (38 mm) maximum over the tread below.

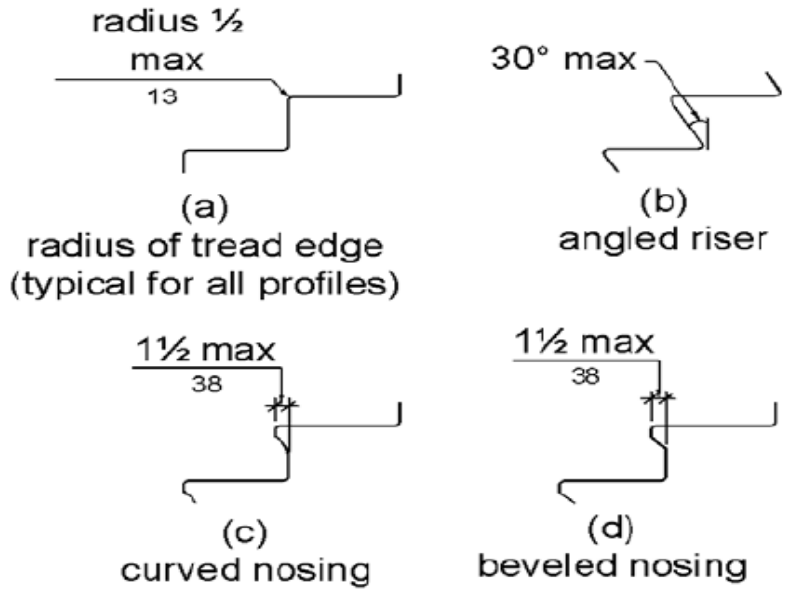


Figure 504.5 Stair Nosings

504.6 Handrails. Stairs shall have handrails complying with 505.

504.7 Wet Conditions. Stair treads and landings subject to wet conditions shall be designed to prevent the accumulation of water.

505 Handrails

505.1 General. Handrails provided along walking surfaces complying with 403, required at ramps complying with 405, and required at stairs complying with 504 shall comply with 505.

Advisory 505.1 General. Handrails are required on ramp runs with a rise greater than 6 inches (150 mm) (see 405.8) and on certain stairways (see 504). Handrails are not required on walking surfaces with running slopes less than 1:20. However, handrails are required to comply with 505 when they are provided on walking surfaces with running slopes less than 1:20 (see 403.6). Sections 505.2, 505.3, and 505.10 do not apply to handrails provided on walking surfaces with running slopes less than 1:20 as these sections only reference requirements for ramps and stairs.

505.2 Where Required. Handrails shall be provided on both sides of stairs and ramps.
EXCEPTION: In assembly areas, handrails shall not be required on both sides of aisle ramps where a handrail is provided at either side or within the aisle width.

505.3 Continuity. Handrails shall be continuous within the full length of each stair flight or ramp run. Inside handrails on switchback or dogleg stairs and ramps shall be continuous between flights or runs.
EXCEPTION: In assembly areas, handrails on ramps shall not be required to be continuous in aisles serving seating.

505.4 Height. Top of gripping surfaces of handrails shall be 34 inches (865 mm) minimum and 38 inches (965 mm) maximum vertically above walking surfaces, stair nosings, and ramp surfaces. Handrails shall be at a consistent height above walking surfaces, stair nosings, and ramp surfaces.

Advisory 505.4 Height. The requirements for stair and ramp handrails in this document are for adults. When children are the principle users in a building or facility (e.g., elementary schools), a second set of handrails at an appropriate height can assist them and aid in preventing accidents. A maximum height of 28 inches (710 mm) measured to the top of the gripping surface from the ramp surface or stair nosing is recommended for handrails designed for children. Sufficient vertical clearance between upper and lower handrails, 9 inches (230 mm) minimum, should be provided to help prevent entrapment.

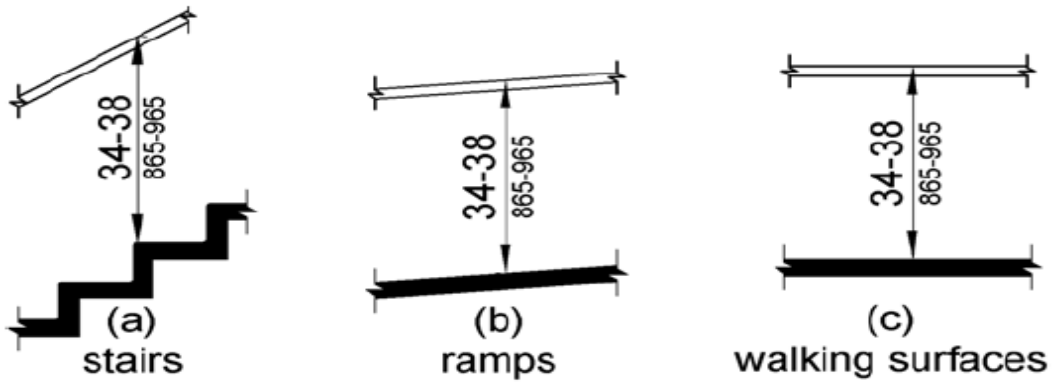


Figure 505.4 Handrail Height

505.5 Clearance. Clearance between handrail gripping surfaces and adjacent surfaces shall be 1 1/2 inches (38 mm) minimum.

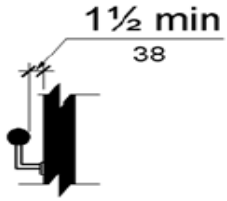


Figure 505.5 Handrail Clearance

505.6 Gripping Surface. Handrail gripping surfaces shall be continuous along their length and shall not be obstructed along their tops or sides. The bottoms of handrail gripping surfaces shall not be obstructed for more than 20 percent of their length. Where provided, horizontal projections shall occur 1 1/2 inches (38 mm) minimum below the bottom of the handrail gripping surface.

EXCEPTIONS: 1. Where handrails are provided along walking surfaces with slopes not steeper than 1:20, the bottoms of handrail gripping surfaces shall be permitted to be obstructed along their entire length where they are integral to crash rails or bumper guards.
2. The distance between horizontal projections and the bottom of the gripping surface shall be permitted to be reduced by 1/8 inch (3.2 mm) for each 1/2 inch (13 mm) of additional handrail perimeter dimension that exceeds 4 inches (100 mm).

Advisory 505.6 Gripping Surface. People with disabilities, older people, and others benefit from continuous gripping surfaces that permit users to reach the fingers outward or downward to grasp the handrail, particularly as the user senses a loss of equilibrium or begins to fall.

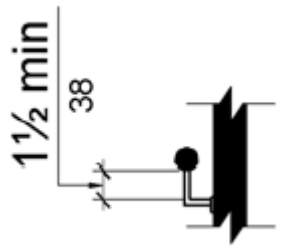


Figure 505.6 Horizontal Projections Below Gripping Surface

505.7 Cross Section. Handrail gripping surfaces shall have a cross section complying with 505.7.1 or 505.7.2.

505.7.1 Circular Cross Section. Handrail gripping surfaces with a circular cross section shall have an outside diameter of 1 1/4 inches (32 mm) minimum and 2 inches (51 mm) maximum.

505.7.2 Non-Circular Cross Sections. Handrail gripping surfaces with a non-circular cross section shall have a perimeter dimension of 4 inches (100 mm) minimum and 6 1/4 inches (160 mm) maximum, and a cross-section dimension of 2 1/4 inches (57 mm) maximum.

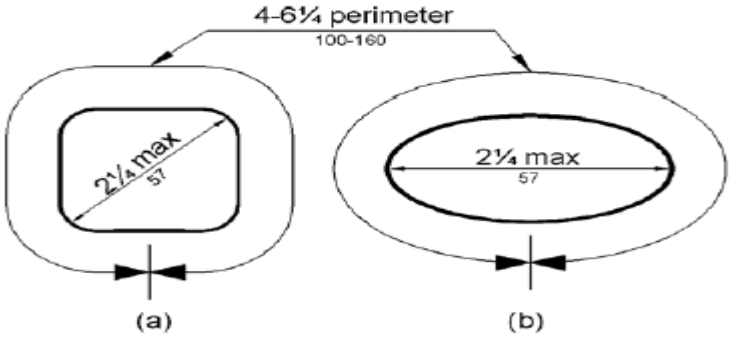


Figure 505.7.2 Handrail Non-Circular Cross Section

505.8 Surfaces. Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges.

505.9 Fittings. Handrails shall not rotate within their fittings.
505.10 Handrail Extensions. Handrail gripping surfaces shall extend beyond and in the same direction of stair flights and ramp runs in accordance with 505.10.
EXCEPTIONS: 1. Extensions shall not be required for continuous handrails at the inside turn of switchback or dogleg stairs and ramps.
2. In assembly areas, extensions shall not be required for ramp handrails in aisles serving seating where the handrails are discontinuous to provide access to seating and to permit crossovers within aisles.
3. In alterations, full extensions of handrails shall not be required where such extensions would be hazardous due to plan configuration.

505.10.1 Top and Bottom Extension at Ramps. Ramp handrails shall extend horizontally above the landing for 12 inches (305 mm) minimum beyond the top and bottom of ramp runs. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent ramp run.

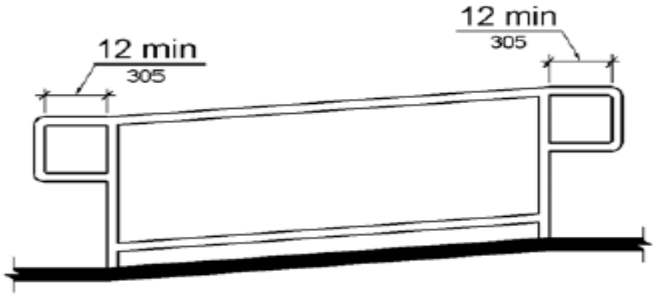


Figure 505.10.1 Top and Bottom Handrail Extension at Ramps

505.10.2 Top Extension at Stairs. At the top of a stair flight, handrails shall extend horizontally above the landing for 12 inches (305 mm) minimum beginning directly above the first riser nosing. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.

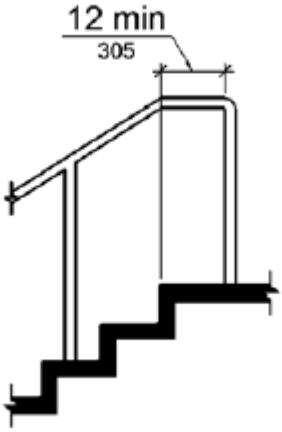


Figure 505.10.2 Top Handrail Extension at Stairs

505.10.3 Bottom Extension at Stairs. At the bottom of a stair flight, handrails shall extend at the slope of the stair flight for a horizontal distance at least equal to one tread depth beyond the last riser nosing. Extension shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.

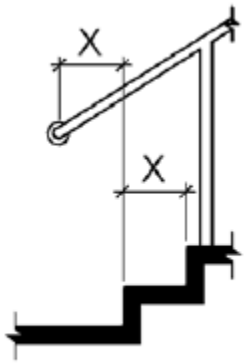


Figure 505.10.3 Bottom Handrail Extension at Stairs

603 Toilet and Bathing Rooms (for toilet buildings with a single riser such as SSTs etc.- but not for Pit toilets…see definition of pit toilet in Technical Provisions section of FSORAG)

603.1 General. Toilet and bathing rooms shall comply with 603.

603.2 Clearances. Clearances shall comply with 603.2.

603.2.1 Turning Space. Turning space complying with 304 shall be provided within the room.

603.2.2 Overlap. Required clear floor spaces, clearance at fixtures, and turning space shall be permitted to overlap.

603.2.3 Door Swing. Doors shall not swing into the clear floor space or clearance required for any fixture. Doors shall be permitted to swing into the required turning space.
EXCEPTIONS: 1. Doors to a toilet room or bathing room for a single occupant accessed only through a private office and not for common use or public use shall be permitted to swing into the clear floor space or clearance provided the swing of the door can be reversed to comply with 603.2.3.
2. Where the toilet room or bathing room is for individual use and a clear floor space complying with 305.3 is provided within the room beyond the arc of the door swing, doors shall be permitted to swing into the clear floor space or clearance required for any fixture.

Advisory 603.2.3 Door Swing Exception 1. At the time the door is installed, and if the door swing is reversed in the future, the door must meet all the requirements specified in 404. Additionally, the door swing cannot reduce the required width of an accessible route. Also, avoid violating other building or life safety codes when the door swing is reversed.

603.3 Mirrors. Mirrors located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 40 inches (1015 mm) maximum above the finish floor or ground. Mirrors not located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 35 inches (890 mm) maximum above the finish floor or ground.

Advisory 603.3 Mirrors. A single full-length mirror can accommodate a greater number of people, including children. In order for mirrors to be usable by people who are ambulatory and people and people who use wheelchairs, the top edge of mirrors should be 74 inches (1880 mm) minimum from the floor or ground.

603.4 Coat Hooks and Shelves. Coat hooks shall be located within one of the reach ranges specified in 308. Shelves shall be located 40 inches (1015 mm) minimum and 48 inches (1220 mm) maximum above the finish floor.

604 Water Closets and Toilet Compartments (for **toilet buildings with multiple risers provided at recreation sites,** with a FS Recreation Site Development Scale of 3 or higher, **and for the Exception under Pit Toilets in General Forest Areas FSORAG 6.6)**

604.1 General. Water closets and toilet compartments shall comply with 604.2 through 604.8.**EXCEPTION:** Water closets and toilet compartments for children's use shall be permitted to comply with 604.9.

604.2 Location. The water closet shall be positioned with a wall or partition to the rear and to one side. The centerline of the water closet shall be 16 inches (405 mm) minimum to 18 inches (455 mm) maximum from the side wall or partition, except that the water closet shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum from the side wall or partition in the ambulatory accessible toilet compartment specified in 604.8.2. Water closets shall be arranged for a left-hand or right-hand approach.

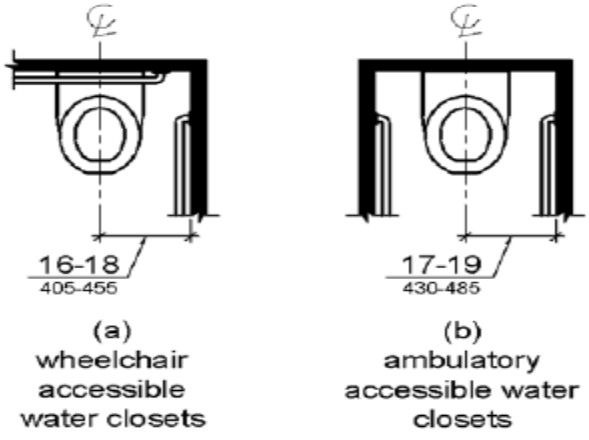


Figure 604.2 Water Closet Location

604.3 Clearance. Clearances around water closets and in toilet compartments shall comply with 604.3.

604.3.1 Size. Clearance around a water closet shall be 60 inches (1525 mm) minimum measured perpendicular from the side wall and 56 inches (1420 mm) minimum measured perpendicular from the rear wall.

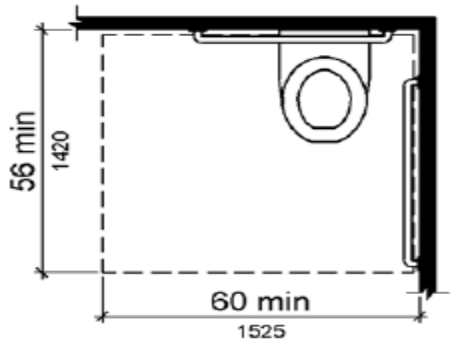


Figure 604.3.1 Size of Clearance at Water Closets

604.3.2 Overlap. The required clearance around the water closet shall be permitted to overlap the water closet, associated grab bars, dispensers, sanitary napkin disposal units, coat hooks, shelves, accessible routes, clear floor space and clearances required at other fixtures, and the turning space. No other fixtures or obstructions shall be located within the required water closet clearance.

EXCEPTION: In residential dwelling units, a lavatory complying with 606 shall be permitted on the rear wall 18 inches (455 mm) minimum from the water closet centerline where the clearance at the water closet is 66 inches (1675 mm) minimum measured perpendicular from the rear wall.

604.4 Seats. The seat height of a water closet above the finish floor shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum measured to the top of the seat. Seats shall not be sprung to return to a lifted position.

EXCEPTIONS: 1. A water closet in a toilet room for a single occupant accessed only through a private office and not for common use or public use shall not be required to comply with 604.4.

2. In residential dwelling units, the height of water closets shall be permitted to be 15 inches (380 mm) minimum and 19 inches (485 mm) maximum above the finish floor measured to the top of the seat.

604.5 Grab Bars. Grab bars for water closets shall comply with 609. Grab bars shall be provided on the side wall closest to the water closet and on the rear wall.

Advisory 604.5 Grab Bars Exception 2. Reinforcement must be sufficient to permit the installation of rear and side wall grab bars that fully meet all accessibility requirements including, but not limited to, required length, installation height, and structural strength.

604.5.1 Side Wall. The side wall grab bar shall be 42 inches (1065 mm) long minimum, located 12 inches (305 mm) maximum from the rear wall and extending 54 inches (1370 mm) minimum from the rear wall.

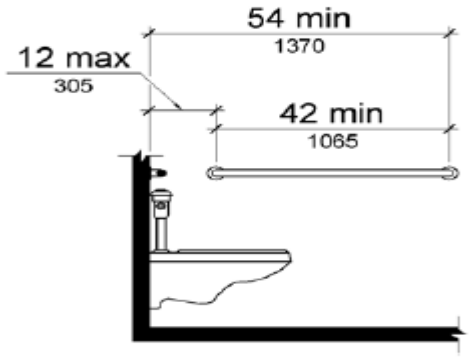


Figure 604.5.1 Side Wall Grab Bar at Water Closets

604.5.2 Rear Wall. The rear wall grab bar shall be 36 inches (915 mm) long minimum and extend from the centerline of the water closet 12 inches (305 mm) minimum on one side and 24 inches (610 mm) minimum on the other side.

EXCEPTIONS: 1. The rear grab bar shall be permitted to be 24 inches (610 mm) long minimum, centered on the water closet, where wall space does not permit a length of 36 inches (915 mm) minimum due to the location of a recessed fixture adjacent to the water closet.

2. Where an administrative authority requires flush controls for flush valves to be located in a position that conflicts with the location of the rear grab bar, then the rear grab bar shall be permitted to be split or shifted to the open side of the toilet area.

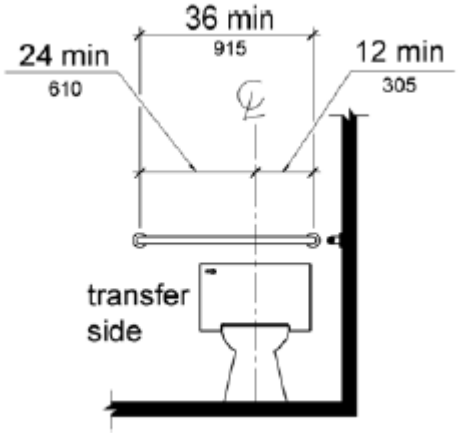


Figure 604.5.2 Rear Wall Grab Bar at Water Closets

604.6 Flush Controls. Flush controls shall be hand operated or automatic. Hand operated flush controls shall comply with 309. Flush controls shall be located on the open side of the water closet except in ambulatory accessible compartments complying with 604.8.2.

Advisory 604.6 Flush Controls. If plumbing valves are located directly behind the toilet seat, flush valves and related plumbing can cause injury or imbalance when a person leans back against them. To prevent causing injury or imbalance, the plumbing can be located behind walls or to the side of the toilet; or if approved by the local authority having jurisdiction, provide a toilet seat lid.

604.7 Dispensers. Toilet paper dispensers shall comply with 309.4 and shall be 7 inches (180 mm) minimum and 9 inches (230 mm) maximum in front of the water closet measured to the centerline of the dispenser. The outlet of the dispenser shall be 15 inches (380 mm) minimum and 48 inches (1220 mm) maximum above the finish floor and shall not be located behind grab bars. Dispensers shall not be of a type that controls delivery or that does not allow continuous paper flow.

Advisory 604.7 Dispensers. If toilet paper dispensers are installed above the side wall grab bar, the outlet of the toilet paper dispenser must be 48 inches (1220 mm) maximum above the finish floor and the top of the gripping surface of the grab bar must be 33 inches (840 mm) minimum and 36 inches (915 mm) maximum above the finish floor.

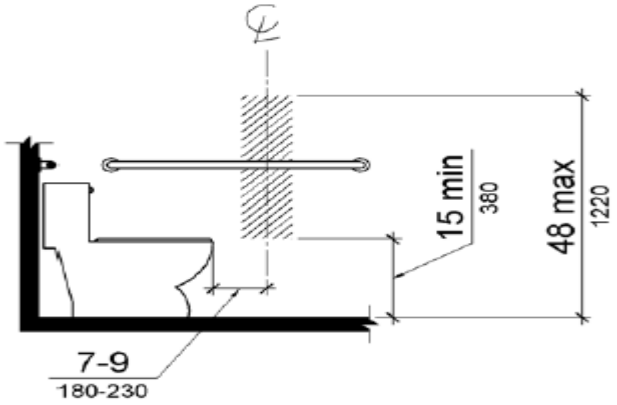


Figure 604.7 Dispenser Outlet Location

604.8 Toilet Compartments. Wheelchair accessible toilet compartments shall meet the requirements of 604.8.1 and 604.8.3. Compartments containing more than one plumbing

fixture shall comply with 603. Ambulatory accessible compartments shall comply with 604.8.2 and 604.8.3.

604.8.1 Wheelchair Accessible Compartments. Wheelchair accessible compartments shall comply with 604.8.1.

604.8.1.1 Size. Wheelchair accessible compartments shall be 60 inches (1525 mm) wide minimum measured perpendicular to the side wall, and 56 inches (1420 mm) deep minimum for wall hung water closets and 59 inches (1500 mm) deep minimum for floor mounted water closets measured perpendicular to the rear wall. Wheelchair accessible compartments for children's use shall be 60 inches (1525 mm) wide minimum measured perpendicular to the side wall, and 59 inches (1500 mm) deep minimum for wall hung and floor mounted water closets measured perpendicular to the rear wall.

Advisory 604.8.1.1 Size. The minimum space required in toilet compartments is provided so that a person using a wheelchair can maneuver into position at the water closet. This space cannot be obstructed by baby changing tables or other fixtures or conveniences, except as specified at 604.3.2 (Overlap). If toilet compartments are to be used to house fixtures other than those associated with the water closet, they must be designed to exceed the minimum space requirements. Convenience fixtures such as baby changing tables must also be accessible to people with disabilities as well as to other users. Toilet compartments that are designed to meet, and not exceed, the minimum space requirements may not provide adequate space for maneuvering into position at a baby changing table.

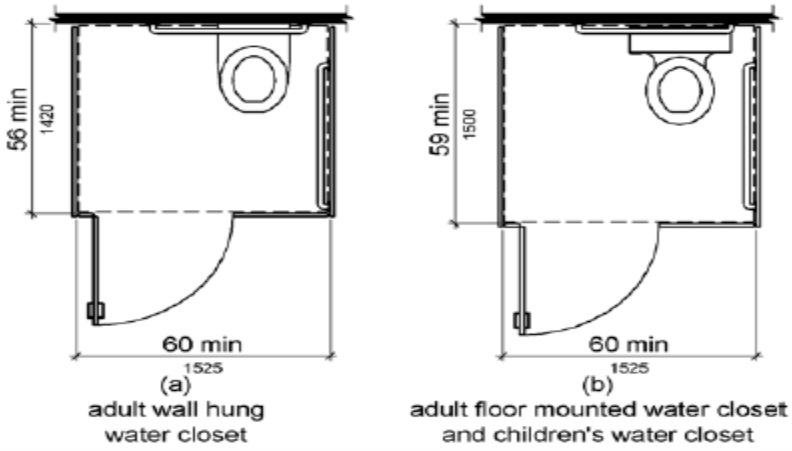


Figure 604.8.1.1 Size of Wheelchair Accessible Toilet Compartment

604.8.1.2 Doors. Toilet compartment doors, including door hardware, shall comply with 404 except that if the approach is to the latch side of the compartment door, clearance between the door side of the compartment and any obstruction shall be 42 inches (1065 mm) minimum. Doors shall be located in the front partition or in the side wall or partition

farthest from the water closet. Where located in the front partition, the door opening shall be 4 inches (100 mm) maximum from the side wall or partition farthest from the water closet. Where located in the side wall or partition, the door opening shall be 4 inches (100 mm) maximum from the front partition. The door shall be self-closing. A door pull complying with 404.2.7 shall be placed on both sides of the door near the latch. Toilet compartment doors shall not swing into the minimum required compartment area.

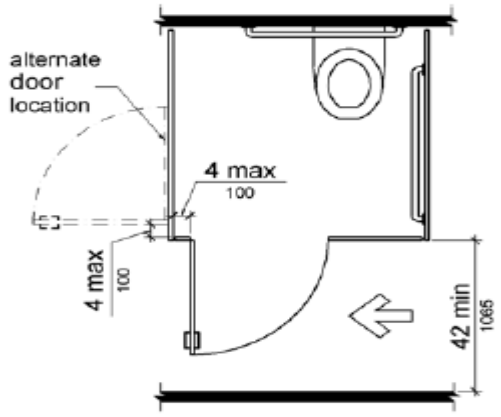


Figure 604.8.1.2 Wheelchair Accessible Toilet Compartment Doors

604.8.1.3 Approach. Compartments shall be arranged for left-hand or right-hand approach to the water closet.

604.8.1.4 Toe Clearance. The front partition and at least one side partition shall provide a toe clearance of 9 inches (230 mm) minimum above the finish floor and 6 inches (150 mm) deep minimum beyond the compartment-side face of the partition, exclusive of partition support members. Compartments for children's use shall provide a toe clearance of 12 inches (305 mm) minimum above the finish floor.

EXCEPTION: Toe clearance at the front partition is not required in a compartment greater than 62 inches (1575 mm) deep with a wall-hung water closet or 65 inches (1650 mm) deep with a floor-mounted water closet. Toe clearance at the side partition is not required in a compartment greater than 66 inches (1675 mm) wide. Toe clearance at the front partition is not required in a compartment for children's use that is greater than 65 inches (1650 mm) deep.

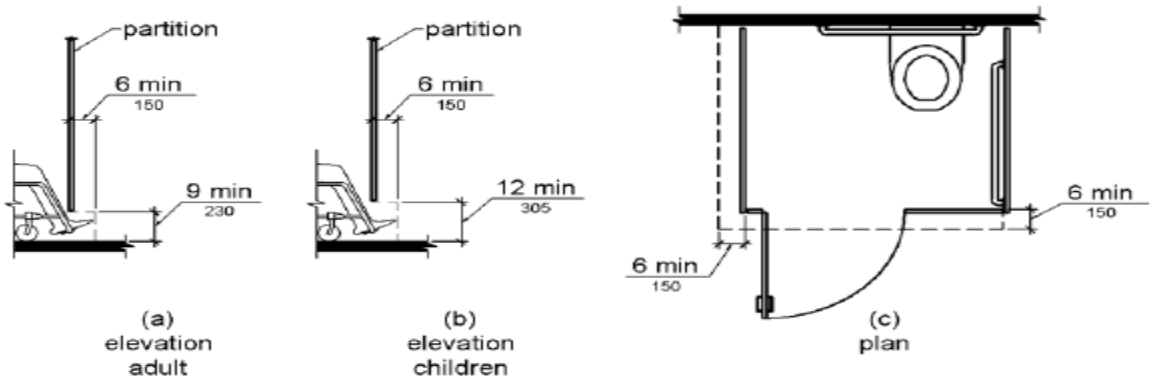


Figure 604.8.1.4 Wheelchair Accessible Toilet Compartment Toe Clearance

604.8.1.5 Grab Bars. Grab bars shall comply with 609. A side-wall grab bar complying with 604.5.1 shall be provided and shall be located on the wall closest to the water closet. In addition, a rear-wall grab bar complying with 604.5.2 shall be provided.

604.8.2 Ambulatory Accessible Compartments. Ambulatory accessible compartments shall comply with 604.8.2.

604.8.2.1 Size. Ambulatory accessible compartments shall have a depth of 60 inches (1525 mm) minimum and a width of 35 inches (890 mm) minimum and 37 inches (940 mm) maximum.

604.8.2.2 Doors. Toilet compartment doors, including door hardware, shall comply with 404, except that if the approach is to the latch side of the compartment door, clearance between the door side of the compartment and any obstruction shall be 42 inches (1065 mm) minimum. The door shall be self-closing. A door pull complying with 404.2.7 shall be placed on both sides of the door near the latch. Toilet compartment doors shall not swing into the minimum required compartment area.

604.8.2.3 Grab Bars. Grab bars shall comply with 609. A side-wall grab bar complying with 604.5.1 shall be provided on both sides of the compartment.

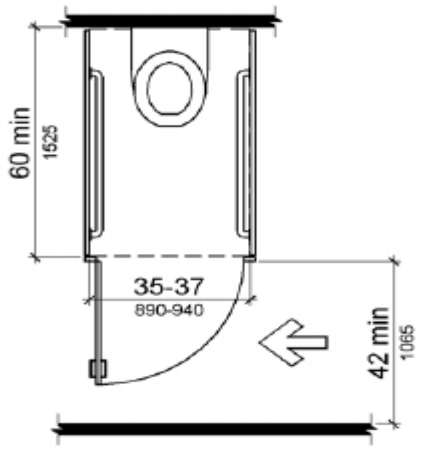


Figure 604.8.2 Ambulatory Accessible Toilet Compartment

604.8.3 Coat Hooks and Shelves. Coat hooks shall be located within one of the reach ranges specified in 308. Shelves shall be located 40 inches (1015 mm) minimum and 48 inches (1220 mm) maximum above the finish floor.

608.6 Shower Spray Unit and Water. A shower spray unit with a hose 59 inches (1500 mm) long minimum that can be used both as a fixed-position shower head and as a hand-held shower shall be provided. The shower spray unit shall have an on/off control with a non-positive shut-off. If an adjustable-height shower head on a vertical bar is used, the bar shall be installed so as not to obstruct the use of grab bars. Shower spray units shall deliver water that is 120°F (49°C) maximum.

EXCEPTION: A fixed shower head located at 48 inches (1220 mm) maximum above the shower finish floor shall be permitted instead of a hand-held spray unit in facilities that are not medical care facilities, long-term care facilities, transient lodging guest rooms, or residential dwelling units.

Advisory 608.6 Shower Spray Unit and Water. Ensure that hand-held shower spray units are capable of delivering water pressure substantially equivalent to fixed shower heads.

609 Grab Bars

609.1 General. Grab bars in toilet facilities and bathing facilities shall comply with 609.

609.2 Cross Section. Grab bars shall have a cross section complying with 609.2.1 or 609.2.2.

609.2.1 Circular Cross Section. Grab bars with circular cross sections shall have an outside diameter of 1 1/4 inches (32 mm) minimum and 2 inches (51 mm) maximum. 609.2.2 Non-Circular Cross Section. Grab bars with non-circular cross sections shall have a cross-section dimension of 2 inches (51 mm) maximum and a perimeter

dimension of 4 inches (100 mm) minimum and 4.8 inches (120 mm) maximum.

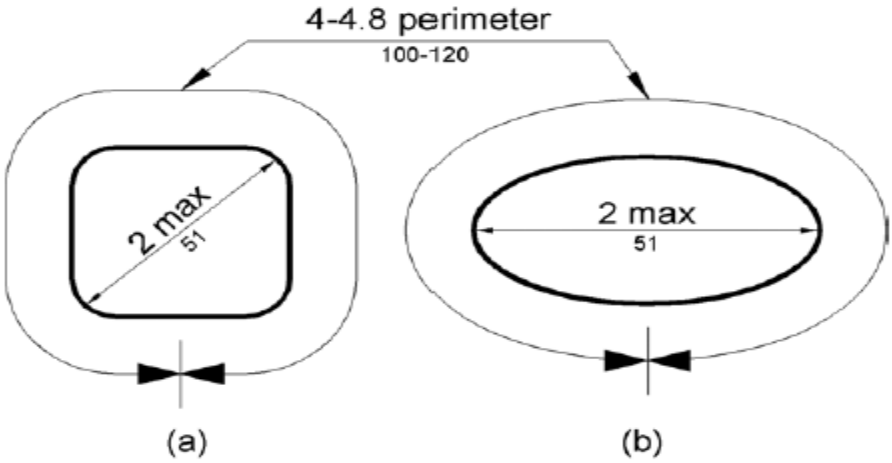


Figure 609.2.2 Grab Bar Non-Circular Cross Section

609.3 Spacing. The space between the wall and the grab bar shall be 1 1/2 inches (38 mm). The space between the grab bar and projecting objects below and at the ends shall be 1 1/2 inches (38 mm) minimum. The space between the grab bar and projecting objects above shall be 12 inches (305 mm) minimum.
EXCEPTION: The space between the grab bars and shower controls, shower fittings, and other grab bars above shall be permitted to be 1 1/2 inches (38 mm) minimum.

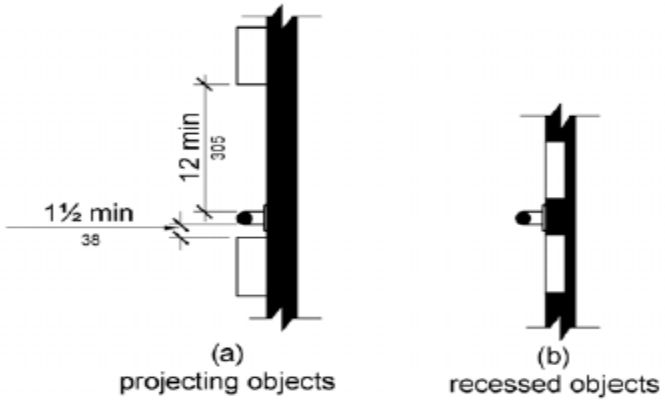


Figure 609.3 Spacing of Grab Bars

609.4 Position of Grab Bars. Grab bars shall be installed in a horizontal position, 33 inches (840 mm) minimum and 36 inches (915 mm) maximum above the finish floor measured to the top of the gripping surface, except that at water closets for children's use complying with 604.9, grab bars shall be installed in a horizontal position 18 inches (455 mm) minimum and 27 inches (685 mm) maximum above the finish floor measured to the top of the gripping surface. The height of the lower grab bar on the back wall of a bathtub shall comply with 607.4.1.1 or 607.4.2.1.

609.5 Surface Hazards. Grab bars and any wall or other surfaces adjacent to grab bars shall be free of sharp or abrasive elements and shall have rounded edges.

609.6 Fittings. Grab bars shall not rotate within their fittings.

609.7 Installation. Grab bars shall be installed in any manner that provides a gripping surface at the specified locations and that does not obstruct the required clear floor space.

609.8 Structural Strength. Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the grab bar, fastener, mounting device, or supporting structure.

SIGNAGE

F216 Signs

703.7 Symbols of Accessibility. Symbols of accessibility shall comply with 703.7.

703.7.1 Finish and Contrast. Symbols of accessibility and their background shall have a non-glare finish. Symbols of accessibility shall contrast with their background with either a light symbol on a dark background or a dark symbol on a light background.

Advisory 703.7.1 Finish and Contrast. Signs are more legible for persons with low vision when characters contrast as much as possible with their background. Additional factors affecting the ease with which the text can be distinguished from its background include shadows cast by lighting sources, surface glare, and the uniformity of the text and background colors and textures.

703.7.2 Symbols.

703.7.2.1 International Symbol of Accessibility. The International Symbol of Accessibility shall comply with Figure 703.7.2.1.

Figure 703.7.2.1 International Symbol of Accessibility

Elements and spaces of accessible facilities that shall be identified by the International Symbol of Accessibility:

- **Accessible parking spaces in parking lots with designated parking spaces (F216.5)**
  - **where a total of 5 or more, including accessible parking spaces, on a site, (F216.5.1)**
  - **No ISA at parking spurs provided at camping unit**
- **Accessible restrooms and bathing facilities.(F216.8)**
- If the main entrance to a building is not accessible, the ISA and an arrow are to be posted to direct to closest accessible. (F216.6)
- **Accessible Area of Refuge inside multi story buildings (F216.4.2)**
- **Accessible means of egress out of a building (F216.4.3)**

Great Trinity Forest Management Plan

RECREATION

Suggested List of Prohibitions

THE FOLLOWING IS A SUGGESTED LIST OF PROHIBITIONS FOR THE GREAT TRINITY RIVER FOREST:

BUILDING, MAINTAINING, OR ATTENDING A FIRE OUTSIDE OF A DESIGNATED FIRE PIT OR GRILL.

USING ANY TYPE OF EXPLOSIVE, WITHOUT WRITTEN AUTHORIZATION.

POSSESSING, DISCHARGING OR USING ANY KIND OF FIREWORK OR OTHER PYROTECHNIC DEVICE.

POSSESSION OR USE OF METAL DETECTOR, ELECTRONIC APPARATUS OR DEVICES FOR LOCATING METAL IS PROHIBITED FOR ANY PURPOSE UPON OR WITHIN THE BOUNDARIES OF THE PARK.

DIVING OR JUMPING FROM ANY BRIDGE.

POSSESSING OR OPERATING A MOTORIZED VEHICLE UPON ANY UTILITY RIGHT-OF-WAY, EXCEPT WITH WRITTEN PERMISSION.

OPERATING ANY MOTOR VEHICLE WITHIN THE GREAT TRINITY FOREST IN VIOLATION OF TEXAS STATE TRAFFIC CODE.

OPERATING OR POSSESSING A MOTORIZED VEHICLE ON A GREAT TRINITY FOREST ROAD THAT IS CLOSED TO TRAFFIC BY MEANS OF A GATE, SIGN, OR OTHERWISE BLOCKED BY MOUND OF DIRT OR OTHER PHYSICAL MEANS.

OPERATING A VEHICLE CARELESSLY, RECKLESSLY, OR WITHOUT REGARD FOR THE RIGHTS OR SAFETY OF OTHER PERSONS OR IN A MANNER OR AT A SPEED THAT WOULD ENDANGER OR BE LIKELY TO ENDANGER ANY PERSON OR PROPERTY.

TRAILS

POSSESSING OR USING A MOTORIZED VEHICLE ON ANY DESIGNATED HIKING TRAIL.

POSSESSING OR USING A BICYCLE, SADDLE, PACK, OR DRAFT ANIMAL ON ANY DESIGNATED “PEDESTRIAN ONLY” HIKING TRAIL.

SHORTCUTTING ON ANY DESIGNATED HIKING TRAIL, HORSE TRAIL, OR MULTI-USE TRAIL.

POSSESSING OR OPERATING A VEHICLE OFF-ROAD IN THE GREAT TRINITY FOREST.

OCCUPANCY/USE

CAMPING OR THE ESTABLISHMENT OF A CAMPSITE SHALL BE LIMITED TO A PERIOD OF TIME NOT TO EXCEED 14 DAYS IN ANY 30 DAY TIME PERIOD.

ENTERING OR USING A DEVELOPED RECREATION SITE OR PORTION THEREOF WHEN POSTED CLOSED.

CAMPING OUTSIDE OF A DESIGNATED CAMPSITE.

WHILE CAMPING, IT IS PROHIBITED TO OPERATE AN ELECTRICAL GENERATOR BETWEEN THE HOURS OF 10:00 P.M. AND 7:00 A.M., EXCEPT IN DESIGNATED AREAS.

OCCUPYING AN INDIVIDUAL CAMPSITE WITH MORE THAN 8 PERSONS AND/OR 2 TENTS, EXCEPT IN A DESIGNATED GROUP CAMPING AREA.

PARKING OR LEAVING A VEHICLE IN VIOLATION OF POSTED INSTRUCTIONS.

PARKING OR LEAVING A VEHICLE OUTSIDE A PARKING SPACE ASSIGNED TO ONE'S OWN CAMP SITE.

POSSESSING, PARKING, OR LEAVING MORE THAN TWO VEHICLES, EXCEPT MOTORCYCLES OR BICYCLES, PER CAMP SITE.

BEING PUBLICLY NUDE.

SWIMMING OR BEING IN THE WATER WITHIN 100 FEET OF A DESIGNATED BOAT RAMP, UNLESS LOADING OR UNLOADING A BOAT.

SWIMMING OR BEING IN A DESIGNATED SWIMMING AREA IS PERMITTED DURING DAYLIGHT HOURS ONLY.

POSSESSION OF A GLASS DRINKING CONTAINER IN A DESIGNATED SWIMMING AREA.

SWIMMING OUTSIDE OF A DESIGNATED SWIMMING AREA, LOCATED IN A DEVELOPED RECREATION AREA.

CAMPGROUND AND RECREATION AREAS

DISCHARGING A FIREARM, AIR RIFLE, OR GAS GUN.

POSSESSING OR OPERATING A BOAT WITHIN A DESIGNATED SWIMMING AREA.

POSSESSION OR OPERATION OF A BOAT, MOTORBOAT, PERSONAL WATERCRAFT IN VIOLATION OF FEDERAL, STATE OR LOCAL LAWS.

OPERATING ANY WATERCRAFT IN EXCESS OF A POSTED SPEED LIMIT.

BEING IN THE AREA BETWEEN 10:00 P.M. AND 6:00 A.M. EXCEPT A PERSON WHO IS CAMPING IN A DEVELOPED RECREATION AREA OR WHO IS VISITING A PERSON CAMPING.

FISHING IN DESIGNATED SWIMMING AREA.

HUNTING OR ACCOMPANYING A HUNTER DURING ANY HUNTING SEASON.

FISHING BY AID OF TROTLINE, JUG LINES, OR THROW LINES.

RIDING, HITCHING, TETHERING OR HOBBLING A HORSE OR OTHER SADDLE OR PACK ANIMAL IN VIOLATION OF POSTED INSTRUCTIONS.

POSSESSION OR CONSUMPTION OF ALCOHOLIC BEVERAGE IN VIOLATION OF STATE LAW.

POSSESSING AN OPEN CONTAINER AND OR CONSUMPTION OF A BEVERAGE, DEFINED AS AN ALCOHOLIC BEVERAGE BY STATE LAW, IS PROHIBITED IN DEVELOPED PARKING AREAS, BOAT RAMPS AND SWIMMING BEACHES.

The following persons are exempt from these Orders:

1. Persons with a permit specifically authorizing the otherwise prohibited act or omission

2. Any Federal, State, or local officer, or member of an organized rescue or fire fighting force in the performance of an official duty.

3. Persons using a non-motorized wheelchair as a necessary medical appliance.

Great Trinity Forest Management Plan

RECREATION

Forest Service Trail Accessibility Guidelines (FSTAG)

May 22, 2006

Forest Service Trail Accessibility Guidelines

FSTAG

Contents

USDA Forest Service
Trail Accessibility Guidelines

Executive Summary

The Forest Service Trail Accessibility Guidelines (FSTAG) provide guidance for maximizing accessibility of trails in the National Forest System, while recognizing and protecting the unique characteristics of their natural setting. The FSTAG applies only to trails in the National Forest System that (1) are new or altered; (2) have a designed use of hiker/pedestrian under the Interagency Trail Data Standards (ITDS) and Forest Service Trail Planning and Management Fundamentals; and (3) connect directly to a currently accessible trail or a trailhead. Appropriate application of the FSTAG will ensure that the full range of trail opportunities continues to be provided, from primitive long-distance trails to highly developed trails and popular scenic overlooks. All Forest Service and ITDS trail classes will remain unchanged.

The FSTAG integrates the Forest Service policy of universal design (Forest Service Manual 2330.5) to ensure the integration of all people, to the greatest extent possible, without separate or segregated access for people with disabilities. Under the Forest Service's universal design policy, with few exceptions, all new or altered facilities and associated constructed features at recreation sites must comply with the technical provisions of the FSTAG, rather than only a certain percentage of those facilities.

The FSTAG is based on draft guidelines for outdoor developed areas created by a regulatory negotiation committee (Reg Neg Committee) established by the Architectural and Transportation Barriers Compliance Board (Access Board).

Like the Reg Neg Committee's draft guidelines, the FSTAG establishes one level of accessibility. The uniqueness of each trail is preserved through the use of conditions for departure and exceptions from the guidelines, when application of a technical provision would cause a change in a trail's setting or the purpose or function for which a trail was designed.

The FSTAG probably will not apply to most portions of existing primitive, long-distance trails. However, the FSTAG may apply to some segments of those trails, such as where they pass through a more developed area. The FSTAG contains exceptions that will prevent accessibility from being pointlessly applied in a piecemeal fashion along a trail when access between trail segments is not possible. The FSTAG also contains requirements to provide accessibility to special features where possible.

The Access Board is preparing to publish the Reg Neg Committee's draft guidelines for public notice and comment. The Access Board's guidelines will apply to federal agencies subject to the Architectural Barriers Act. When the Access Board finalizes its accessibility guidelines for outdoor developed areas, the Forest Service will revise the FSTAG to as needed to incorporate the Access Board's standards, where those

provisions are a higher standard, as supplemented by the Forest Service. The supplementation will ensure the agency's application of equivalent or higher guidelines and universal design, as well as consistent use of agency terminology and processes.

Preamble

The preamble provides background on the FSTAG, beginning with the Forest Service's development of universal design guidelines for outdoor recreation areas. The preamble also addresses applicability of the FSTAG, including a discussion of alteration versus maintenance, and provides a detailed explanation of the FSTAG's key provisions.

The FSTAG contains 11 technical provisions that apply to trails or trail segments in the National Forest System that (1) are new or altered (an alteration is a change in the original purpose, intent, or design of a trail); (2) have a designed use of hiker/pedestrian under the ITDS and Forest Service Trail Planning and Management Fundamentals; and (3) connect directly to an accessible trail or to a trailhead. For purposes of the FSTAG, a trailhead is a site designed and developed by the agency, a trail association, a trail maintaining club, trail partners, or other cooperators to provide staging for trail use. For purposes of the FSTAG the following do not constitute a trailhead: (1) junctions between trails where there is no other access and (2) intersections where a trail crosses a road or users have developed an access point, but no improvements have been provided by the Forest Service, a trail association, a trail maintaining club, trail partners, or other cooperators beyond minimal signage for public safety.

The FSTAG contains a definitions section and enumerates four conditions for departure and exceptions that provide for deviation from the technical provisions. Appendix A includes an overview of the FSTAG implementation process, which provides a graphic summary of the key FSTAG steps and process sequencing. Appendix B contains the ITDS trail classes. Appendix C contains the ITDS summary of trail designed use and managed use and the Forest Service Trail Planning and Management Fundamentals. Appendix D contains the technical provisions from the Forest Service Outdoor Recreation Accessibility Guidelines that are referenced in the FSTAG. Appendix E contains the provisions from the Architectural Barriers Act Accessibility Standards that are referenced in the FSTAG.

Background

The Architectural Barriers Act of 1968 (ABA) and Section 504 of the Rehabilitation Act of 1973 (Section 504) require newly constructed or altered facilities to be accessible, with few exceptions. The applicable standard for new construction and alteration of Forest Service facilities under these laws is the Architectural Barriers Act Accessibility Standards (ABAAS).

While Chapter 10 of the ABAAS addresses some recreation facilities, including boating and fishing facilities, swimming pools, play areas, sports arenas, miniature

golf courses, and amusement parks, the ABAAS does not address camping and picnicking areas and elements, outdoor recreation access routes, beach access routes, and pedestrian hiking trails.

Since the late 1980s, the USDA Forest Service (Forest Service) has been committed to the development of accessibility guidelines that protect the unique characteristics of the natural setting. In 1993, the Forest Service developed and implemented the *Universal Access to Outdoor Recreation: A Design Guide* (*Design Guide*), which contains accessibility guidelines for the outdoor recreation environment.

The applicability of the provisions in the *Design Guide* was based on the Forest Service's recreation opportunity spectrum (ROS). Under this approach, the degree of modification for accessibility in a given area reflects that area's level of development, resulting in a spectrum of opportunities for all people with the diversity of challenge and risk that is inherent in the outdoor recreation environment. The *Design Guide* also incorporated the universal design policy of developing programs and facilities to serve all people, to the greatest extent possible. The goal of universal design is to ensure integration of all people, without separate or segregated access for people with disabilities. Under the Forest Service's universal design policy, new or altered facilities and associated constructed features in recreation areas are required to be accessible, rather than only a certain percentage of those facilities, with few exceptions.

The Forest Service presented the *Design Guide* to the Access Board, the federal agency responsible for accessibility guidelines and for enforcement of the ABA. The Access Board established a Recreation Access Advisory Committee (RAAC) in July 1993 to develop additional recreation-oriented provisions for the federal accessibility guidelines. The RAAC issued a report in July 1994 that addressed the various types of recreation facilities and identified the features of each type that were not addressed by the current federal accessibility guidelines. The RAAC made recommendations for developing accessibility guidelines for those facilities.

The Access Board published an advance notice of proposed rulemaking in September 1994 requesting public comment on the RAAC's recommendations. The public comments expressed support for many of the recommendations. However, the public comments also revealed a lack of consensus among interested parties on some major issues regarding outdoor developed areas. Consequently, the Access Board decided to develop proposed accessibility guidelines for outdoor developed areas through a regulatory negotiation process. The Forest Service was one of the 24 members of the Regulatory Negotiation Committee on Outdoor Recreation Developed Areas (Reg Neg Committee).

The Reg Neg Committee's scope of work included outdoor recreation access routes, beach access routes, camping and picnicking areas and elements, and pedestrian hiking trails. The Reg Neg Committee determined that the applicability of its guidelines would not be based on the ROS. Rather, the Reg Neg Committee's guidelines would apply regardless of the setting, unless one or more conditions for departure existed and an exception applied for a specific technical provision. Further, the Reg Neg Committee's guidelines would not integrate a

universal design policy.

In 1999, the Reg Neg Committee issued draft accessibility guidelines for outdoor recreation facilities and trails. While awaiting completion of the rulemaking process for these guidelines, the Forest Service began developing internal guidelines for both trails and outdoor recreation facilities that would apply only in the National Forest System and that would comply with the public notice and comment process for Forest Service directives pursuant to 36 CFR Part 216. The agency took this step to provide a consistent and reliable method for designing accessible outdoor recreation facilities and trails pending promulgation of the Access Board's guidelines. The Forest Service's guidelines are based on the Reg Neg Committee's draft guidelines. The Forest Service's guidelines are in two parts: the Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG) and the Forest Service Trail Accessibility Guidelines (FSTAG).

In 2006, the Access Board plans to publish for public notice and comment the Reg Neg Committee's draft guidelines for outdoor developed areas managed by federal agencies. The Forest Service and the other federal land management agencies will work with the Access Board as it develops final accessibility guidelines for outdoor developed areas. The final FSTAG and FSORAG will incorporate the Access Board's standards, as supplemented by the Forest Service. The supplementation will ensure the agency's application of equivalent or higher guidelines and universal design, as well as consistent use of agency terminology and processes.

The FSTAG integrates the universal design policy contained in the *Design Guide*. For example, the FSTAG requires that signs be posted at the trailhead of new or altered trails and trail segments, as well as at the trailhead of trails that have been evaluated for accessibility, to provide information to all users concerning grade, width, and other characteristics that affect accessibility.

To deal specifically and in depth with trail-related issues, the Forest Service developed the FSTAG as a separate document from the FSORAG. The FSORAG addresses accessibility for campgrounds, picnic areas, outdoor recreation access routes, beach access routes, benches, trash, recycling, and essential containers, viewing areas at overlooks, telescopes and periscopes, mobility device storage, pit toilets in general forest areas, warming huts, and outdoor rinsing showers, and other constructed features associated with outdoor recreation areas. Both the FSTAG and the FSORAG are available at www.fs.fed.us/recreation/programs/accessibility**.**

The FSTAG integrates Forest Service trail terminology and policy. The Forest Service Trail Planning and Management Fundamentals, which mirror the ITDS, are available at the Forest Service Recreation Integrated Business Management website at www.fs.fed.us/r3/measures/TR.htm**.**

The FSTAG also references trail classes. A trail manager determines the applicable trail class by referring to the Forest Service and ITDS Trail Class Matrix that is included in Appendix B of the FSTAG and is posted on the agency's trails

website at
http://www.fs.fed.us/r3/measures/Inventory/trails%20files/Trail_Class_Matrix_1_31 2005.doc.

On February 17, 2005, the Forest Service published in the *Federal Register* for public notice and request for comments on the proposed directive to Forest Service Manual (FSM) 2350 that would require compliance with the FSTAG. On May 22, 2006, the Forest Service published, in the *Federal Register* (Volume 71, Number 98), notice of the final directive that requires compliance with the FSTAG, effective on that date. In the notice for the final directive, the agency also responded to the comments made on the proposed directive and noted the changes to the FSTAG made in response to comments.

The Forest Service will work closely with its many partners in implementing the FSTAG and FSORAG. The agency understands that some aspects of implementation may prove challenging, particularly with regard to expense, design expertise, and labor. The Forest Service is committed to assisting its partners in implementing the FSTAG and FSORAG.

Development of the FSTAG

The FSTAG was developed jointly by Forest Service trail and accessibility specialists to integrate with the Forest Service's trail program and the ITDS. The FSTAG was drafted by a committee of USDA employees consisting of Jaime Schmidt, the National Trail Information Manager; Ruth Doyle, Santa Fe National Forest Landscape Architect and Assistant Recreation Staff Officer, the Forest Service representative on the Reg Neg Committee, and the primary Forest Service author of the *Design Guide*; Peter Irvine, Trails Coordinator; Janet Zeller, the National Accessibility Program Manager; Jim Miller, the National Trails Program Manager; James Schwartz, National Trails Coordinator; Ellen Hornstein, Attorney Advisor, Office of the General Counsel, Natural Resources Division, and Gail van der Bie, Deputy Director of the Recreation and Heritage Resources Staff. The FSTAG was reviewed by the Forest Service Trails Development Team and the Regional Recreation Access Coordinators, as well as other agency employees and trail partners.

Purpose of the FSTAG

The purpose of the FSTAG is to provide guidance for maximizing accessibility, while protecting the unique characteristics of the natural setting. Specifically, the FSTAG:

- Protects forest resources and the environment.
- Preserves the recreation experience.
- Provides for equality of recreation opportunities.
- Maximizes accessibility.
- Is reasonable.
- Addresses public safety.
- Provides guidance.

- Is enforceable and measurable.
- Is based on independent use by persons with disabilities.
- Complies with the ABA, Section 504, and, to the greatest extent possible, current federal accessibility guidelines and standards.
- Integrates the Forest Service's universal design and trail policies.

Definitions

All trail-related definitions used in the FSTAG are from the ITDS and the Forest Service Trail Planning and Management Fundamentals.

Wheelchair Dimensions and Reach Ranges

The FSTAG bases standards for trail construction and alteration on wheelchair dimensions and reach ranges in the ABAAS.

SECTION-BY-SECTION ANALYSIS

SECTION 7.1 APPLICABILITY

The FSTAG applies only to trails in the National Forest System that are (1) new or altered; (2) have a designed use of hiker/pedestrian under the ITDS and Forest Service Trail Planning and Management Fundamentals; and (3) connect directly to an accessible trail or to a trailhead.

Alteration

An alteration is a change in the original purpose, intent, or design of a trail.

If a facility was constructed by a federal agency after 1968 or by any other entity after 1990, that facility had to be constructed in compliance with applicable accessibility standards that were in effect at the time of construction. If the facility is not accessible, when it is altered it must be brought into compliance with applicable accessibility requirements.

The Forest Service recognizes that not all the facilities it administers comply with this requirement. Since the early 1990s, the agency has been working hard to ensure that all new and altered facilities comply with applicable accessibility requirements. The agency also has developed transition plans to bring facilities that are not accessible into compliance.

Designed Use of Hiker/Pedestrian

A trail may be managed for multiple uses, such as cycling, horseback riding, and hiking. However, according to the ITDS and Forest Service Trail Planning and Management Fundamentals, each trail or trail segment has only one designed use (*i.e.,*.the managed use of a trail that requires the most demanding design, construction, and maintenance parameters). Since the FSTAG applies to construction and alteration of trails, rather than to management of trails, the

FSTAG applies to trails with a designed use, rather than a managed use, of hiker/pedestrian.

Connection to an Accessible Trail or to a Trailhead

The FSTAG takes into consideration a newly constructed or altered trail located in a remote area that connects to a trail that is not accessible. To address this concern, section 7.0 provides that the technical provisions apply only to new or altered trails and trail segments that connect directly to an accessible trail or to a trailhead. For purposes of the FSTAG, a trailhead is a site designed and developed by the Forest Service, a trail association, a trail maintaining club, a trail partner, or other cooperators to provide staging for trail use.

Maintenance

Trail maintenance is not subject to the FSTAG. Maintenance is routine or periodic repair of trails or trail segments to restore them to the standards to which they were originally designed and built. In contrast to alteration, maintenance does not change the original purpose, intent, or design of a trail.

Maintenance includes but is not limited to:

- Removal of debris and vegetation, such as downed trees or broken branches on a trail; clearing trail of encroaching brush or grasses; and removing rock slides.

- Maintenance of trail tread, such as filling ruts and entrenchments; reshaping a trail bed; repairing a trail surface and washouts; installing rip rap (rock placed to retain cut and fill slopes); and constructing retaining walls or cribbing to support trail tread.

- Erosion control and drainage; replacing or installing necessary drainage structures, such as drainage dips, water bars, or culverts; and realigning sections of trail to deter erosion or avoid boggy areas.

- Repair of trail or trailhead structures, including replacing deteriorated, damaged, or vandalized parts of structures, such as sections of bridges, boardwalks, information kiosks, fencing, and railings; painting; and removing graffiti.

Trail maintenance is completed in accordance with the standards established for each trail based on its trail management objectives. While accessible trails are likely to fall within a trail class that provides for more frequent maintenance, there may be times when a trail segment is not accessible due to normally occurring conditions in the outdoor environment, such as fallen branches. Routine maintenance of an accessible trail does not have to occur more frequently solely because the trail was constructed in compliance with the FSTAG.

While the FSTAG does not apply to trail maintenance, the Forest Service policy is to improve accessibility wherever possible. Trail designers and managers should take advantage of opportunities to improve accessibility in maintaining a trail that has a designed use of hiker/pedestrian.

The term “reconstruction” is not used in federal accessibility guidelines or the FSTAG, even though it is frequently used in the trails community. For the purposes of the FSTAG, actions are categorized as construction, alteration, or maintenance.

An Outdoor Recreation Access Route (ORAR) Versus a Trail

An ORAR is a continuous, unobstructed path designated for pedestrian use that connects elements at a recreation site such as a picnic area, campground area, or trailhead. In contrast, a trail is a route that is designed, constructed, or designated for recreational pedestrian use or provided as an pedestrian alternative to vehicular routes within a transportation system. Thus, a trail is not an ORAR and does not have to comply with the technical provisions for ORARs in section 2.0 of the FSORAG.

Associated Constructed Feature

In the FSTAG, the term “associated constructed feature” in relation to trails includes shelters, toilets, and other structures that provide support for trail users. To comply with the ABA and Section 504 requirement that new or altered facilities be accessible, the FSTAG requires associated constructed features to comply with the FSORAG.

These associated constructed features must be designed appropriately for the setting and in compliance with the FSTAG to ensure that the facility can be used for its primary purpose by all hikers, including hikers with disabilities. Illustrations of this principle follow.

- Pit toilet with no walls in a general forest area (GFA). The total height of the toilet seat and the riser it sits on must be 17 to 19 inches above the ground or floor. A clear floor or ground space complying with section 6.6.6 of the FSORAG must be provided adjacent to the riser. Since walls are not provided, grab bars are not required.

- Trail shelter or lean-to with three walls in a GFA. Where the constructed finished floor elevation is above the ground, the shelter or lean-to must be located so that at least one section of the floor on the open side of the shelter is 17 to 19 inches above the ground to facilitate transfer from a wheelchair.

- Bench. If a bench is provided along a trail, the bench must comply with section 6.1 of the FSORAG.

Specifications for tent pads and pit toilets constructed in GFAs are contained in

sections 5.2 and 6.6 of the FSORAG. For convenience, the FSORAG technical provisions cited in the FSTAG and the section-by-section analysis of each are included in Appendix D of the FSTAG.

In GFAs, the path connecting associated constructed features, as well as the path connecting them to a trail, must comply with section 7.0 of the FSTAG. These paths are not ORARs and are not required to meet the technical provisions for an ORAR in the FSORAG.

Wheelchair Access

A wheelchair or mobility device, including one that is battery-powered, is a device that is designed solely for use by a mobility-impaired person for locomotion and that is suitable for use in an indoor pedestrian area (Title V, sec. 507c, of the ADA; 36 CFR 212.1). "Designed solely for use by a mobility-impaired person for locomotion" means that the wheelchair was designed and manufactured solely for use for mobility by a person with a disability. Thus, this term does not include a motorized unit that has been retrofitted to make it usable by a person with a disability. "Suitable for use in an indoor pedestrian area" means usable inside a home, mall, courthouse, or other indoor pedestrian area.

A disabled person who requires use of a wheelchair or mobility device may use a wheelchair or mobility device that meets the definition in the preceding paragraph anywhere foot travel is permitted (FSM 2353.05 and Title V, sec. 507c, of the ADA). Wheelchairs and mobility devices are not defined as motor vehicles under Forest Service regulations (36 CFR 212.1). A motor vehicle cannot be used on National Forest System trails that are designated only for non-motorized use.

While the FSTAG does not require widening or flattening of primitive trails that would change their setting or purpose, in the coming years wheelchairs and other assistive medical technology will continue to change. It is likely that wheelchairs that meet the definition in the agency's regulations will be able to travel across narrow, steep terrain and not be dependent on firm and stable surfaces or electrical plug-in recharging. Individuals with disabilities utilizing these devices will access primitive areas and will expect to be able to use the toilet that has been constructed at that location. Even now, using the current technology of non-motorized wheelchairs and crutches, individuals with limited mobility are choosing to hike to mountain summits via non-accessible trails. These hikers are also utilizing the accessible toilets and shelters along those trails. Accordingly, under the Forest Service's accessibility guidelines, the door of a toilet structure must be at least 32 inches wide when opened fully, and its interior must meet minimum specifications.

Wheelchair Access to Non-Motorized Trails

Nothing in these guidelines permits the use of a motor vehicle on a National Forest System trail that is not designated for motor vehicle use. To prevent motor use on non-motorized trails, gates, rocks, berms, posts, or other restrictive devices may be placed at a trailhead. However, under Section 504, an individual may not be

denied participation in a federal program that is open to all other people. Thus, when foot travel is encouraged beyond a restrictive device, as it is at a trailhead, at least 32 inches of clear passage must be provided around or through the device to ensure that a person who uses a wheelchair can use the trail beyond the restriction. A 32-inch minimum width has been deemed sufficient because it is the minimum width required for a door under the ABAAS. Where foot travel is not encouraged but is permitted beyond a restrictive device, if a disabled individual expresses a need to access the area beyond the restrictive device, the administrative unit must work with that individual to provide access around the restriction. If a trail beyond a restrictive device does not meet the criteria for the FSTAG to apply, there is no requirement to make that trail accessible simply because there is clear passage of 32 inches around or through the device.

Puncheon, Boardwalks, and Trail Bridges

Puncheon, boardwalks, and trail bridges are trail constructed features and part of the trail tread, since they must be constructed in accordance with the width and other features of the trail. Thus, if a segment of a trail designed for hiker/pedestrian use is subject to the FSTAG's technical provisions, the puncheon and bridges on that trail segment are also subject to the FSTAG's technical provisions.

On any trail actively managed for pedestrian snow use (*i.e*., for snow-shoeing or cross-country skiing), trail bridge widths must accommodate passage by the intended users. For example, if a trail is managed for cross-country skiing, the bridges must be wide enough to provide safe passage by the skiers.

Section 7.1.1 Conditions for Departure

Complying with the FSTAG will not always result in trails that are accessible to all persons with disabilities. Characteristics of the natural environment, such as terrain, soils, and hydrology, could prevent compliance with some of the FSTAG's technical provisions.

Allowing some deviation is essential, as the outdoor environment is very different from a constructed indoor environment. Factors that influence the ability to provide fully accessible facilities, such as soil, surrounding vegetation, hydrology, terrain, and surface characteristics, are fundamental to outdoor areas. Without deviations from the technical provisions, compliance could significantly and unacceptably alter the nature of the outdoor experience.

Deviations are permitted from certain technical provisions of the FSTAG where one or more of four conditions for departure exist and an exception applies. Section 7.1.1 does not provide a blanket exemption from the technical provisions. Rather, each technical provision must be examined to determine whether a condition for departure exists and an exception applies that would permit deviation from that provision.

Section 7.1.1 authorizes deviation from specific technical provisions due to the

presence of a site-specific condition. When that site-specific condition no longer exists, the technical provision reapplies. For example, if complying with the provision for clear tread width would cause substantial harm to a significant natural feature, a condition for departure and an exception apply that would permit deviation from the provision. Although a deviation from the clear tread width provision would be permitted where the trail passes that feature, the other technical provisions would still apply at that point. Once the trail passes that feature, the technical provision for clear tread width would reapply.

The following are the four conditions for departure that permit deviations from specific technical provisions where an exception applies.

1. Where compliance would cause substantial harm to cultural, historic, religious, or significant natural features or characteristics.

A significant natural feature may include a large rock, outcrop, tree, vegetation, or body of water that is regarded as distinctive or important locally, regionally, or nationally. Significant natural features also could include areas protected under federal or state laws, such as areas with threatened or endangered species or wetlands that could be threatened or destroyed by full compliance with the technical provisions, or areas where compliance would directly or indirectly substantially harm natural habitat or vegetation.

Significant cultural features include areas such as archaeological sites, sacred lands, burial grounds and cemeteries, and protected tribal sites. Significant historical features include properties listed or eligible for listing in the National Register of Historic Places or other places of recognized historic value. Significant religious features include sacred tribal sites and other properties held sacred by an organized religion.

If the significant feature would be directly or indirectly altered, destroyed, or otherwise negatively impacted by construction of the outdoor recreation facility or element in the process of providing accessibility, this condition for departure would apply.

When determining whether substantial harm would be incurred by the proposed change, consider only the additional impact of increasing the size, relocating the feature, or other change necessary to provide accessibility. This condition for departure does not apply where substantial impact will result from construction of non-accessible features and only a little more impact is due to construction directly related to accessibility.

For example, there may be concern about the number of wildflower plants being removed on cut and fill slopes for an accessible trail along the side of a hill, where the plants are an uncommon species for which the surrounding river drainage and a nearby town are named. The trail construction would destroy most of the flowers, as well as the meadow that provides their habitat. This condition for departure would not apply if 300 square feet must be disturbed to make way for a

non-accessible trail and only another 80 square feet must be removed to provide an accessible trail. The majority of the proposed damage to the wildflowers is not attributable to compliance with accessibility requirements. In this case, an alternate location should be selected for the trail.

2. Where compliance would substantially change the physical or recreation setting or the trail class, designed use, or managed uses of the trail or trail segment or would not be consistent with the applicable land management plan.

Examples include a trail intended to provide a rugged experience, such as a cross-country training trail with a steep grade or a challenge course with abrupt and severe changes in level. If these types of trails were flattened out or otherwise constructed to comply with the technical provisions for accessible trails, they would not provide the desired level of challenge to users. Trails that traverse boulders and rock outcroppings are another example. The purpose of such a trail is to provide people with the opportunity to climb the rocks. To remove the obstacles along the way or reroute the trail around the rocks would destroy the purpose of the trail. The nature of the setting may also be compromised by actions such as widening for placement of an imported surface on a trail in a remote location or removing ground vegetation in meadows or alpine areas.

Compliance with the technical provisions of the FSTAG should not change the nature of the recreation opportunities provided. Further, compliance with the FSTAG should not negatively impact the unique characteristics of the natural setting, which prompt people to recreate in the outdoor rather than the indoor environment. People using primitive trails, for example, often experience the outdoor environment in a more natural state, with limited or no development. Evidence of manufactured building materials or engineered construction techniques in such a setting can change its primitive character and therefore the user's experience. In these settings, people are generally looking for a higher degree of challenge and risk where they can use their outdoor and survival skills. The Forest Service's firm position is that the fundamental, primitive character of trails designed as simple footpaths must not be compromised

Compliance with the FSTAG's technical provisions, particularly those related to surface and obstacles, could destroy the natural or undeveloped nature of the setting. This condition for departure addresses these concerns.

3. Where compliance would require construction methods or materials that are prohibited by federal, state, or local law.

For example, use of mechanized equipment is prohibited in wilderness areas. Construction methods are limited to hand tools in those areas. Imported materials may be prohibited to maintain the integrity of the natural setting. Construction methods and materials employed in wetlands or coastal areas are strictly limited. For traditional, historic, or other reasons, many trails are built using only native soil for surfacing, which may not be firm and stable. Federal statutes such as the Wilderness Act and the Endangered Species Act and state and local laws often impose restrictions to address environmental concerns. Many aquatic features are

protected under federal or state laws. Some constructed water crossings that are required to provide accessibility may not be permitted under certain laws or regulations.

Local law has been included in this condition for departure to address situations where conservation easements or local ordinances prohibit or restrict construction methods and practices. For example, where land is purchased from farms, certain use restrictions may prohibit importation of surfacing materials.

4. Where compliance would be impractical due to terrain or prevailing construction practices.

Complying with the technical provisions, particularly those governing trail grade in section 7.3.1, in areas of steep terrain may require extensive cuts or fills that would be difficult to construct and maintain or that would cause drainage and erosion problems. Furthermore, constructing a trail on steep slopes may make it significantly longer, causing a much greater impact on the environment. Certain soils are highly susceptible to erosion. Other soils expand and contract in accordance with their water content. If compliance requires techniques that are incompatible with the natural drainage or existing soil, the trail will be difficult, if not impossible, to maintain.

This condition for departure may also apply where an obstacle or construction methods for particularly difficult terrain require the use of equipment other than that typically used throughout the length of the trail. One example is requiring the use of a bulldozer to remove a rock outcropping when hand tools are commonly used. Several of these conditions for departure are consistent with similar exceptions in the Reg Neg Committee's draft guidelines.

Compliance with the provision for a surface that is both firm and stable (section 7.3.3) might conflict with prevailing construction practices by requiring importation of surfacing material that would not otherwise have been used. For example, if prevailing construction practices do not involve importation of surfacing material and the natural surfacing material cannot be made firm and stable, it may be impossible to comply with section 7.3.3.

The phrase "would be impractical" in this condition for departure refers to what is not reasonable, rather than to what is technically infeasible. This condition for departure applies when the effort and resources required to comply would be disproportionately high relative to the level of access established. Although compliance is technically possible, the amount of effort and resources required is not reasonable. For example, it may be possible to provide a trail with a 1:20 grade (5%) or less up a 1,500-foot mountain using heavy construction equipment, but the trail would be at least 5.8 miles long (rather than 2 miles long under a traditional backcountry layout), which could cause unacceptable environmental and visual impacts.

Trail construction practices vary greatly, from the use of volunteer labor and hand tools to professional construction with heavy, mechanized equipment. For trail

alteration, “prevailing construction practices” means the methods typically used for construction of the trail. For new trails, the land manager determines the construction practices to be used on each trail. However, the choice of construction practices is primarily determined by available resources, such as machinery, skilled operators, and environmental conditions (*e.g.,* soil type and depth, vegetation, and natural slope).

The intent of this condition for departure is to ensure that compliance with the technical provisions of the FSTAG does not require the use of construction practices that are beyond the skills and resources of the organization building the trail. This condition for departure is not intended to exempt the organization building the trail from the technical provisions of the FSTAG simply because of a particular construction practice (*e.g.,* the use of hand tools) or to encourage the use of a certain construction practice to avoid compliance when more expedient methods and resources are available.

Moreover, when the Forest Service is funding a project, the agency cannot use cost as the reason for not making the project accessible, unless the cost to make that project accessible would have a significant adverse impact on the agency’s appropriations.

Regardless of the amount of money that is available to the agency, consistent with the principles of the FSTAG, the natural setting should not be changed to make a trail or other area accessible. Thus, there is no requirement to use drastic measures to provide accessibility if doing so would unacceptably change the character of the setting and the recreation opportunity.

While the FSTAG addresses the special circumstances where trail designers and managers may not be able to achieve accessibility, they are always encouraged to provide access to the greatest extent possible.

Section 7.1.2 GENERAL EXCEPTIONS

A combination of factors may make it impractical to make an entire portion of a trail accessible according to the technical provisions of the FSTAG. As discussed under section 7.1.1, deviations from specific provisions are permitted where one or more conditions for departure exist and an exception applies. Once the conditions for departure no longer exist, the technical provisions must be met.

Given terrain and other environmental factors, only scattered portions of a trail or trail segment may meet all the technical provisions. Trail managers need to be able to determine whether the intent and objectives of an accessible hiking opportunity are being met on that trail. Section 7.1.2 includes two general exceptions to assist trail managers in making this determination.

Section 7.1.2.1 General Exception 1

The first general exception addresses situations where extreme, but not uncommon, environmental factors may be present along a trail that could render

compliance with the technical provisions impractical. These factors, listed below, are associated with trail grade, surface, tread width, and tread obstacles.

Specifically, the first general exception provides that where one or more conditions for departure in section 7.1.1 and at least one limiting factor exist, then only that segment of trail between the trail terminus and the first limiting factor must comply with section 7.3, if that segment is more than 500 feet long. If the segment of trail between the trail terminus and first limiting factor is 500 feet or less in length, section 7.3 does not apply. However, if a prominent feature is located between the trail terminus and first limiting factor and is 500 feet or less from the trail terminus, section 7.3 applies up to the prominent feature.

The limiting factors are:

(a) The combination of trail grade and cross slope exceeds 20% for over 40 feet (6100 mm).

(b) The surface is not firm and stable for a distance of 45 feet or more**.**

(c) The minimum tread width is 18 inches or less for a distance of at least 20 feet**.**

(d) A trail obstacle of at least 30 inches (770 mm) in height extends across the full width of the trail.

The rationale for this general exception is that certain natural conditions or limiting factors can present extreme environmental barriers to many people with disabilities, making independent access across or beyond that point on the trail very difficult or impossible. Further, it may not be possible to remove or otherwise design around these limiting factors because one or more conditions for departure exist. Independent access is one of the driving principles of the FSTAG, as well as the work of the Reg Neg Committee.

To incorporate accessibility where it would have the most impact, be feasible, and provide a meaningful hiking opportunity, the Forest Service and the Reg Neg Committee determined that the distance between the trail terminus and the limiting factor had to be over 500 feet for section 7.3 to apply. If the segment between the trail terminus and limiting factor were 500 feet or less in length, section 7.3 would not apply.

However, to maximize accessible hiking opportunities, if a prominent feature is located between the trail terminus and limiting factor and is less than 500 feet from the trail terminus, section 7.3 would apply up to the prominent feature. Even if a prominent feature is close to the trail terminus, being able to experience the prominent feature would provide a meaningful, albeit short, accessible hiking opportunity.

A prominent feature is a natural, cultural, or historic feature located along or adjacent to a trail that is determined by the trail designer or manager to have

national, regional, or local distinction or significance. It may be the focal point, main attraction, or destination of the trail or it may simply be an interesting secondary feature. Examples include but are not limited to boulder outcrops, waterfalls, groupings of old or unique trees or other vegetation, vistas that may not be part of a developed overlook, and cultural or historic structures.

Section 7.1.2.2 General Exception 2

The second general exception provides that where one or more conditions for departure exist that result in deviations from the technical provisions for over 15% of the length of a trail, section 7.3 applies only to the trail segment between the trail terminus and the first point of deviation, if that segment is more than 500 feet long. If the trail segment between the trail terminus and first point of deviation is 500 feet or less in length, section 7.3 does not apply to the trail. However, if a prominent feature is located between the trail terminus and first point of deviation and is 500 feet or less from the trail terminus, section 7.3 applies up to the prominent feature.

Under this exception, the 15% figure is calculated by adding up the length of trail impacted by each deviation. For example, a new 1-mile trail is being designed, and the slope provision cannot be met because conditions for departure apply in different sections of the trail for a total length of 400 feet. Likewise, the width provision cannot be met for a total of 250 feet. The trail manager keeps a running tally of the length of all deviations. Once the total deviations equal 792 feet (15% of 1 mile), section 7.3 applies only to the segment between the trail terminus and the first point of deviation, if that segment is more than 500 feet long. If the segment is 500 feet or less in length, section 7.3 does not apply to that segment unless there is a prominent feature between the trail terminus and first point of deviation.

For long-distance trails, such as National Forest System trails that span multiple districts or Forests, the Continental Divide National Scenic Trail, the Appalachian Trail, and the North Country Trail, the second general exception applies to the trail segments that are planned for construction or alteration within a given planning period, rather than over the entire length of the trail. Multiple segments that are not connected but are covered by the same planning process should be treated separately. Planning periods will vary considerably, as will the length of segments, based on the situations and entities involved. For example, if a trail manager or association typically plans trail work over 2 to 5 years, the second general exception applies to the total number of miles of trail that are constructed or altered during that period.

Section 7.1.3 Documentation

Often when trail managers leave their positions, they take with them the institutional knowledge and memory for a particular project. Therefore, documentation is being required for any construction or alteration of a trail that is designed for hiker/pedestrian use if a decision is made not to make the trail accessible.

If a determination is made that the FSTAG does not apply to an entire trail or cannot be met on portions of a trail, a brief document must be drafted and retained in the project file enumerating the rationale for that determination, which conditions for departure and exceptions apply, the date of the determination, and the name of the individuals who made the determination.

There is no standard format for this documentation; each unit may develop its own format to meet its specific needs. The documentation need not be lengthy; one page should be sufficient. The documentation will show that applicability of the FSTAG was considered at the onset of the project and that a good-faith effort was made to consider accessibility.

7.3 TECHNICAL PROVISIONS

Section 7.3.1 addresses both trail grade and cross slope. An exception permits deviation from the trail grade and cross slope provisions where one or more conditions for departure (section 7.1.1) exist.

Section 7.3.1.1 requires that trails comply with one or more of four separate provisions for trail grade: up to 1:20 (5%), up to 1:12 (8.33%), up to 1:10 (10%), and up to 1:8 (12%). Resting intervals of specified length are required when trail grades exceed 1:20 (5%). No more than 30% of the total trail length may exceed a trail grade of 1:12 (8.33%).

In addition, section 7.3.1.1 addresses the trail grade of drain dips. .To ensure proper drainage, a trail grade of up to 1:7 (14%) is permitted into and out of a drain dip where the cross slope does not exceed 1:20 (5%).

Because the terrain in outdoor environments is often steep, applying current slope and ramp requirements in the ABAAS is not reasonable. The Reg Neg Committee's draft guidelines and the FSTAG differ from the ABAAS in that handrails are not required on trails. Handrails are impractical in the outdoor environment. In addition, steeper grades on trails are usually contiguous with the surrounding terrain, rather than elevated above it, as is a ramp to a building. Instead, in the Reg Neg Committee's draft guidelines and the FSTAG, the length of steep trail segments has been limited, and resting intervals are required. The trail grades and maximum distances in the Reg Neg Committee's draft guidelines and the FSTAG strike a balance between accessibility and the constraints imposed by natural topography.

Section 7.3.1.2 requires that the cross slope of trail segments not exceed 1:20 (5%). Cross slope, or the side-to-side slope of a trail, can be difficult to traverse. At the same time, trails need to be designed to provide sufficient drainage to prevent accumulation of water and water damage to a trail. Non-paved surfaces generally require a steeper cross slope than paved surfaces

Section 7.3.1.2.1 addresses drain dips, permitting a cross slope of 1:10 (10%) at the bottom of the drain dip where the clear tread width is at least 42 inches.

Section 7.3.2 requires resting intervals to be 60 inches long to accommodate a

person using a wheelchair and at least as wide as the widest portion of the trail segment leading to the resting intervals. The slope of resting intervals may not exceed 1:20 (5%) in any direction. An exception permits deviation from this technical provision where one or more conditions for departure (section 7.1.1) exist.

Section 7.3.3 requires the surface of accessible trails to be both firm and stable. The FSTAG does not contain the slip resistance requirement in the accessible surface provisions in 302.1 of the ABAAS because slip resistance cannot be guaranteed in the outdoor environment. Weather conditions (rain, snow, and ice) affect slip resistance. For example, natural or non-hardened surfaces may not be slip resistant. Slip resistance also may be difficult to control when leaves and other surface debris caused by natural erosion accumulate on a surface.

The means and materials used to establish accessible exterior surfaces are plentiful. Crushed stone, fines, packed soil, and other natural materials can provide a firm and stable surface. Natural materials bonded with synthetic materials can provide the required degree of stability and firmness. However, not all of these materials are suitable for every trail. An exception permits deviation from this provision where one or more conditions for departure in section 7.1.1 exist. For example, as stated in the fourth condition for departure, if prevailing construction practices do not involve importation of surfacing material and the natural surfacing material cannot be made firm and stable, compliance with the firm and stable requirement may not be possible.

The terms “firm” and “stable” have been used in accessibility guidelines since the UFAS was issued in 1984. The terms have never been clearly defined, nor has there been a readily available means of technical measurement to determine what constitutes a firm and a stable surface. In the FSTAG, a firm surface is not noticeably distorted or compressed by the passage of a device that simulates a person using a wheelchair. Surface firmness should be determined and documented during the planning process for the primary seasons for which a trail is managed, under normally occurring weather conditions. In the FSTAG, a stable surface is not permanently affected by normally occurring weather conditions and is able to sustain normal wear and tear from the uses for which it is managed, between planned maintenance cycles. The determination of firmness and stability needs to be made keeping in mind the typical conditions that occur in the vicinity of the trail being evaluated. Local trail managers know the surface of trails they manage and how it wears throughout the primary seasons for which the trails are managed.

The purpose of ensuring the surface firmness and stability is to prevent mobility devices from sinking into the surface, thereby making it difficult for a person using crutches, a cane, or a wheelchair to move through that area with reasonable effort. The standard mobility device used in the Forest Service’s accessibility guidelines is the wheelchair because its dimensions and multiple contacts points (two wheels and two casters) often make it difficult to accommodate. Thus, if a person using a wheelchair can utilize an area, most other people also can utilize that area.

To determine the wheelchair compatibility of a surface, that is, whether it is firm and stable enough to accommodate a person using a wheelchair, one should look at the surface and consider whether (1) a person riding a narrow-tired bicycle could cross the surface easily without the wheels sinking into or disturbing the surface; and (2) whether a heavy child in a folding umbrella stroller with small plastic wheels could be pushed across the surface without the small wheels sinking into or distorting the surface. The wheel configurations on these two devices are similar to the large rear tires and small front casters of the average wheelchair. While this method for determining firmness and stability is not scientifically accurate, it has been proven to be effective.

In the late 1990s, Beneficial Designs of Minden, Nevada conducted a study under a contract for the Access Board. The purpose of the study was to determine the amount of energy required to negotiate different surface types and to develop recommendations for surface accessibility guidelines. The technical paper resulting from that work is available on the Access Board's website at www.access-board.gov/research&training/research.htm. For further information, consult Beneficial Designs' website at http://www.beneficialdesigns.com/.

Section 7.3.4 requires the clear tread width to be at least 36 inches. The clear tread is the width of the usable trail tread, measured perpendicular to the direction of travel and on or parallel to the surface of the usable trail tread.

This provision is consistent with the clear tread width requirements for an accessible route in 403.5.1 of the ABAAS.

Exception 1 permits the clear tread width to be reduced to no less than 32 inches where one or more of the conditions for departure in section 7.1.1 exist.

Exception 2 permits deviation from section 7.3.4 where a 32-inch minimum clear tread width cannot be provided because one or more conditions for departure in section 7.1.1 exist.

Section 7.3.5 requires passing space where the clear tread width of the trail is less than 60 inches. Passing space is required at intervals of no more than 1000 feet. Either a T-shaped space or a turning circle is permitted. An exception permits deviation from this provision where passing space cannot be provided because one or more conditions for departure in section 7.1.1 exist.

Section 7.3.6 requires that tread obstacles not exceed 2 inches in height.

Exception 1 permits a 3-inch obstacle where the trail grade and cross slope are 1:20 (5%) or less.

Exception 2 permits deviation from this provision if one or more conditions for departure in section 7.1.1 exist. Natural features such as rocks, roots, and ruts might require a greater obstacle height than what is permitted in the indoor environment. Some wheelchairs used in the outdoor environment are designed to handle obstacles at these heights.

Section 7.3.7 addresses protruding objects. Protruding objects extend into the clear tread width of a trail from beside or above it. Leaning tree trunks, rock ledges, and branches are common protruding objects. Trails must comply with 307 of the ABAAS and provide at least 80 inches of headroom. Where the vertical clearance of a trail is reduced to less than 80 inches because one or more conditions for departure in section 7.1.1 exist, a barrier to warn blind and visually impaired persons must be provided. An exception to these requirements is allowed where a condition for departure prevents providing 80 inches of clearance and installation of a warning barrier. This exception allows a trail to pass under ledges or through caves without changing the character of the area.

Section 7.3.8 requires openings in trail surfaces to be of a size that does not permit passage of a 1/2-inch-diameter sphere. Elongated openings must be placed so that the long dimension is perpendicular or diagonal to the dominant direction of travel.

Exception 1 allows elongated openings to be parallel to the dominant direction of travel where the opening does not permit passage of a 1/4-inch-diameter sphere. This exception is necessary to allow trail managers to place boards lengthwise along a boardwalk trail to reduce environmental impact, as is often done in a wetland area.

Exception 2 allows openings that do not permit passage of a 3/4-inch-diameter sphere where one or more conditions for departure in section 7.1.1 exist. Three-quarter-inch spacing is permitted under this exception since wooden plank decking or boardwalks are installed on many trails for crossing wet, sandy, rocky, or environmentally sensitive areas. The planks expand and contract because of weather conditions. The boardwalks may need more than 1/2-inch spacing between the planks to permit expansion and to allow water to drain.

Exception 3 permits deviation from this provision in its entirety where it is not feasible to provide openings that do not permit passage of a 3/4-inch-diameter sphere because one or more conditions for departure in section 7.1.1 exist.

Section 7.3.9 requires the height of edge protection, where provided, to be at least 3 inches. Natural trail surfaces are likely to vary. The 2-inch edge protection required by the ABAAS may not be obvious or detectable in the outdoor environment and may become a tripping hazard. In the outdoor environment, many people with limited vision who use canes will search higher than in an indoor environment to distinguish between the edge and the surface of the trail. Further, many people will use the natural tactile change between the trail surface and the surrounding ground surface to distinguish between the edge and the surface of the trail.

This provision specifies only the minimum height, not the design, of optional edge protection. If a decision is made to provide edge protection, it should be designed appropriately for the site. The use of holes, slots, or other openings in the edge protection for drainage or other reasons is entirely at the discretion of the designer.

In contrast to the edge protection requirement for ramps in the ABAAS, edge protection is not required under the FSTAG for accessible trails. However, where edge protection is provided for other reasons, such as to improve safety, it must comply with section 7.3.9.

Section 7.3.10 requires that signs be posted at the trailhead of new or altered trails and trail segments that fall into Trail Class 4 or 5 under the ITDS and the Forest Service's trail class matrix, as well as at the trailhead of trails that have been evaluated for accessibility. At a minimum, in addition to the standard information including the name and length of the trail, these signs must include the typical and maximum trail grade, typical and maximum cross slope, typical and minimum tread width, surface type and firmness, and obstacles.

Even if the FSTAG's technical provisions were met when a trail was constructed, events may occur, such as tree blow-downs and flooding, that may make the trail temporarily inaccessible until maintenance crews can clear the obstruction. To address these situations, signs posted at trailheads should state that the information they contain reflects the condition of the trail when it was constructed or assessed and should include the date of the construction or assessment.

Where more extensive trail information is provided (*e.g.*, an aerial map of the trail and related facilities), the location of specific trail features and obstacles that do not comply with the FSTAG's technical provisions should be identified and a profile of the trail grade should be included.

Local managers have the discretion to decide whether to post signs on new or altered trails and trail segments that fall into Trail Class 1, 2, or 3 under the ITDS or the Forest Service's trail class matrix. If a local manager decides to post signs on these trails, the signs must comply with section 7.3.10.

If materials need to be obtained from or manipulated on a sign or kiosk, the sign or kiosk must be designed to meet the reach ranges enumerated in 308 of the ABAAS.

Forest Service Trail Accessibility Guidelines

Scoping Requirements, Technical Provisions, and Appendices

Appendices

Technical Provisions

7.0 GENERAL

The provisions of section 7 apply to trails in the National Forest System that (1) are new or altered; (2) have a designed use of hiker/pedestrian under the Forest Service Trail Planning and Management Fundamentals and Interagency Trail Data Standards (ITDS); and (3) connect directly to a currently accessible trail or to a trailhead. Where provided, associated constructed features (such as tent pads and fire rings) located along National Forest System trails shall comply with the Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG), as provided in Forest Service Manual (FSM) 2330.03, paragraph 4(f).

Side trails or other routes to associated constructed features shall be at the same level of development as the parent trail. These side trails and other routes are not outdoor recreation access routes. Therefore, they are subject only to section 7 of the FSTAG and do not have to comply with the technical provisions in section 2.0 of the FSORAG that apply to outdoor recreation access routes.

7.1 APPLICABILITY

7.1.1 Conditions for Departure. Deviations from the technical provisions in section 7 are permitted only where one or more of the following conditions for departure exist and an exception applies. If no exception applies, no deviation is allowed. Deviations must be determined provision by provision. Once the circumstances that justify the deviation are no longer present, the technical provision must be met.

Condition for Departure 1. Where compliance would cause substantial harm to cultural, historic, religious, or significant natural features or characteristics**.**

Condition for Departure 2. Where compliance would substantially change the physical or recreation setting or the trail class, designed use, or managed use of a trail or trail segment or would not be consistent with the applicable land management plan.

Condition for Departure 3. Where compliance would require construction methods or materials that are prohibited by federal, state, or local law.

Condition for Departure 4. Where compliance would be impractical due to terrain or prevailing construction practices.

7.1.2 General Exceptions. Deviations from all the technical provisions in section 7.3 are permitted where one or more conditions for departure exist and general exception 1 or 2 applies.

7.1.2.1 General Exception 1. Deviations from all the technical provisions in section 7.3 are permitted where one or more conditions for departure in section

7.1.1 and at least one of the following limiting factors exist:

Limiting Factor 1. The combination of trail grade and cross slope exceeds 20% for over 40 feet (6100 mm).

Limiting Factor 2. The surface is not firm and stable for a distance of 45 feet or more (13700 mm).

Limiting Factor 3. The minimum trail width is 18 inches (462 mm) or less for a distance of at least 20 feet (6100 mm)**.**

Limiting Factor 4. A trail obstacle of at least 30 inches (770 mm) in height extends across the full width of the trail.

The following determines the extent section 7.3 applies where one or more conditions for departure and at least one limiting factor exist:

(A) If the trail segment between the trail terminus and the limiting factor is more than 500 feet (150 m) in length, section 7.3 does not apply after the first limiting factor.

(B) If the trail segment between the trail terminus and the limiting factor is 500 feet (150 m) or less in length, section 7.3 does not apply to the trail, subject to the exception in paragraph (C).

(C) If a prominent feature is located between the trail terminus and the limiting factor, the segment between the trail terminus and the prominent feature must comply with section 7.3, even if the segment is 500 feet (150 m) or less in length.

7.1.2.2 General Exception 2. The following determines the extent section 7.3 applies where one or more conditions for departure exist that result in deviations from the technical provisions of section 7.3 for over 15% of the length of trail:

(A) If the trail segment between the trail terminus and the first point of deviation is more than 500 feet (150 m) in length, section 7.3 does not apply after the first point of deviation.

(B) If the trail segment between the trail terminus and the first point of deviation is 500 feet (150 m) or less in length, section 7.3 does not apply to the trail, subject to the exception in paragraph (C).

(C) If a prominent feature is located between the trail terminus and the first point of deviation, the segment between the trail terminus and the prominent feature must comply with section 7.3, even if the segment is 500 feet (150 m) or less in length.

For long-distance trails, General Exception 2 applies to the trail segments that are planned for construction or alteration in a given planning period, rather than over the entire length of the trail.

7.1.3 Documentation. If a determination is made that the FSTAG's technical provisions do not apply to an entire trail or cannot be met on portions of a trail, a brief document shall be drafted and retained in the project file enumerating the rationale for that determination, which conditions of departure and exceptions apply, the date of the determination, and the name of the individuals who made the determination. There is no standard format for this documentation; each unit may develop its own format to meet its specific needs.

7.2 DEFINITIONS

All trail-related definitions used in the FSTAG are from the Forest Service's Infrastructure Trails Module and the Trail Assessment and Condition Survey (TRACS) materials.

Accessible Trail. A trail that meets all the technical provisions in section 7.3 of the FSTAG. The technical provisions in section 7.3 of the FSTAG may be met to varying degrees, due to the presence of one or more conditions for departure. However, a trail or trail segment is not accessible if a condition for departure and an exception render a technical provision inapplicable.

Alteration. A change in the original purpose, intent or design of a trail.

Constructed Features

- **Associated Constructed Feature.** A constructed element associated with a trail that provides support for trail users, but is not a part of the trail tread. Examples include overnight shelters, toilets, fire rings, picnic tables, and tent pads. Refer to the FSORAG for the technical provisions for associated constructed features.

- **Trail Constructed Feature.** A constructed feature that functions as part of the trail tread. Examples include puncheon, trail bridges, boardwalks, waterbars, and switchbacks. For a listing of trail constructed features, refer to the trail documentation on the Forest Service website http://www.fs.fed.us/r3/measures/TR.htm.

Cross Slope. The percentage of rise to length when measuring the trail tread from edge to edge perpendicular to the direction of travel.

- **Typical Cross Slope.** The normally encountered cross slope found along the length of a trail. Measurement intervals become more frequent as the trail class increases.

Designed Use. The managed use of a trail that requires the most demanding design, construction, and maintenance parameters.

General Forest Areas (GFAs). For purposes of the FS guidelines, all National Forest System lands available for recreational use, other than wilderness areas, where the FS Recreation Site Development Scale is 2 or less. FS Development

Scale 0 recreation sites do not contain any constructed features, while constructed features in FS Development Scale 1 and 2 recreation sites are primarily for resource protection rather than visitor comfort and convenience.

Hiker/Pedestrian Trail. A trail that is designed, constructed, and maintained for hiker/pedestrian use or that is actively managed for hiker/pedestrian use.

Maintenance. Routine or periodic repair of trails or trail segments to restore them to the standards to which they were originally designed and built**.** Maintenance does not change the original purpose, intent, or design of a trail.

Managed Uses. The modes of travel for which a trail is actively managed.

Outdoor Recreation Access Route (ORAR). A continuous, unobstructed path for pedestrian use that connects elements in a picnic area, in a campround, or at a trailhead.

Point of Deviation. The location on a trail where one or more technical provisions in the FSTAG cannot be met due to the presence of a condition for departure enumerated in section 7.1.1.

Prominent Feature. A natural, cultural, or historic feature located along or adjacent to a trail that is determined by a trail designer or manager to have national, regional, or local distinction or significance. A prominent feature may be the focal point, main attraction, or destination of a trail, or it may simply be an interesting secondary feature. Examples include but are not limited to boulder outcrops, waterfalls, groupings of old or unique trees or other vegetation, vistas that may or may not be part of a developed overlook, and cultural or historic structures.

Protruding Object. An object, such as a tree, branch, or rock ledge, that extends into a trail from beside or above it.

Recreation Site. A discrete area on a Forest that provides recreation opportunities, receives use, and requires a management investment to operate and/or maintain to standard.

Scoping Requirement. Specification of where, when, and how much of a constructed feature must be accessible to comply with the FSTAG.

Surface

- **Firm.** Not noticeably distorted or compressed by the passage of a device that simulates a trail user in a wheelchair. Surface firmness should be determined and documented during the planning process for the seasons for which a trail is managed, under normally occurring weather conditions.

- **Stable.** Not permanently affected by normally occurring weather conditions and able to sustain normal wear and tear caused by the uses for which a trail is managed, between planned maintenance cycles.

Technical Provision. Specification of the dimensions and characteristics of constructed features that are required to ensure accessibility.

Trail. For purposes of the FSTAG and FSORAG, a trail is a route that is designed, constructed, or designated for recreational pedestrian use or provided as an pedestrian alternative to vehicular routes within a transportation system. A trail is not an outdoor recreation access route (ORAR).

Trail Class. The prescribed scale of trail development, indicating the intended design and management standards for a trail.

Trail Grade. The consistent vertical distance of ascent or descent of a trail expressed as a percentage of its length, commonly measured as a ratio of rise to length.

Trailhead. For purposes of the FSTAG, a site designed and developed by the Forest Service, a trail association, a trail maintaining club, a trail partner, or other cooperators to provide staging for trail use.

For purposes of the FSTAG the following do not constitute a trailhead:

- Junctions between trails where there is no other access.

- Intersections where a trail crosses a road or users have developed an access point, but no improvements have been provided by the Forest Service, a trail association, a trail maintaining club, a trail partner, or other cooperators beyond minimal signage for public safety.

Trail Segment. The portion of a trail being planned, evaluated, or constructed.

Trail Terminus. The beginning or ending point of a trail or trail segment, where a trail assessment or trail work begins or ends.

Tread Width. The visible trail surface measured perpendicular to the direction of travel.

- **Clear Tread Width.** The width of the usable trail tread and adjacent usable surface.

- **Minimum Tread Width.** The width of the usable part of the tread width at the narrowest point on a trail.

- **Minimum Trail Width.** The width of the trail tread and the adjacent usable surface at the narrowest point on a trail.

Wheelchair. A device, including one that is a battery-powered, that is designed solely for use by a mobility-impaired person for locomotion and that is suitable for use in an indoor pedestrian area. A person whose disability requires use of a wheelchair or mobility device may use a wheelchair or mobility device that meets this definition anywhere foot travel is permitted.

7.3 TECHNICAL PROVISIONS

7.3.1 Trail Grade and Cross Slope. Trail grades and cross slopes shall comply with sections 7.3.1.1 and 7.3.1.2.

> **Exception.** Section 7.3.1 does not apply where one or more conditions for departure in section 7.1.1 exist.

7.3.1.1 Trail Grade. The grade of trail segments shall comply with this section and shall be consistent over the distances cited. No more than 30% of the total trail length may exceed a trail grade of 1:12 (8.33%).

7.3.1.1.1. Trail grade of up to 1:20 (5%) is permitted for any distance.

7.3.1.1.2. Trail grade of up to 1:12 (8.33%) is permitted for up to 200 feet (61 m). Resting intervals complying with section 7.3.2 shall be provided at distances no greater than 200 feet (61 m) apart.

7.3.1.1.3. Trail grade of up to 1:10 (10%) is permitted for up to 30 feet (9150 mm). Resting intervals complying with section 7.3.2 shall be provided at distances no greater than 30 feet (9150 mm) apart.

7.3.1.1.4. Trail grade of up to 1:8 (12.5%) is permitted for up to 10 feet (3050 mm). Resting intervals complying with section 7.3.2 shall be provided at distances no greater than 10 feet (3050 mm) apart.

7.3.1.1.5. At drain dips, a trail grade of 1:7 (14%) is permitted for up to 5 feet (1525 mm) where the cross slope does not exceed 1:20 (5%).

7.3.1.2 Cross Slope. The cross slope shall not exceed 1:20 (5%).

7.3.1.2.1. At drain dips, a cross slope of up to 1:10 (10%) is permitted at the bottom of the dip where the clear tread width is at least 42 inches (1065 mm).

7.3.2 Resting Intervals. Where the trail grade exceeds 5%, resting intervals shall be provided as specified in sections 7.3.1.1.2, 7.3.1.1.3, and 7.3.1.1.4. Resting intervals shall be at least 60 inches (1525 mm) long, shall be at least as wide as the widest portion of the trail segment leading to the resting intervals, and shall have a slope not exceeding 1:20 (5%) in any direction.

> **Exception.** This provision does not apply where resting intervals cannot be provided because one or more conditions for departure in section 7.1.1 exist.

7.3.3 Surface. The trail tread surface shall be both firm and stable.

Exception. This provision does not apply where a firm and stable surface cannot be provided because one or more conditions for departure in section 7.1.1 exist.

7.3.4 Clear Tread Width. The clear tread width of the trail shall be at least 36 inches (915 mm).

Exception 1. The clear tread width may be reduced to no less than 32 inches (815 mm) where one or more conditions for departure in section 7.1.1 exist.

Exception 2. This provision does not apply where at least 32 inches (815 mm) clear tread width cannot be provided because one or more conditions for departure in section 7.1.1 exist.

7.3.5 Passing Spaces. Where the clear tread width of the trail is less than 60 inches (1525 mm), passing spaces shall be provided at intervals of no more than 1000 feet (300 m). Passing spaces shall be at least 60 by 60 inches (1525 mm), or an intersection of two walking surfaces that provide a T-shaped space complying with 304.3.2 of the Architectural Barriers Act Accessibility Standards (ABAAS), provided that the arms and stem of the T-shaped space extend at least 48 inches (1220 mm) beyond the intersection. The cross slope of passing spaces shall not exceed 5% in any direction.

Exception 1. This provision does not apply where passing spaces cannot be provided because one or more conditions for departure in section 7.1.1 exist.

7.3.6 Tread Obstacles. Where tread obstacles exist, they shall not exceed a height of 2 inches (50 mm).

Exception 1. Tread obstacles with a maximum height of 3 inches (75 mm) are permitted where trail grade and cross slope are 1:20 (5%) or less.

Exception 2. Where exception 1 cannot be met because one or more conditions for departure in section 7.1.1 exist, section 7.3.6 does not apply.

7.3.7 Protruding Objects. Protruding objects on trails shall comply with 307 of the ABAAS and shall have at least 80 inches (2030 mm) of headroom.

Exception 1. Where vertical clearance of a trail is reduced to less than 80 inches (2030 mm) because one or more conditions for departure in section 7.1.1 exist, a barrier shall be provided to warn individuals who are blind or visually impaired.

Exception 2. Where exception 1 cannot be met because one or more conditions for departure in section 7.1.1 preclude 80 inches of headroom or installation of a warning barrier, section 7.3.7 does not apply.

7.3.8 Openings. Openings in trail tread surfaces shall be small enough to prevent passage of a 1/2-inch (13 mm)-diameter sphere. Elongated openings shall be placed so that the long dimension is perpendicular or diagonal to the dominant direction of travel.

> **Exception 1.** Elongated openings are permitted to be parallel to the dominant direction of travel where the opening does not allow passage of a 1/4-inch (6.5 mm)-diameter sphere.
>
> **Exception 2.** Openings that are perpendicular or diagonal to the dominant direction of travel are permitted to be of a size that does not allow passage of a 3/4-inch (19 mm)-diameter sphere where one or more conditions for departure in section 7.1.1 exist.
>
> **Exception 3.** Where exception 1 or exception 2 cannot be met because one or more conditions for departure in section 7.1.1 exist, section 7.3.8 does not apply.

7.3.9 Edge Protection. Where edge protection is provided along a trail, the edge protection shall have a height of at least 3 inches (75 mm).

7.3.10 Signs. If materials need to be obtained from or manipulated on a sign or kiosk, the sign or kiosk shall be designed to meet the reach ranges in 308 of the ABAAS.

Signs shall be posted at the trailhead of new or altered trails and trail segments that fall into Trail Class 4 or 5, as well as at the trailhead of trails that have been evaluated for accessibility. At a minimum, in addition to the standard information including the name and length of the trail, these signs shall include the typical and maximum trail grade, typical and maximum cross slope, typical and minimum tread width, surface type and firmness, and obstacles. These signs also should state that the posted information reflects the condition of the trail when it was constructed or assessed and should include the date of the construction or assessment.

Where more extensive trail information is provided (*e.g.,* an aerial map of the trail and related facilities), the location of specific trail features and obstacles that do not comply with the FSTAG's technical provisions should be identified and a profile of the trail grade should be included. Local managers have the discretion to decide whether to post signs on newly constructed or altered trails that fall into Trail Class 1, 2, or 3.

APPENDIX A

Overview of the FSTAG Implementation Process

This provides a graphic summary of the FSTAG implementation process. The overview outlines FSTAG steps and process sequencing. The detailed information, definitions and technical provisions that are critical to understanding and implementing the complete FSTAG process are provided in the FSTAG preamble and technical provisions.

The FSTAG must be applied prior to initiating any project involving the new construction or alteration of any National Forest System trail with the designated of hiker/pedestrian.

Overview of Process

Assessment Pre-Work

Before applying the FSTAG, assessment pre-work includes but is not limited to:

1. Analysis of existing conditions, including potential opportunities and constraints (*e.g.,* NEPA analysis).
2. Identification/verification of the desired trail class for the trail or trail segment.
3. Identification/verification of the Designed Use of the trail or trail segment. [1]

↓

Key Steps and Sequence

Step 1: Determine Applicability of the FSTAG

Designed Use[1] = Hiker/Pedestrian? — No → FSTAG does not apply.

↓ Yes

New Construction or Alteration? — No → FSTAG does not apply.

↓ Yes

Trail Connects to a Trailhead or Accessible Trail? — No → FSTAG does not apply.

↓ Yes

Proceed to Step 2:
Identify Presence of Limiting Factors.

Step 2: Identify Presence of Limiting Factors

General Exception 1 (7.1.2.1)

Note: Sequence for identifying limiting factors may vary and does not need to occur in the order illustrated here.

Trail Grade Trail grade exceeds 20% for 40' or more?	No →							FSTAG may still apply. Proceed to limiting factor for surface.
	Yes → Document length of trail that exceeds 20% and data source.	Does condition for departure exist?	No →					
			Yes →	Is limiting factor more than 500' from trail terminus?	Yes →			FSTAG applies between terminus and this limiting factor or prominent feature.
					No →	Prominent feature present?	Yes →	
							No →	FSTAG does not apply. Document applicable condition for departure.
Surface Surface not firm and stable for 45' or more?	N o (The surface IS firm and stable) →							FSTAG may still apply. Proceed to limiting factor for minimum trail width.
	Yes (the surface is NOT firm and stable). → Document surface firmness and data source.	Does condition for departure exist?	No →					
			Yes →	Is limiting factor more than 500' from trail terminus?	Yes →			FSTAG applies between terminus and this limiting factor or prominent feature.
					No →	Prominent feature present?	Yes→	
							No→	FSTAG does not apply. Document applicable condition for departure.
Minimum Trail Width Minimum trail width less than 18" for 20' or more?	No→							FSTAG may still apply. Proceed to limiting factor for trail obstacle.
	Yes → Document minimum trail width and data source.	Does condition for departure exist?	No→					
			Yes →	Is limiting factor more than 500' from trail terminus?	Yes →			FSTAG applies between terminus and this limiting factor or prominent feature.
					No →	Prominent feature present?	Yes→	
							No→	FSTAG does not apply. Document applicable condition for departure.
Trail Obstacle Trail obstacle 30" or higher across width of trail?	No →							FSTAG may still apply. Proceed to Step 3: Apply Technical Provisions..
	Yes → Document obstacle type, dimensions and data source.	Does condition for departure exist?	No →					
			Yes →	Is limiting factor more than 500' from trail terminus?	Yes →			FSTAG applies between terminus and this limiting factor or prominent feature.
					No →	Prominent feature present?	Yes →	
							No →	FSTAG does not apply. Document applicable condition for departure.

Step 3: Apply Technical Provisions Technical Provisions (7.3.1 to 7.3.8)	**Trail Grade** Trail grade complies with 7.3.1.1?	Yes →				Comply with trail grade technical provision 7.3.1.1.	
		No →	Does condition for departure exist?	Yes →	Deviation permitted. Measure and record length of deviation.	→	Proceed to Step 4: calculate cumulative deviation percentage.
				No →	Deviation not permitted. →	Comply with trail grade technical provision 7.3.1.1.	
	Trail Cross Slope Trail cross slope complies with 7.3.1.2?	Yes →				Comply with trail cross slope technical provision 7.3.1.2.	
		No →	Does condition for departure exist?	Yes →	Deviation permitted.[2] Measure and record length of deviation.	→	Proceed to Step 4: calculate cumulative deviation percentage.
				No →	Deviation not permitted. →	Comply with trail cross slope technical provision 7.3.1.2.	
	Resting Interval Resting intervals comply with 7.3.2?	Yes →				Comply with resting interval technical provision 7.3.2.	
		No →	Does condition for departure exist?	Yes →	Deviation permitted. [2] Measure and record length of deviation.	→	Proceed to Step 4: calculate cumulative deviation percentage.
				No →	Deviation not permitted. →	Comply with resting interval technical provision 7.3.2.	
	Surface Surface complies with 7.3.3?	Yes →				Comply with surface technical provision 7.3.3.	
		No →	Does condition for departure exist?	Yes →	Deviation permitted. [2] Measure and record length of deviation.	→	Proceed to Step 4: calculate cumulative deviation percentage.
				No →	Deviation not permitted. →	Comply with surface technical provision 7.3.3.	
	Clear Tread Width Clear tread	Yes →				Comply with clear tread width technical provision 7.3.4.	
		No →	Does condition for departure	Yes →	Deviation permitted[2] Measure and record length of deviation.	→	Proceed to Step 4: calculate cumulative deviation percentage.

	width complies with 7.3.4?		exist?	No →	Deviation not permitted.	→	Comply with clear tread width technical provision 7.3.4.	
Passing Space Passing spaces comply with 7.3.5?	Yes →						Comply with passing space technical provision 7.3.5.	
	No →	Does condition for departure exist?	Yes →	Deviation permitted.[2] Measure and record length of deviation.		→	Proceed to Step 4: calculate cumulative deviation percentage.	
			No →	Deviation not permitted.	→		Comply with passing space technical provision 7.3.5.	
Tread Obstacles Tread obstacles comply with 7.3.6?	Yes →						Comply with tread obstacle technical provision 7.3.6.	
	No →	Does condition for departure exist?	Yes →	Deviation permitted.[2] Measure and record length of deviation.		→	Proceed to Step 4: calculate cumulative deviation percentage.	
			No →	Deviation not permitted.	→		Comply with tread obstacle technical provision 7.3.6.	
Protruding Objects Protruding objects comply with 7.3.7?	Yes →						Comply with protruding objects technical provision 7.3.7.	
	No →	Does condition for departure exist?	Yes →	Deviation permitted.[2] Measure and record length of deviation.		→	Proceed to Step 4: calculate cumulative deviation percentage.	
			No →	Deviation not permitted.	→		Comply with protruding objects technical provision 7.3.7.	
Openings Openings comply with 7.3.8?	Yes →						Comply with trail grade technical provision 7.3.8.	
	No →	Does condition for departure exist?	Yes →	Deviation permitted.[2] Measure and record length of deviation.		→	Proceed to Step 4: calculate cumulative deviation percentage.	
			No →	Deviation not permitted.	→		Comply with openings technical provision 7.3.8.	

<table>
<tr><td rowspan="5">Step 4: Calculate Cumulative Deviation Percentage

General Exception 2 (7.1.2.2)</td><td rowspan="5">Cumulative Deviation Percentage

Do permitted deviations occur on less than 15 percent of total trail length?</td><td colspan="4">Yes ➞</td><td>Apply FSTAG technical provisions to entire trail.[3]</td></tr>
<tr><td rowspan="4">No, deviations occur on more than 15%. ➞</td><td rowspan="4">Is first deviation located more than 500’ from trail terminus?</td><td colspan="3">Yes ➞</td><td>Apply FSTAG technical provisions to segment of trail between terminus and first point of deviation. [3]</td></tr>
<tr><td rowspan="3">No ➞</td><td rowspan="3">Does prominent feature exist?</td><td>Yes ➞</td><td>Apply FSTAG technical provisions to segment of trail between terminus and prominent feature. [3]</td></tr>
<tr><td rowspan="2">No ➞</td><td rowspan="2">FSTAG does not apply.

Document cumulative deviation percentage.</td></tr>
<tr></tr>
</table>

[1] Excerpt from *Forest Service Trail Fundamentals* (www.fs.fed.us/r3/measures/Inventory/Trails.htm)

Definition of Designed Use: “The intended use that controls the desired geometric design of the trail, and determines the subsequent maintenance parameters for the trail…. Of the actively Managed Uses that the trail is developed and managed for, the Designed Use is the single design driver that determines the technical specifications for the trail.”

Excerpt from Access Board *Recommendations for Accessibility Guidelines: Outdoor Developed Areas, Final Report* (page 11):

“The accessibility guidelines for trails apply to those which are designed and constructed for pedestrian use. These guidelines are not applicable to trails primarily designed and constructed for recreational use by equestrians, mountain bicyclists, snowmobile users, or off-highway vehicle users, even if pedestrians may occasionally use the same trails. People use these categories of trails by means of transportation other than foot travel or personal mobility device. Design and constructed requirements for equestrians, mountain bikes, OHVs, and snowmobiles are based on the specific requirements for the intended mode of transportation. For the safety of trail users, pedestrian use may not always be permitted on these trails in order to minimize conflicts between motorized and non-motorized recreation. These trails do not preclude use by a person with a disability since it is planned that all trail users would be using the one or more alternative means of transportation for which the trail is designed and constructed. The design and construction of pedestrian trails without consideration of these proposed guidelines, by contrast, could present barriers to some trail users because the intended use is by foot or personal mobility device. For these reasons, the committee intentionally limited the application of the proposed guidelines to pedestrian use trails.

It should be noted that the definition used in these proposed guidelines is not the only definition used by trail designers and manager. Rather, it was developed to specifically define the scope of these guidelines.

[2] If at any point during Step 3 the occurrence of one or more conditions of departure results in permitted deviations from technical provisions on more than 15% of the trail length, proceed to Step 4.

[3] Refer to the FSTAG for detailed instructions, definitions, and technical provisions 7.0 through 7.3.10.

APPENDIX B

TRAIL CLASS

National Trail Management Classes

Updated 1/14/2004

Trail prescriptions describe the desired management of each trail, based on Forest Plan direction. These prescriptions take into account user preferences, setting, protection of sensitive resources, and other management activities. To meet prescription, each trail is assigned an appropriate Trail Class. These general categories are used to identify applicable Trail Design Parameters and to identify basic indicators used for determining the cost to meet national quality standards.[1]

Note: Trail Class descriptions define "typical" attributes, and exceptions may occur for any attribute. Apply the Trail Class that most closely matches the managed objective of the trail.

Trail Attributes	Trail Class 1 Minimal/Undeveloped Trail	Trail Class 2 Simple/Minor Development Trail	Trail Class 3 Developed/Improved Trail	Trail Class 4 Highly Developed Trail	Trail Class 5 Fully Developed Trail
General Criteria Physical Characteristics to be Applied to All National Forest System Trails					
Tread & Traffic Flow	• Tread intermittent and often indistinct • May require route finding • Native materials only	• Tread discernible and continuous, but narrow and rough • Few or no allowances constructed for passing • Native materials	• Tread obvious and continuous • Width accommodates unhindered one-lane travel (occasional allowances constructed for passing) • Typically native materials	• Tread wide and reltively smooth with few irregularities • Width may consistently accommodate two-lane travel • Native or imported materials • May be hardened	• Width generally accommodates two-lane and two-directional travel, or provides frequent passing turnouts • Commonly hardened with asphalt or other imported material

Trail Attributes	Trail Class 1 Minimal/Undeveloped Trail	Trail Class 2 Simple/Minor Development Trail	Trail Class 3 Developed/Improved Trail	Trail Class 4 Highly Developed Trail	Trail Class 5 Fully Developed Trail
General Criteria Physical Characteristics to be Applied to All National Forest System Trails					
Obstacles	• Obstacles common • Narrow passages; brush, steep grades, rocks and logs present	• Obstacles occasionally present • Blockages cleared to define route and protect resources • Vegetation may encroach into trailway	• Obstacles infrequent • Vegetation cleared outside of trailway	• Few or no obstacles exist • Grades typically <12% • Vegetation cleared outside of trailway	• No obstacles • Grades typically <8%
Constructed Features & Trail Elements	• Minimal to non-existent • Drainage is functional • No constructed bridges or foot crossings	• Structures are of limited size, scale, and number • Drainage functional • Structures adequate to protect trail infrastructure and resources • Primitive foot crossings and fords	• Trail structures (walls, steps, drainage, raised trail) may be common and substantial • Trail bridges as needed for resource protection and appropriate access • Generally native materials used in Wilderness	• Structures frequent and substantial • Substantial trail bridges are appropriate at water crossings • Trailside amenities may be present	• Structures frequent or continuous; may include curbs, handrails, trailside amenities, and boardwalks • Drainage structures frequent; may include culverts and road-like designs
Signs	• Minimum required • Generally limited to regulation and resource protection • No destination signs present	• Minimum required for basic direction • Generally limited to regulation and resource protection • Typically very few or no destination signs present	• Regulation, resource protection, user reassurance • Directional signs at junctions, or when confusion is likely • Destination signs typically present • Informational and interpretive signs may be present outside of Wilderness	• Wide variety of signs likely present • Informational signs likely (outside of Wilderness) • Interpretive signs possible (outside of Wilderness) • Trail Universal Access information likely displayed at trailhead	• Wide variety of signage is present • Information and interpretive signs likely • Trail Universal Access information is typically displayed at trailhead •
Typical Recreation Environs & Experience[2]	• Natural, unmodified • ROS: Often Primitive setting, but may occur in other ROS settings • WROS: Primitive	• Natural, essentially unmodified • ROS: Typically Semi-Primitive setting • WROS: Primitive to Semi–Primitive	• Natural, primarily unmodified • ROS: Typically Semi-Primitive to Roaded Natural setting • WROS: Semi-Primitive to Transition	• May be modified • ROS: Typically Roaded Natural to Rural setting • WROS: Transition (rarely present in Wilderness)	• Can be highly modified • ROS: Typically Rural to Urban setting • Commonly associated with Visitor Centers or high-use recreation sites • Not present in Wilderness

[1] For user-specific design criteria and specifications, refer to Forest Service Handbook and other applicable agency references.

[2] Typical Recreation Environment & Experience descriptors are provided to assist with understanding Trail Classes. They represent typical or commonly occurring Trail Class and ROS or WROS setting combinations, but are not intended to indicate combinations that are "allowed" or "not allowed". The appropriate Trail Class should be determined by local managers at the trail-specific level, based on Forest Plan direction and other considerations. While less developed trails may occur in any ROS setting, they typically occur in less developed ROS settings. Similarly, more highly developed trails tend to occur in more highly developed ROS settings, but may occur in less developed ROS settings (with the exception of Trail Class 5 which in not consistent with Primitive settings).

APPENDIX C

Trail Designed Use and Managed Use

Designed Use and Managed Use are basic concepts that are fundamental to effective trail planning, design, construction, maintenance, and management. When applied proactively, and in combination with Trail Class, these technical trail management concepts can form the basis for sound trail planning and management.

Designed Use: The intended use that controls the geometric design of the trail, and determines the subsequent maintenance parameters for the trail.

There is only one Designed Use ("design driver") per trail or trail segment.

Managed Use: The mode(s) of travel that are actively managed and appropriate, considering the design and management of the trail (i.e. the trail is designed and managed to accommodate this use).

There may be more than one Managed Use per trail or trail segment.

Of these Managed Uses, only one is the Designed Use, that determines the technical design, construction and maintenance specifications for the trail.

Designed Use / Managed Use Types:

- All Terrain Vehicle
- Bicycle
- Dogsled
- Hiker/Pedestrian
- Motorcycle
- (Not Specified)
- Pack and Saddle

- Portage
- Snowmobile
- Snowshoe
- Watercraft
- Motorized Watercraft
- Non-Motorized Watercraft
- Cross-Country Ski

Design Parameters: Technical specifications for trail construction and maintenance, based on the Designed Use and Trail Class. (Refer to individual agency technical specifications)

Design parameters include:
- Tread Width
- Surface
- Grade
- Cross-Slope
- Clearing
- Turns

Parameters:

Example 1: Pack and Saddle / Trail Class 2

ParkLand Forest Trail #123 is a single-track trail that's closed to all motorized use.

Although all there are no restrictions on n on-motorized uses and all non-motorized use is allowed (i.e. mountain bikes, llamas, etc.), the trail is actively managed for Pack and Saddle, and Hike / Pedestrian use. The trail is also managed as a Trail Class 2.

Of the two actively **Managed Uses**, Pack and Saddle use generally requires a greater clearing width, height, switchback turning radius, etc. Pack and Saddle use is therefore determined to be the **Designed Use** or the "design driver" that controls the desired geometric shape and subsequent maintenance parameters of the trail. Agency-specific technical specifications or **Design Parameters** for Trail Class 2 Pack and Saddle* will provide the technical construction and maintenance parameters for

the trail (i.e. tread width, surface, grade, cross-slope, clearing, turns, etc.).

USFS

Trail Planning and Management Fundamentals

Trail Type ▪ Trail Class ▪ Managed Use ▪ Designed Use ▪ Design Parameters

Updated: 1/2004

In FY02, with the national introduction of the Infra 5.0 Trails Module Linear Events and TRACS (Trail Assessment and Condition Surveys), five fundamental concepts were introduced as cornerstones of Forest Service trail planning and management:

- Trail Type
- Trail Class
- Managed Use
- Designed Use
- Design Parameters

Although not entirely new, these revised concepts provide an updated and expanded means to consistently record and communicate the intended design and management guidelines for trail design, construction, maintenance and use. Before completing documentation for TRACS Trail Management Objectives (TMO), editing these Linear Events in the Infra Trails Module, or applying these concepts in trail management, it is essential that their intent is clearly understood.

Trail Type

A fundamental trail category that indicates the predominant trail surface or trail foundation, and the general mode of travel the trail accommodates.

Trail Types are exclusive, that is there can only be one Trail Type assigned per trail or trail segment. This allows managers to identify specific trail Design Parameters (technical specifications), management needs and the cost of managing the trail for particular uses and/or seasons by trail or trail segment.

When one Trail Type "overlaps" another, identify each trail or trail segment with its respective Trail Type as a separate route, with its own Trail Name and Trail Number. The "Shared System" data attribute in the Infra Trails Module will allow you to flag the route as also being used as a different type of route or Trail Type, (presumably during a different time of the year). For example, Canyon Ridge Trail 106 may be categorized as a Standard/Terra Trail from MP 0.0 to its end termini at MP 7.4. The first three miles of that same route may also function as a Snow Trail during the winter, in which case a separate record would be established for Canyon Creek Snow Trail #206 from MP 0.0 to MP 3.0. The actual naming and numbering of trails (i.e. Standard/Terra Trails versus Snow Trails) should be consistent with local unit identification protocols.

The three fundamental Trails Types include:

Standard/Terra Trail: *The predominant foundation of the trail is ground (as opposed to snow or water); and that is designed and managed to accommodate ground-based trail use.*

Snow Trail: *The predominant foundation of the trail is snow (as opposed to ground or water); and that is designed and managed to accommodate snow-based trail use.*

Water Trail*: The predominant foundation of the trail is water (as opposed to ground or snow); and that is designed and managed to accommodate trail use by water craft. There may be ground-based Portage segments of Water Trails.*

Trail Class

The prescribed scale of trail development, representing the intended design and management standards of the trail.

- There is only one Trail Class identified per trail or trail segment.

- The National Trail Classes provide a chronological classification of trail development on a scale ranging from Trail Class 1 to Trail Class 5 (see Attachment A: Trail Class Matrix):
  - Trail Class 1: Minimal/Undeveloped Trail
  - Trail Class 2: Simple/Minor Development Trail
  - Trail Class 3: Developed/Improved Trail

- Trail Class 4: Highly Developed Trail
- Trail Class 5: Fully Developed Trail

- Each Trail Class is defined in terms of applicable Tread and Traffic Flow, Obstacles, Constructed Feature and Trail Elements, Signs, Typical Recreation Environment and Experience.

- Trail Class descriptions define "typical" scenarios or combined factors, and exceptions may occur for any factor. In applying Trail Classes, choose the one that most closely matches the managed objective of the trail.

- Trail prescriptions describe the desired management of each trail, based on Forest Plan direction. These prescriptions take into account actively managed trail uses, user preferences, setting, protection of sensitive resources, and other management activities. To meet prescription, each trail is assigned an appropriate Trail Class.

- There is a direct relationship between Trail Class and Managed Use (defined below), and one cannot be determined without consideration of the other.

- These general categories are used to identify applicable Trail Design Parameters (defined below) and to identify basic indicators used for determining the cost to meet national quality standards.

- Trail Classes represent a refinement and expansion of the previously used Forest Service Management Classes: Mainline/Primary, Secondary and Way Trails.

Managed Use

Modes of travel that are actively managed and appropriate, considering the design and management of the trail.

- There may be more than one Managed Use per trail or trail segment.

- Managed Use indicates a management decision or intent to accommodate and/or encourage a specified type of trail use.

Designed Use

The intended use that controls the desired geometric design of the trail, and determines the subsequent maintenance parameters for the trail.

- There is only one Designed Use per trail or trail segment.

- Although the trail may be actively managed for more than one use, and numerous uses may be allowed, only one use is identified as the critical design driver. The Designed Use determines the technical specifications for the design, construction and maintenance of the trail or trail segment. For each Designed Use and applicable Trail Class, there is a corresponding set of nationally standardized technical specifications or Design Parameters.

- Of the actively Managed Uses that the trail is developed and managed for, the Designed Use is the single design driver that determines the technical specifications for the trail. This is somewhat subjective, but the Designed Use is most often the Managed Use that requires the highest level of development. (ie: Pack & Saddle stock require higher and wider clearance than a trail designed for Hikers). In addition to Designed Use, managers must also determine the desired development scale or Trail Class, with Trail Class 1 being the lowest level of development and Trail Class 5 the highest. On a Trail Class 1 Hiker trail, the trail is basically a deer path and in places may disappear and be reacquired later. Trail Class 5 is most often paved, or at least hardened, and is associated with a highly developed Recreation Opportunity Spectrum classification (ROS).

Designed Use / Managed Use Types

- All Terrain Vehicle
- Snow All Terrain Vehicle
- Bicycle
- Dogsled
- Hiker / Pedestrian
- Motorcycle
- Pack and Saddle
- Snowmobile
- Snowshoe
- Watercraft
- Motorized Watercraft
- Non-Motorized Watercraft
- Cross Country Ski

Design Parameters

Technical specifications for trail construction and maintenance, based on the Designed Use and Trail Class.

- The national Trail Design Parameters represent a standardized set of commonly expected construction and maintenance specifications based on Designed Use and Trail Class.

- Local deviations to the Design Parameters may be established based on specific trail conditions, topography and other factors, providing that the variations continue to reflect the general intent of the national Trail Classes.

- Design Parameters are a refinement and expansion of the previously used “Easiest, More Difficult, and Most Difficult” trail categories for communicating Forest Service construction, maintenance and management specifications.

Design Parameters include technical specifications regarding:
- Tread Width
- Surface
- Grade
- Cross-Slope
- Clearing
- Turns

APPENDIX D

FOREST SERVICE RECREATION SITE DEVELOPMENT SCALE DEFINITIONS

Development Scale	Modification Definition
0	**No site modification** o No constructed features evident at the site.
1	**Almost no site modification**. o Rustic or rudimentary improvements designed for protection of the site rather than comfort of the users. o Use of synthetic materials excluded. o Minimum controls are subtle. o No obvious regimentation. o Primary access usually over primitive roads o Spacing informal and extended to minimize contacts between users.
2	**Minimal site modification**. o Rustic or rudimentary improvements designed primarily for protection of the site rather than the comfort of the users. o Use of synthetic materials avoided. o Minimum controls are subtle. o Little obvious regimentation. o Spacing informal and extended to minimize contacts between users. o Primary access usually over primitive roads. o Interpretive services informal, almost subliminal.
3	**Moderate site modification**. o Facilities about equal for protection of natural site and comfort of users. o Contemporary/rustic design of improvements is usually based on use of native materials. Inconspicuous vehicular traffic controls usually provided. o Roads may be hard surfaced and trails formalized. o Development density about 3 family units per acre. o Primary access may be over high standard roads. o Interpretive services informal if offered, but generally direct.

4 **Heavy site modification**.

o Some facilities designed strictly for comfort and convenience of users.
o Luxury facilities not provided.
o Facility design may incorporate synthetic materials.
o Extensive use of artificial surfacing of roads and trails.
o Vehicular traffic control usually obvious.
o Primary access usually over paved roads.
o Development density 3-5 family units per acre.
o Plant materials usually native.
o Interpretive services, if offered, often formal or structured.

5 **Extensive site modification**.

o Facilities mostly designed for comfort and convenience of users and usually include flush toilets; may include showers, bathhouses, laundry facilities, and electrical hookups.
o Synthetic materials commonly used.
o Formal walks or surfaced trails.
o Regimentation of users is obvious.
o Access usually by high-speed highways.
o Development density 5 or more family units per acre.
o Plant materials may be non-native.
o Formal interpretive services usually available.
o Designs formalized and architecture may be contemporary.
o Mowed lawns and clipped shrubs not unusual.

http://www.fs.fed.us/r3/measures/Cost/Infra_RS.htm

APPENDIX E

FSORAG Technical Provisions Referenced in the FSTAG's Technical Provisions

Section 5.2 Tent Pads and Tent Platforms: Section-by-section analysis

The dimensions of tent pads and tent platforms are not specified because the type of tent most commonly used at campgrounds varies widely. For example, at a campground located close to a wilderness area, small tents may be commonly used, whereas at another campground with numerous amenities for children, large, multi-room family tents may be used more often. Local campground managers are the best source of information concerning the tent size most commonly used in an area.

It is not unusual to find six or seven 5-foot-by-8-foot tents in one part of a GFA. Typically, the spaces allotted for these tents are approximately 10 feet by 12 feet. The size of an accessible tent pad would need to be increased to at least 13 feet by 16 feet to accommodate a 5-foot-by-8-foot tent. If all tent spaces were required to meet the FSORAG's technical provisions, a significant amount of additional excavation would be necessary. Because most facilities provided in GFAs are for resource protection rather than visitor comfort and convenience, the scoping for tents is reduced to minimize alteration of the setting, while integrating accessibility. Thus, only at least 5% of tent pads and tent platforms in GFAs are required to comply with section 5.2, in contrast to at least 20% at recreation sites.

The difference in scoping requirements between recreation sites, with a FS Recreation Site Development Scale of 3 or higher and GFAs where the FS Development Scale is 2 of less, reflects recent findings and recommendations from studies in recreation management regarding overnight site design. These studies are making recreation managers rethink how camping units in GFAs should be designed. Typically, areas of flat terrain are the most desirable for camping. However, as use increases, the area of impact continues to expand because the terrain does not discourage campers from using every square foot of flat land available. This expanded use results in extensive loss of vegetation, soil compaction, erosion, and a general degradation of the scenic resources and recreation setting. To minimize these impacts, some recreation managers are recommending that GFA camping units be built on side slopes that are too steep for pitching tents and provide level tent

pads and tent platforms by cutting and filling the slope. This approach accommodates the need for camping units, while minimizing negative impacts on the environment by confining the use to smaller areas.

5.2 TENT PADS AND TENT PLATFORMS: Technical Provision

5.2.1 General. At least 20% of the tent pads and tent platforms provided at a recreation site, with a FS Recreation Site Development Scale of 3 or higher, shall comply with section 5.2 and shall be connected to an ORAR complying with section 2.0.

5.2.1.1. At least 5% of the tent pads and tent platforms provided in a GFA shall comply with section 5.2. Connection to an ORAR is not required.

5.2.2 Clear Floor or Ground Space. Tent pads and tent platforms shall have clear floor or ground space surrounding the tent that is at least 48 inches (1220 mm) wide. This space shall not overlap the ORAR.

> **Exception**. The clear floor or ground space for tent pads and tent platforms may be reduced to no less than 36 inches (915 mm) where one or more conditions for departure in section 1.1 exist.

5.2.3 Slope. The slope of tent pads and tent platforms shall not exceed 1:50 (2%) in any direction.

> **Exception.** Where surface conditions require a slope greater than 1:50 (2%) for proper drainage, a slope of no more than 1:33 (3%) for tent pads and tent platforms is permitted.

5.2.4 Tent Pad Surface. Tent pads shall have a surface that is firm and stable and designed to allow use of tent stakes and other securing devices.

> **Exception**. Section 5.2.4 does not apply where one or more conditions for departure in section 1.1 exist.

5.2.5 Tent Platform Surface. The surface of tent platforms shall be firm and stable. The type of surface should be appropriate to the setting and level of development.

5.2.6 Edge Protection. Where provided, edge protection for tent platforms shall be at least 3 inches (75 mm) high.

5.2.7 Connection. The surface of tent platforms shall be accessible by a ramp or transfer or directly from adjacent ground surface.

Section 6.7 Pit Toilets in General Forest Areas (GFAs): Section-by-section Analysis

In contrast to toilet buildings at recreation sites with a FS Recreation Site Development Scale of 3 or higher, pit toilets are primitive outhouses that are provided only in GFAs with a FS Development Scale of 2 of less. Like other constructed elements in GFAs, pit toilets are provided primarily for resource protection, rather than visitor comfort and convenience. Pit toilets may consist simply of a hole dug in the ground covered by a toilet riser. The pit toilet riser may or may not be surrounded by walls and may or may not have a roof. Pit toilets may be permanently installed or may be moved from one location to another as the pit is filled or the area becomes severely impacted from use. Waste in pit toilets may be disposed of directly into the pit or may be composted. Pit toilets in GFAs do not have to be connected to an ORAR.

The design of pit toilets varies widely depending on the setting, the amount of expected use, and the process used to manage the waste. An accessible pit toilet is not required to have walls, a floor, a door, or a roof. However, if a pit toilet has a riser and toilet seat, the total height of the seat and the riser must be 17 to 19 inches above the ground or floor. The riser should have vertical sides, a flat area on either side of the seat that is approximately 3 inches wide, and a seat cover that also functions as a back rest.

If the pit toilet has a constructed floor, per 304.3 of the ABAAS, it must accommodate, clear of obstructions, either a circular turning space 60 inches in diameter or a T-shaped turning space within a 60-inch square. If a door is provided, it must open out, slide, or otherwise not obstruct the clear floor or ground space in the pit toilet.

If the pit toilet has walls that will sustain 250 pounds of force, grab bars complying with 604.5 and 609 of the ABAAS must be

mounted on the walls. Privacy screens that do not support 250 pounds of force may be used at pit toilets. However, for safety reasons, grab bars must not be mounted on these lightweight screens.

Effort should be made to locate a pit toilet entrance at ground level. Some pit toilets are designed to process waste, which requires the riser to be placed above the processing unit. For these toilets, use a slope that permits the entrance to remain at ground level. If the layout of the site requires the pit toilet floor to be located above the ground, a trail or ramp complying with section 7.3 of the FSTAG must be provided from the ground to the entrance.

If a trail or ramp is not feasible because one or more conditions for departure in section 1.1 exist, steps into the pit toilet may be provided, but only as a last resort. If steps have to be used, specifications for steps similar to those used in accessible play areas are enumerated in the FSORAG. These steps can serve as transfer landings. The step treads must be at least 14 inches deep and 36 inches wide, and the step riser should be between 6 and 9 inches high. A level clear floor or ground space that is 30 inches by 48 inches must be provided along one side of the steps. One of the steps must fall between 17 and 19 inches above the clear floor or ground space. Single steps are hazards and should be avoided. Where steps are necessary, at least two steps, but preferably three, should be provided.

6.7 PIT TOILETS IN GENERAL FOREST AREAS (GFAs): Technical Provisions

6.7.1 General. All pit toilets provided in GFAs, with a FS Recreation Site Development Scale of 2 or less, shall comply with section 6.7.

6.7.2 Height. The total height of the toilet seat and the riser for a pit toilet shall be between 17 to 19 inches above the ground or floor.

6.7.3 Clear Floor or Ground Space in Pit Toilets Enclosed by Walls. In pit toilets with 4 walls or privacy screens, a clear floor or ground space of 60 inches (1525 mm) by 56 inches (1420 mm) that complies with 604.3.1 of the ABAAS shall be provided. Portions of this turning space may overlap the interior clear floor or ground space or be located directly outside the entrance. The center line of the toilet riser shall be 16 to 18 inches from the back wall, and the back of the riser shall be

flush with a sidewall.

> **Exception.** The clear floor or ground space required by 604.3.1 of the ABAAS may be reduced to 56 inches (1420 mm) by 48 inches (1220 mm) where one or more conditions for departure in section 1.1 exist.

6.7.4 Doorways. Doorways of pit toilets shall have a clear width of at least 32 inches (815 mm) to comply with 308 and 404.2.7 of the ABAAS**.** If a door is provided, it shall open out, slide, or otherwise not obstruct the clear floor or ground space inside a pit toilet. To comply with 404.2.7 of the ABAAS, any door hardware provided shall be operable with one hand, without pinching, grasping, or twisting the wrist, with no more than 5 pounds of pressure.

6.7.5 Grab Bars. If a pit toilet has walls that can withstand 250 pounds of force, grab bars complying with 604.5 and 609 of the ABAAS shall be provided. Grab bars shall not be installed in a pit toilet with lightweight privacy screens.

6.7.6 Clear Floor or Ground Space in Pit Toilets That Are Not Enclosed by Walls. In pit toilets with fewer than 4 walls or privacy screens, a clear floor or ground space of 60 inches (1525 mm) by 56 inches (1420 mm) that complies with 604.3.1 of the ABAAS shall be provided.

> **Exception**. The clear floor or ground space required by 604.3.1 of the ABAAS may be reduced to 56 inches (1420 mm) by 48 inches (1220 mm) where one or more conditions for departure in section 1.1 exist.

6.7.7 Slope. The slope of the clear floor or ground space required by sections 6.7.3, 6.7.6, and 6.7.9 shall not exceed 1:50 (2%) in any direction.

> **Exception 1.** Where surface conditions require a slope greater than 1:50 (2%) for proper drainage, a slope of no more than 1:33 (3%) for the clear floor or ground space required by sections 6.7.3, 6.7.6, and 6.7.9 is permitted.
>
> **Exception 2**. Section 6.7.7 does not apply where one or more conditions for departure in section 1.1 exist.

6.7.8 Surface. The surface of the clear floor or ground space required by section 6.7.3, 6.7.6, and 6.7.9 shall be firm and stable. The type of surface should be appropriate to the setting and level of development.

Exception. Section 6.7.8 does not apply where one or more conditions for departure in section 1.1 exist.

6.7.9 Entrance. The entrance to a pit toilet should be at ground level.

Exception 1. If the floor of a pit toilet has to be located above the ground because of operation and maintenance requirements for the pit toilet, a trail shall be provided from the ground to the entrance. The trail shall comply with section 7.3 of the FSTAG.

Exception 2. Where the floor of a pit toilet is located above the ground and a trail from the ground to the entrance is not feasible because one or more conditions for departure in section 1.1 exist, steps may be provided. The steps that lead up to the toilet building shall comply with the following:

(1) Step Tread. The step tread shall be at least 14 inches (355 mm) deep and at least 36 inches (610 mm) wide.

(2) Step Riser. The step riser shall be no more than 9 inches (205 mm) high and shall be uniform for all connected steps. Where multiple steps are required, one step shall be at least 17 inches (430 mm) but no more than 19 inches (485 mm) above the ground, so that the step can function as a transfer platform.

(3) Clear Floor or Ground Space. To comply with 305.3 of the ABAAS, clear floor or ground space of at least 30 inches (760 mm) by 48 inches (1220 mm) shall be provided adjacent to one unobstructed side of the steps and shall be positioned so that a person in a wheelchair can transfer onto a step that is at least 17 inches (430 mm) but no more than 19 inches (485 mm) above the clear floor or ground space.

APPENDIX E

Provisions of the Architectural Barriers Act Accessibility Standards that are referenced in the FSORAG Technical Provisions

The Architectural Barriers Act Accessibility Standards are contained in the ABA chapters 1 and 2 and 3 through 10 of the Americans with Disabilities Act / Architectural Barriers Act Accessibility Standards. (www.access-board.gov).

F221.2.1.1 - Assembly Areas:

(a) In places of assembly with fixed seating accessible wheelchair locations shall comply with 802 of the Architectural Barriers Act Accessibility Standards and shall be provided consistent with the following table:

F221.2.1.1 Number of Wheelchair Spaces in Assembly Areas

Number of Seats	Minimum Number of Required Wheelchair Spaces
4 to 25	1
26 to 50	2
51 to 150	4
151 to 300	5
301 to 500	6
501 to 5000	6, plus 1 for each 150, or fraction thereof, between 501 through 5000

5001 and over	36, plus 1 for each 200, or fraction thereof, over 5000

F221.2.2 - Integration
Wheelchair spaces shall be an integral part of the seating plan.

304 - Turning Space

304.1 General. Turning space shall comply with 304.

304.2 Floor or Ground Surfaces. Floor or ground surfaces of a turning space shall comply with 302. Changes in level are not permitted.
EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

Advisory 304.2 Floor or Ground Surface Exception. As used in this section, the phrase "changes in level" refers to surfaces with slopes and to surfaces with abrupt rise exceeding that permitted in Section 303.3. Such changes in level are prohibited in required clear floor and ground spaces, turning spaces, and in similar spaces where people using wheelchairs and other mobility devices must park their mobility aids such as in wheelchair spaces, or maneuver to use elements such as at doors, fixtures, and telephones. The exception permits slopes not steeper than 1:48.

304.3 Size. Turning space shall comply with 304.3.1 or 304.3.2.

304.3.1 Circular Space. The turning space shall be a space of 60 inches (1525 mm) diameter minimum. The space shall be permitted to include knee and toe clearance complying with 306.

304.3.2 T-Shaped Space. The turning space shall be a T-shaped space within a 60 inch (1525 mm) square minimum with arms and base 36 inches (915 mm) wide minimum. Each arm of the T shall be clear of obstructions 12 inches (305 mm) minimum in each direction and the base shall be clear of obstructions 24 inches (610 mm) minimum. The space shall be permitted to include knee and toe clearance complying with 306 only at the end of either the base or one arm.

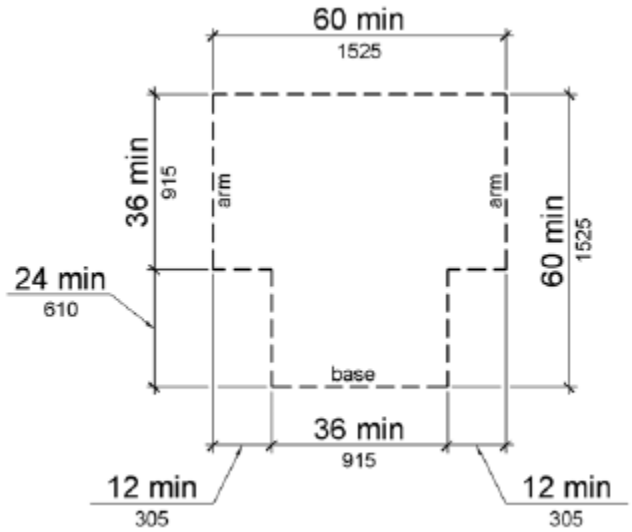


Figure 304.3.2 T-Shaped Turning Space

305 - Clear Floor or Ground Space for Wheelchairs.

305.1 General. Clear floor or ground space shall comply with 305.

305.2 Floor or Ground Surfaces. Floor or ground surfaces of a clear floor or ground space shall comply with 302. Changes in level are not permitted.

EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

305.3 Size. The clear floor or ground space shall be 30 inches (760 mm) minimum by 48 inches (1220 mm) minimum.

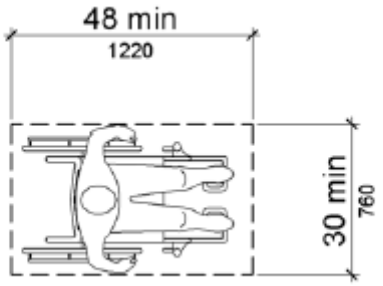


Figure 305.3 Clear Floor or Ground Space

305.4 Knee and Toe Clearance. Unless otherwise specified, clear floor or ground space shall be permitted to include knee and toe clearance complying with 306.

305.5 Position. Unless otherwise specified, clear floor or ground space shall be positioned for either forward or parallel approach to an element.

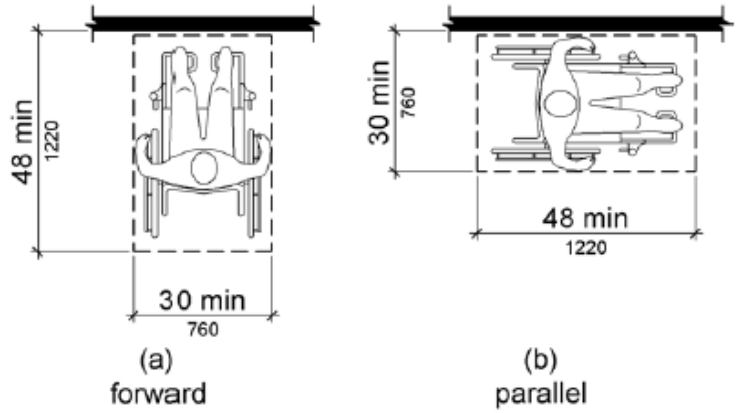


Figure 305.5 Position of Clear Floor or Ground Space

305.6 Approach. One full unobstructed side of the clear floor or ground space shall adjoin an accessible route or adjoin another clear floor or ground space.

305.7 Maneuvering Clearance. Where a clear floor or ground space is located in an alcove or otherwise confined on all or part of three sides, additional maneuvering clearance shall be provided in accordance with 305.7.1 and 305.7.2.

305.7.1 Forward Approach. Alcoves shall be 36 inches (915 mm)wide minimum where the depth exceeds 24 inches (610 mm).

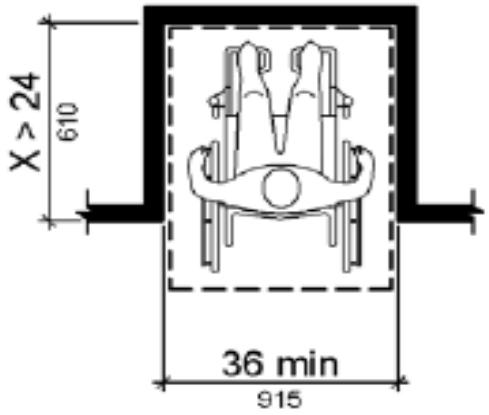


Figure 305.7.1 Maneuvering Clearance in an Alcove, Forward Approach

305.7.2 Parallel Approach. Alcoves shall be 60 inches (1525 mm) wide minimum where the depth exceeds 15 inches (380 mm).

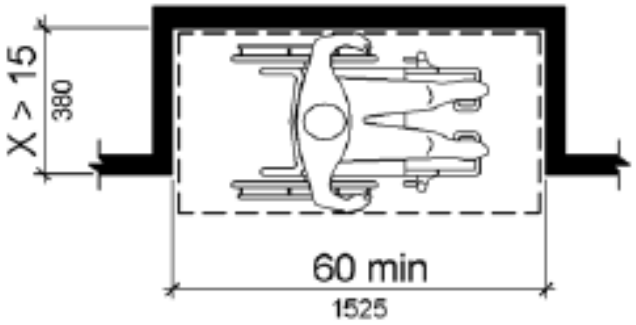


Figure 305.7.2 Maneuvering Clearance in an Alcove, Parallel Approach

306 Knee and Toe Clearance

306.1 General. Where space beneath an element is included as part of clear floor or ground space or turning space, the space shall comply with 306. Additional space shall not be prohibited beneath an element but shall not be considered as part of the clear floor or ground space or turning space.

Advisory 306.1 General. Clearances are measured in relation to the usable clear floor space, not necessarily to the vertical support for an element. When determining clearance under an object for required turning or maneuvering space, care should be taken to ensure the space is clear of any obstructions.

306.2 Toe Clearance.

306.2.1 General. Space under an element between the finish floor or ground and 9 inches (230 mm) above the finish floor or ground shall be considered toe clearance and shall comply with 306.2.

306.2.2 Maximum Depth. Toe clearance shall extend 25 inches (635 mm) maximum under an element.

306.2.3 Minimum Required Depth. Where toe clearance is required at an element as part of a clear floor space, the toe clearance shall extend 17 inches (430 mm) minimum under the element.

306.2.4 Additional Clearance. Space extending greater than 6 inches (150 mm) beyond the available knee clearance at 9 inches (230 mm) above the finish floor or ground shall not be considered toe clearance.

306.2.5 Width. Toe clearance shall be 30 inches (760 mm) wide minimum.

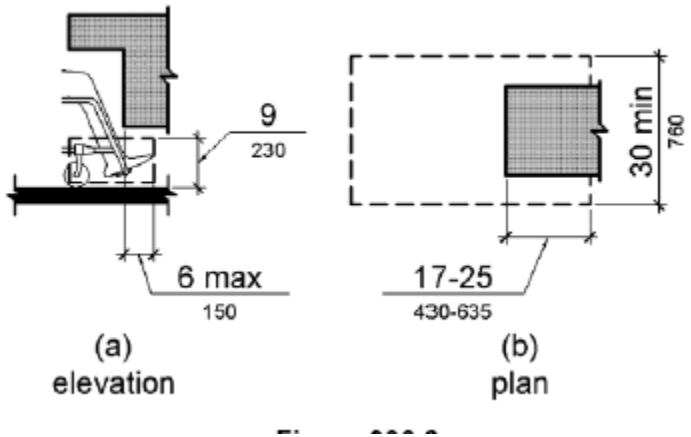


Figure 306.2 Toe Clearance

306.3 Knee Clearance.

306.3.1 General. Space under an element between 9 inches (230 mm) and 27 inches (685 mm) above the finish floor or ground shall be considered knee clearance and shall comply with 306.3.

306.3.2 Maximum Depth. Knee clearance shall extend 25 inches (635 mm) maximum under an element at 9 inches (230 mm) above the finish floor or ground.

306.3.3 Minimum Required Depth. Where knee clearance is required under an element as part of a clear floor space, the knee clearance shall be 11 inches (280 mm) deep minimum at 9 inches (230 mm) above the finish floor or ground, and 8 inches (205 mm) deep minimum at 27 inches (685 mm) above the finish floor or ground.

306.3.4 Clearance Reduction. Between 9 inches (230 mm) and 27 inches (685 mm) above the finish floor or ground, the knee clearance shall be permitted to reduce at a rate of 1 inch (25 mm) in depth for each 6 inches (150 mm) in height.

306.3.5 Width. Knee clearance shall be 30 inches (760 mm) wide minimum.

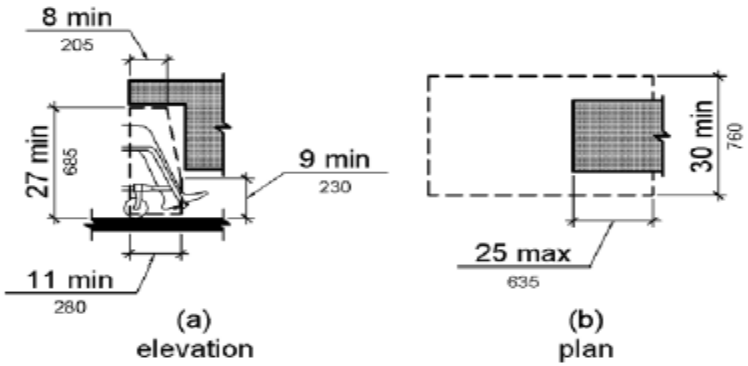


Figure 306.3 Knee Clearance

307 Protruding Objects

307.1 General. Protruding objects shall comply with 307.

307.2 Protrusion Limits. Objects with leading edges more than 27 inches (685 mm) and not more than 80 inches (2030 mm) above the finish floor or ground shall protrude 4 inches (100 mm) maximum horizontally into the circulation path.
EXCEPTION: Handrails shall be permitted to protrude 4 1/2 inches (115 mm) maximum.

Advisory 307.2 Protrusion Limits. When a cane is used and the element is in the detectable range, it gives a person sufficient time to detect the element with the cane before there is body contact. Elements located on circulation paths, including operable elements, must comply with requirements for protruding objects. For example, awnings and their supporting structures cannot reduce the minimum required vertical clearance. Similarly, casement windows, when open, cannot encroach more than 4 inches (100 mm) into circulation paths above 27 inches (685 mm).

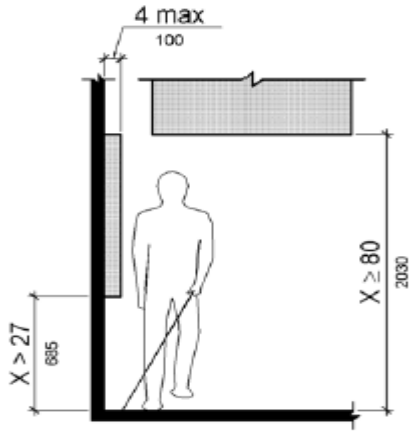


Figure 307.2Limits of Protruding

Objects

307.3 Post-Mounted Objects. Free-standing objects mounted on posts or pylons shall overhang circulation paths 12 inches (305 mm) maximum when located 27 inches (685 mm) minimum and 80 inches (2030 mm) maximum above the finish floor or ground. Where a sign or other obstruction is mounted between posts or pylons and the clear distance between the posts or pylons is greater than 12 inches (305 mm), the lowest edge of such sign or obstruction shall be 27 inches (685 mm) maximum or 80 inches (2030 mm) minimum above the finish floor or ground.
EXCEPTION: The sloping portions of handrails serving stairs and ramps shall not be required to comply with 307.3.

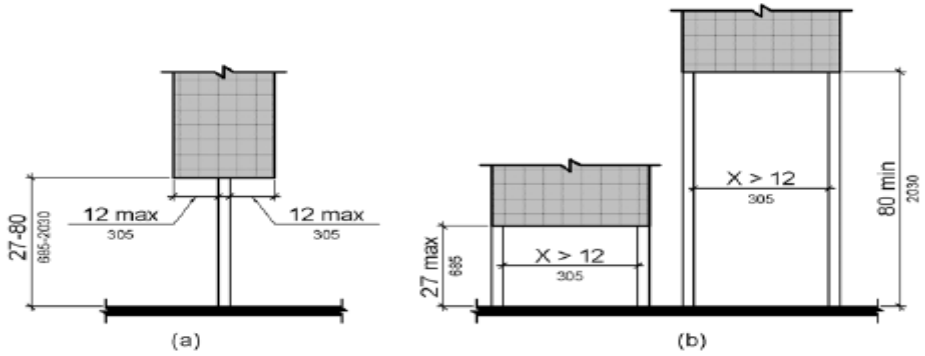


Figure 307.3 Post-Mounted Protruding Objects

307.4 Vertical Clearance. Vertical clearance shall be 80 inches (2030 mm) high minimum. Guardrails or other barriers shall be provided where the vertical clearance is less than 80 inches (2030 mm) high. The leading edge of such guardrail or barrier shall be located 27 inches (685 mm) maximum above the finish floor or ground.
EXCEPTION: Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the finish floor or ground.

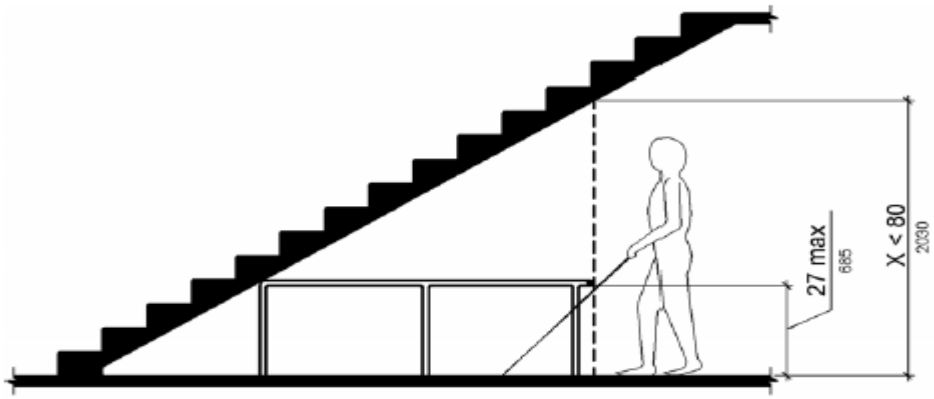


Figure 307.4 Vertical Clearance

. Protruding objects shall not reduce the clear width required for accessible routes.

308 Reach Ranges

308.1 General. Reach ranges shall comply with 308.

Advisory 308.1 General. The following table provides guidance on reach ranges for children according to age where building elements such as coat hooks, lockers, or operable parts are designed for use primarily by children. These dimensions apply to either forward or side reaches. Accessible elements and operable parts designed for adult use or children over age 12 can be located outside these ranges but must be within the adult reach ranges required by 308.
Children's Reach Ranges

Forward or Side Reach	Ages 3 and 4	Ages 5 through 8	Ages 9 through 12
High (maximum)	36 in (915 mm)	40 in (1015 mm)	44 in (1120 mm)
Low (minimum)	20 in (510 mm)	18 in (455 mm)	16 in (405 mm)

308.2 Forward Reach.

308.2.1 Unobstructed. Where a forward reach is unobstructed, the high forward reach shall be 48 inches (1220 mm) maximum and the low forward reach shall be 15 inches (380 mm) minimum above the finish floor or ground.

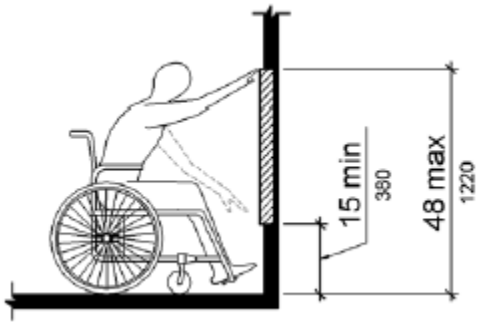


Figure 308.2.1 Unobstructed Forward Reach

308.2.2 Obstructed High Reach. Where a high forward reach is over an obstruction, the clear floor space shall extend beneath the element for a distance not less than the required reach depth over the obstruction. The high forward reach shall be 48 inches (1220 mm) maximum where the reach depth is 20 inches (510 mm) maximum. Where the reach depth exceeds 20 inches (510 mm), the high forward reach shall be 44 inches (1120 mm) maximum and the reach depth shall be 25 inches (635 mm) maximum.

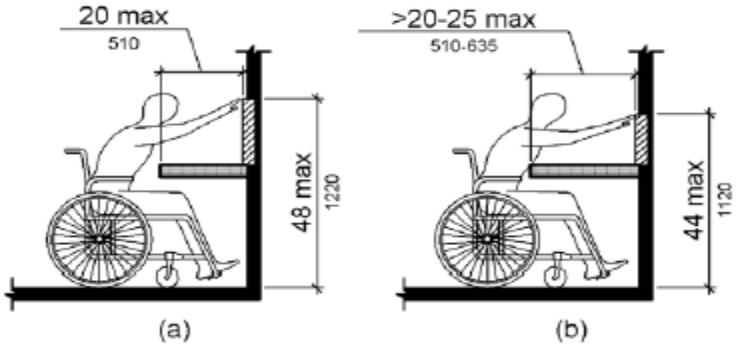


Figure 308.2.2 Obstructed High Forward Reach

308.3 Side Reach.

308.3.1 Unobstructed. Where a clear floor or ground space allows a parallel approach to an element and the side reach is unobstructed, the high side reach shall be 48 inches (1220 mm) maximum and the low side reach shall be 15 inches (380 mm) minimum above the finish floor or ground.

EXCEPTIONS:

1. An obstruction shall be permitted between the clear floor or ground space and the element where the depth of the obstruction is 10 inches (255 mm) maximum.
2. Operable parts of fuel dispensers shall be permitted to be 54 inches (1370 mm) maximum measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

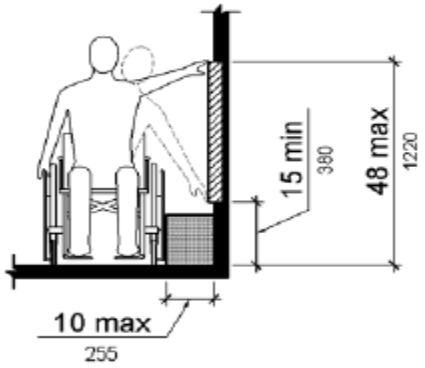


Figure 308.3.1 Unobstructed Side Reach

308.3.2 Obstructed High Reach. Where a clear floor or ground space allows a parallel approach to an element and the high side reach is over an obstruction, the height of the obstruction shall be 34 inches (865 mm) maximum and the depth of the obstruction shall be 24 inches (610 mm) maximum. The high side reach shall be 48 inches (1220 mm) maximum for a reach depth of 10 inches (255 mm) maximum. Where the reach depth exceeds 10 inches (255 mm), the high side reach shall be 46 inches (1170 mm) maximum for a reach depth of 24 inches (610 mm) maximum.

EXCEPTIONS:

1. The top of washing machines and clothes dryers shall be permitted to be 36 inches (915 mm) maximum above the finish floor.
2. Operable parts of fuel dispensers shall be permitted to be 54 inches (1370 mm) maximum measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

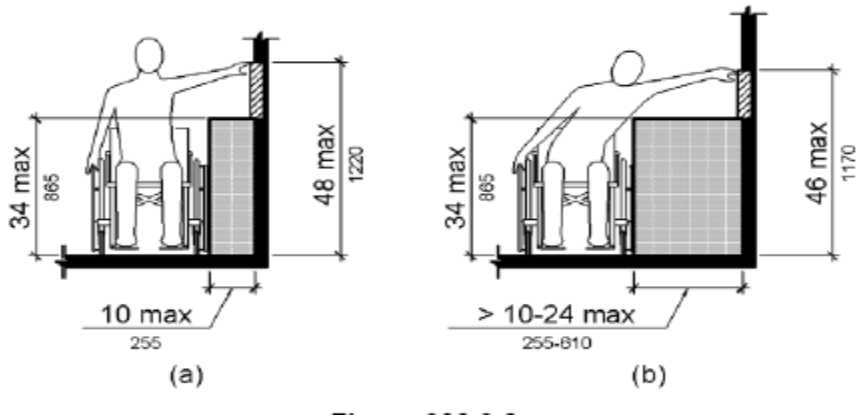


Figure 308.3.2 Obstructed High Side Reach

309 Operable Parts

309.1 General. Operable parts shall comply with 309.

309.2 Clear Floor Space. A clear floor or ground space complying with 305 shall be provided.

309.3 Height. Operable parts shall be placed within one or more of the reach ranges specified in 308.

309.4 Operation. Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2 N) maximum.

EXCEPTION:

Gas pump nozzles shall not be required to provide operable parts that have an activating force of 5 pounds (22.2 N) maximum.

404.2.3 Doorways - Clear Width. Door openings shall provide a clear width of 32 inches (815 mm) minimum. Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees. Openings more than 24 inches (610 mm) deep shall provide a clear opening of 36 inches (915 mm) minimum. There shall be no projections into the required clear opening width lower than 34 inches (865 mm) above the finish floor or ground. Projections into the clear opening width between 34 inches (865 mm) and 80 inches (2030 mm) above the finish floor or ground shall not exceed 4 inches (100 mm).

EXCEPTIONS: 1. In alterations, a projection of 5/8 inch (16 mm) maximum into the required clear width shall be permitted for the latch side stop.

2. Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the finish floor or ground.

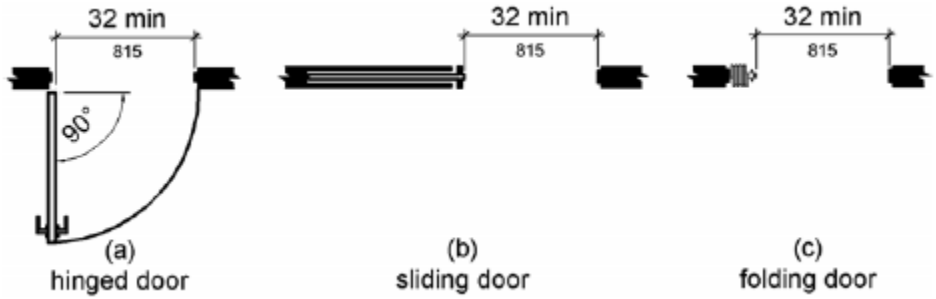


Figure 404.2.3 Clear Width of Doorways

404.2.7 Door and Gate Hardware. Handles, pulls, latches, locks, and other operable parts on doors and gates shall comply with 309.4. Operable parts of such hardware shall be 34 inches (865 mm) minimum and 48 inches (1220 mm) maximum above the finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.

603 Toilet and Bathing Rooms (for toilet buildings with a single riser such as SSTs etc.- but not for Pit toilets…see definition of pit toilet in Technical Provisions section of FSORAG)

603.1 General. Toilet and bathing rooms shall comply with 603.

603.2 Clearances. Clearances shall comply with 603.2.

603.2.1 Turning Space. Turning space complying with 304 shall be provided within the room.

603.2.2 Overlap. Required clear floor spaces, clearance at fixtures, and turning space shall be permitted to overlap.

603.2.3 Door Swing. Doors shall not swing into the clear floor space or clearance required for any fixture. Doors shall be permitted to swing into the required turning space.
EXCEPTIONS: 1. Doors to a toilet room or bathing room for a single occupant accessed only through a private office and not for common use or public use shall be permitted to swing into the clear floor space or clearance provided the swing of the door can be reversed to comply with 603.2.3.
2. Where the toilet room or bathing room is for individual use and a clear floor space complying with 305.3 is provided within the room beyond the arc of the door swing, doors shall be permitted to swing into the clear floor space or clearance required for any fixture.

Advisory 603.2.3 Door Swing Exception 1. At the time the door is installed, and if the door swing is reversed in the future, the door must meet all the requirements specified in 404. Additionally, the door swing cannot reduce the required width of an accessible route. Also, avoid violating other building or life safety codes when the door swing is reversed.

603.3 Mirrors. Mirrors located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 40 inches (1015 mm) maximum above the finish floor or ground. Mirrors not located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 35 inches (890 mm) maximum above the finish floor or ground.

Advisory 603.3 Mirrors. A single full-length mirror can accommodate a greater number of people, including children. In order for mirrors to be usable by people who are ambulatory and people and people who use wheelchairs, the top edge of mirrors should be 74 inches (1880 mm) minimum from the floor or ground.

603.4 Coat Hooks and Shelves. Coat hooks shall be located within one of the reach ranges specified in 308. Shelves shall be located 40 inches (1015 mm) minimum and 48 inches (1220 mm) maximum above the finish floor.

604 Water Closets and Toilet Compartments (for toilet buildings with multiple risers provided at recreation sites with FS Recreation Site Development Scale of 3 or higher...and for the Exception under Pit Toilets in General Forest Areas FSORAG 6.6)

604.1 General. Water closets and toilet compartments shall comply with 604.2 through 604.8.**EXCEPTION:** Water closets and toilet compartments for children's use shall be permitted to comply with 604.9.

604.2 Location. The water closet shall be positioned with a wall or partition to the rear and to one side. The centerline of the water closet shall be 16 inches (405 mm) minimum to 18 inches (455 mm) maximum from the side wall or partition, except that the water closet shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum from the side wall or partition in the ambulatory accessible toilet compartment specified in 604.8.2. Water closets shall be arranged for a left-hand or right-hand approach.

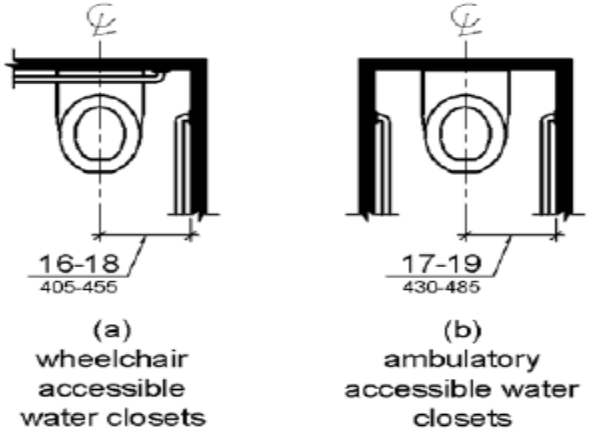


Figure 604.2 Water Closet Location

604.3 Clearance. Clearances around water closets and in toilet compartments shall comply with 604.3.

604.3.1 Size. Clearance around a water closet shall be 60 inches (1525 mm) minimum measured perpendicular from the side wall and 56 inches (1420 mm) minimum measured perpendicular from the rear wall.

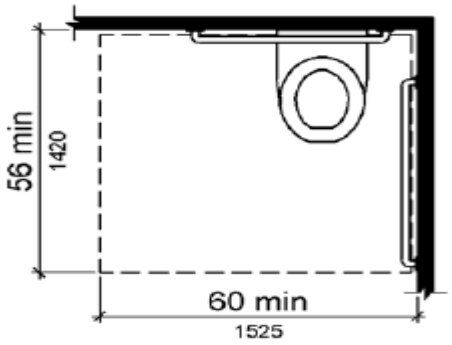


Figure 604.3.1 Size of Clearance at Water Closets

604.3.2 Overlap. The required clearance around the water closet shall be permitted to overlap the water closet, associated grab bars, dispensers, sanitary napkin disposal units, coat hooks, shelves, accessible routes, clear floor space and clearances required at other fixtures, and the turning space. No other fixtures or obstructions shall be located within the required water closet clearance.

EXCEPTION: In residential dwelling units, a lavatory complying with 606 shall be permitted on the rear wall 18 inches (455 mm) minimum from the water closet centerline where the clearance at the water closet is 66 inches (1675 mm) minimum measured perpendicular from the rear wall.

604.4 Seats. The seat height of a water closet above the finish floor shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum measured to the top of the seat. Seats shall not be sprung to return to a lifted position.

EXCEPTIONS: 1. A water closet in a toilet room for a single occupant accessed only through a private office and not for common use or public use shall not be required to comply with 604.4.

2. In residential dwelling units, the height of water closets shall be permitted to be 15 inches (380 mm) minimum and 19 inches (485 mm) maximum above the finish floor measured to the top of the seat.

604.5 Grab Bars. Grab bars for water closets shall comply with 609. Grab bars shall be provided on the side wall closest to the water closet and on the rear wall.

Advisory 604.5 Grab Bars Exception 2. Reinforcement must be sufficient to permit the installation of rear and side wall grab bars that fully meet all accessibility requirements including, but not limited to, required length, installation height, and structural strength.

604.5.1 Side Wall. The side wall grab bar shall be 42 inches (1065 mm) long minimum, located 12 inches (305 mm) maximum from the rear wall and extending 54 inches (1370 mm) minimum from the rear wall.

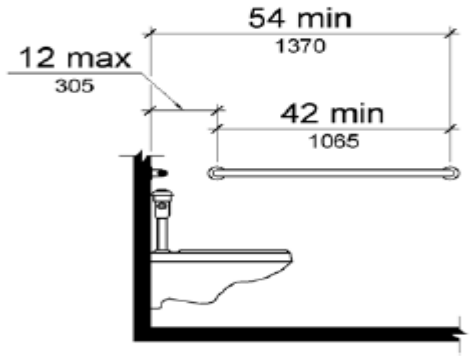


Figure 604.5.1 Side Wall Grab Bar at Water Closets

604.5.2 Rear Wall. The rear wall grab bar shall be 36 inches (915 mm) long minimum and extend from the centerline of the water closet 12 inches (305 mm) minimum on one side and 24 inches (610 mm) minimum on the other side.

EXCEPTIONS: 1. The rear grab bar shall be permitted to be 24 inches (610 mm) long minimum, centered on the water closet, where wall space does not permit a length of 36 inches (915 mm) minimum due to the location of a recessed fixture adjacent to the water closet.

2. Where an administrative authority requires flush controls for flush valves to be located in a position that conflicts with the location of the rear grab bar, then the rear grab bar shall be permitted to be split or shifted to the open side of the toilet area.

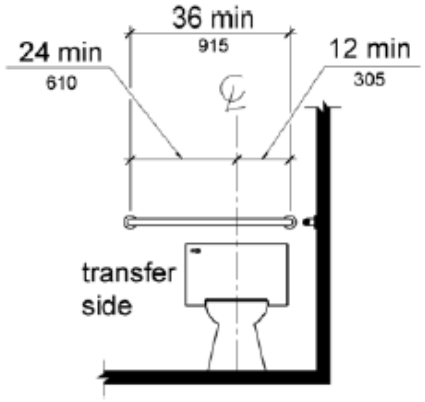


Figure 604.5.2 Rear Wall Grab Bar at Water Closets

604.6 Flush Controls. Flush controls shall be hand operated or automatic. Hand operated flush controls shall comply with 309. Flush controls shall be located on the open side of the water closet except in ambulatory accessible compartments complying with 604.8.2.

Advisory 604.6 Flush Controls. If plumbing valves are located directly behind the toilet seat, flush valves and related plumbing can cause injury or imbalance when a person leans back against them. To prevent causing injury or imbalance, the plumbing can be located behind walls or to the side of the toilet; or if approved by the local authority having jurisdiction, provide a toilet seat lid.

604.7 Dispensers. Toilet paper dispensers shall comply with 309.4 and shall be 7 inches (180 mm) minimum and 9 inches (230 mm) maximum in front of the water closet measured to the centerline of the dispenser. The outlet of the dispenser shall be 15 inches (380 mm) minimum and 48 inches (1220 mm) maximum above the finish floor and shall not be located behind grab bars. Dispensers shall not be of a type that controls delivery or that does not allow continuous paper flow.

Advisory 604.7 Dispensers. If toilet paper dispensers are installed above the side wall grab bar, the outlet of the toilet paper dispenser must be 48 inches (1220 mm) maximum above the finish floor and the top of the gripping surface of the grab bar must be 33 inches (840 mm) minimum and 36 inches (915 mm) maximum above the finish floor.

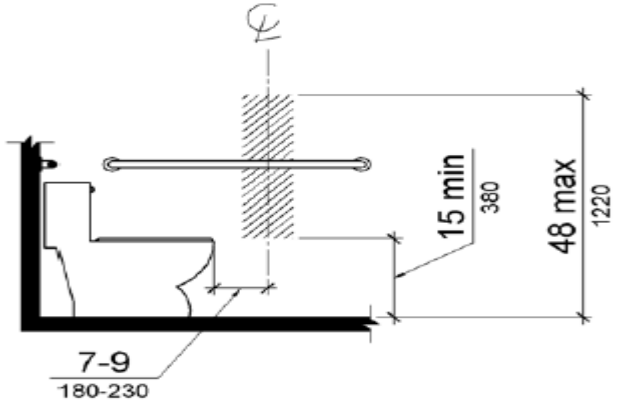


Figure 604.7 Dispenser Outlet Location

604.8 Toilet Compartments. Wheelchair accessible toilet compartments shall meet the requirements of 604.8.1 and 604.8.3. Compartments containing more than one plumbing fixture shall comply with 603. Ambulatory accessible compartments shall comply with 604.8.2 and 604.8.3.

604.8.1 Wheelchair Accessible Compartments. Wheelchair accessible compartments shall comply with 604.8.1.

604.8.1.1 Size. Wheelchair accessible compartments shall be 60 inches (1525 mm) wide minimum measured perpendicular to the side wall, and 56 inches (1420 mm) deep minimum for wall hung water closets and 59 inches (1500 mm) deep minimum for floor mounted water closets measured perpendicular to the rear wall. Wheelchair accessible compartments for children's use shall be 60 inches (1525 mm) wide minimum measured perpendicular to the side wall, and 59 inches (1500 mm) deep minimum for wall hung and floor mounted

water closets measured perpendicular to the rear wall.

Advisory 604.8.1.1 Size. The minimum space required in toilet compartments is provided so that a person using a wheelchair can maneuver into position at the water closet. This space cannot be obstructed by baby changing tables or other fixtures or conveniences, except as specified at 604.3.2 (Overlap). If toilet compartments are to be used to house fixtures other than those associated with the water closet, they must be designed to exceed the minimum space requirements. Convenience fixtures such as baby changing tables must also be accessible to people with disabilities as well as to other users. Toilet compartments that are designed to meet, and not exceed, the minimum space requirements may not provide adequate space for maneuvering into position at a baby changing table.

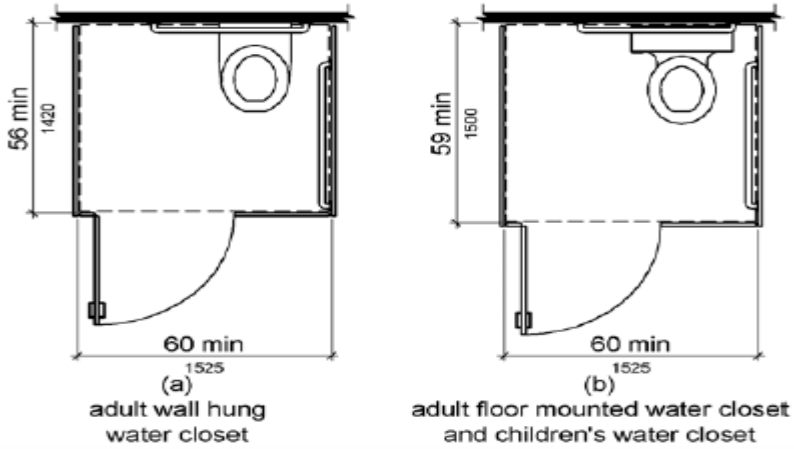


Figure 604.8.1.1 Size of Wheelchair Accessible Toilet Compartment

604.8.1.2 Doors. Toilet compartment doors, including door hardware, shall comply with 404 except that if the approach is to the latch side of the compartment door, clearance between the door side of the compartment and any obstruction shall be 42 inches (1065 mm) minimum. Doors shall be located in the front partition or in the side wall or partition farthest from the water closet. Where located in the front partition, the door opening shall be 4 inches (100 mm) maximum from the side wall or partition farthest from the water closet. Where located in the side wall or partition, the door opening shall be 4 inches (100 mm) maximum from the front partition. The door shall be self-closing. A door pull complying with 404.2.7 shall be placed on both sides of the door near the latch. Toilet compartment doors shall not swing into the minimum required compartment area.

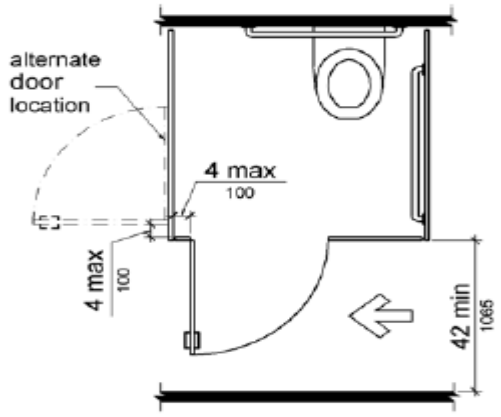


Figure 604.8.1.2 Wheelchair Accessible Toilet Compartment Doors

604.8.1.3 Approach. Compartments shall be arranged for left-hand or right-hand approach to the water closet.

604.8.1.4 Toe Clearance. The front partition and at least one side partition shall provide a toe clearance of 9 inches (230 mm) minimum above the finish floor and 6 inches (150 mm) deep minimum beyond the compartment-side face of the partition, exclusive of partition support members. Compartments for children's use shall provide a toe clearance of 12 inches (305 mm) minimum above the finish floor.

EXCEPTION: Toe clearance at the front partition is not required in a compartment greater than 62 inches (1575 mm) deep with a wall-hung water closet or 65 inches (1650 mm) deep with a floor-mounted water closet. Toe clearance at the side partition is not required in a compartment greater than 66 inches (1675 mm) wide. Toe clearance at the front partition is not required in a compartment for children's use that is greater than 65 inches (1650 mm) deep.

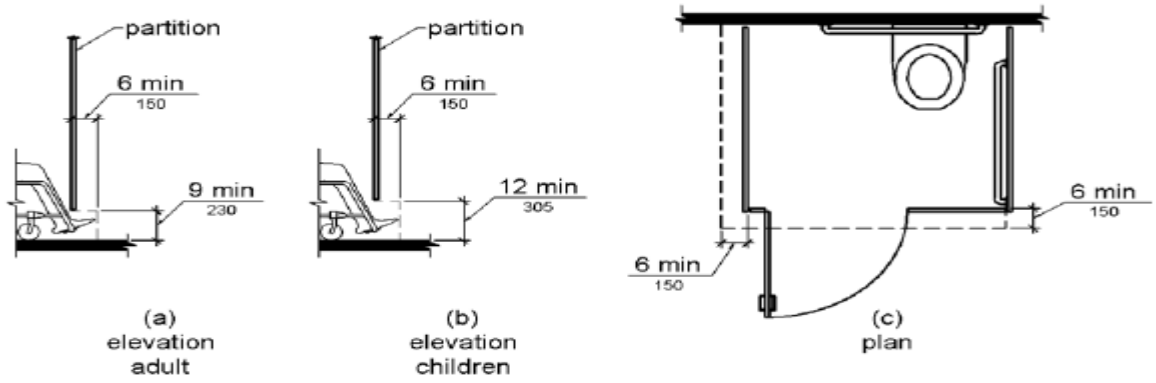


Figure 604.8.1.4 Wheelchair Accessible Toilet Compartment Toe Clearance

604.8.1.5 Grab Bars. Grab bars shall comply with 609. A side-wall grab bar complying with 604.5.1 shall be provided and shall be located on the wall closest to the water closet. In addition, a rear-wall grab bar complying with 604.5.2 shall be provided.

604.8.2 Ambulatory Accessible Compartments. Ambulatory accessible compartments shall comply with 604.8.2.

604.8.2.1 Size. Ambulatory accessible compartments shall have a depth of 60 inches (1525 mm) minimum and a width of 35 inches (890 mm) minimum and 37 inches (940 mm) maximum.

604.8.2.2 Doors. Toilet compartment doors, including door hardware, shall comply with 404, except that if the approach is to the latch side of the compartment door, clearance between the door side of the compartment and any obstruction shall be 42 inches (1065 mm) minimum. The door shall be self-closing. A door pull complying with 404.2.7 shall be placed on both sides of the door near the latch. Toilet compartment doors shall not swing into the minimum required compartment area.

604.8.2.3 Grab Bars. Grab bars shall comply with 609. A side-wall grab bar complying with 604.5.1 shall be provided on both sides of the compartment.

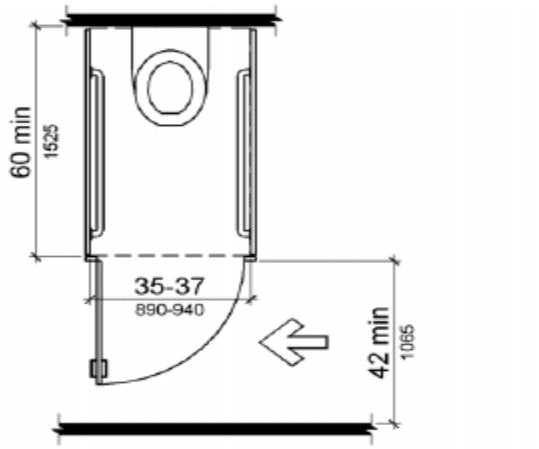


Figure 604.8.2 Ambulatory Accessible Toilet Compartment

604.8.3 Coat Hooks and Shelves. Coat hooks shall be located within one of the reach ranges specified in 308. Shelves shall be located 40 inches (1015 mm) minimum and 48 inches (1220 mm) maximum above the finish floor.

608.6 Shower Spray Unit and Water. A shower spray unit with a hose 59 inches (1500 mm) long minimum that can be used both as a fixed-position shower head and as a hand-held shower shall be provided. The shower spray unit shall have an on/off control with a non-positive shut-off. If an adjustable-height shower head on a vertical bar is used, the bar shall be installed so as not to obstruct the use of grab bars. Shower spray units shall deliver water that is 120°F (49°C) maximum.

EXCEPTION: A fixed shower head located at 48 inches (1220 mm) maximum above the shower finish floor shall be permitted instead of a hand-held spray unit in facilities that are not medical care facilities, long-term care facilities, transient lodging guest rooms, or residential dwelling units.

Advisory 608.6 Shower Spray Unit and Water. Ensure that hand-held shower spray units are capable of delivering water pressure substantially equivalent to fixed shower heads.

609 Grab Bars

609.1 General. Grab bars in toilet facilities and bathing facilities shall comply with 609.

609.2 Cross Section. Grab bars shall have a cross section complying with 609.2.1 or 609.2.2.

609.2.1 Circular Cross Section. Grab bars with circular cross sections shall have an outside diameter of 1 1/4 inches (32 mm) minimum and 2 inches (51 mm) maximum.
609.2.2 Non-Circular Cross Section. Grab bars with non-circular cross sections shall have a cross-section dimension of 2 inches (51 mm) maximum and a perimeter dimension of 4 inches (100 mm) minimum and 4.8 inches (120 mm) maximum.

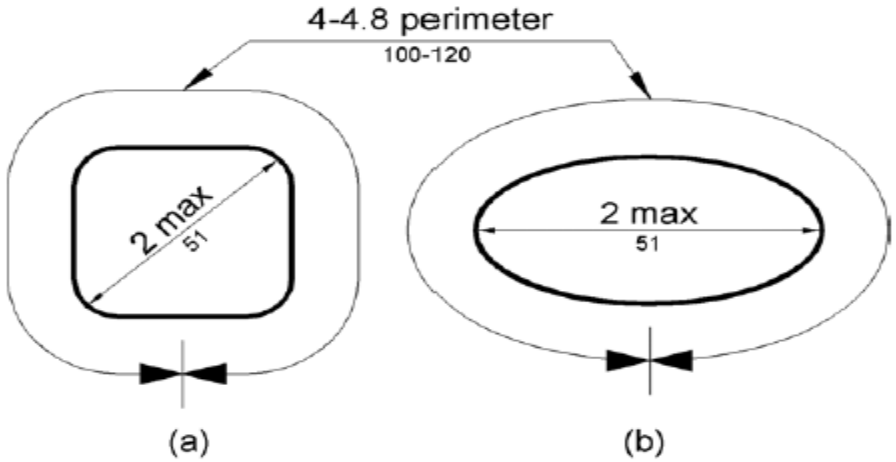


Figure 609.2.2 Grab Bar Non-Circular Cross Section

609.3 Spacing. The space between the wall and the grab bar shall be 1 1/2 inches (38 mm). The space between the grab bar and projecting objects below and at the ends shall be 1 1/2 inches (38 mm) minimum. The space between the grab bar and projecting objects above shall be 12 inches (305 mm) minimum.
EXCEPTION: The space between the grab bars and shower controls, shower fittings, and other grab bars above shall be permitted to be 1 1/2 inches (38 mm) minimum.

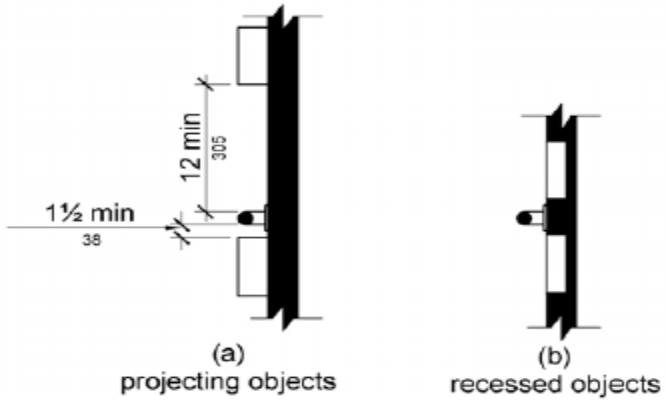


Figure 609.3 Spacing of Grab Bars

609.4 Position of Grab Bars. Grab bars shall be installed in a horizontal position, 33 inches (840 mm) minimum and 36 inches (915 mm) maximum above the finish floor measured to the top of the gripping surface, except that at water closets for children's use complying with 604.9, grab bars shall be installed in a horizontal position 18 inches (455 mm) minimum and 27 inches (685 mm) maximum above the finish floor measured to the top of the gripping surface. The height of the lower grab bar on the back wall of a bathtub shall comply with 607.4.1.1 or 607.4.2.1.

609.5 Surface Hazards. Grab bars and any wall or other surfaces adjacent to grab bars shall be free of sharp or abrasive elements and shall have rounded edges.

609.6 Fittings. Grab bars shall not rotate within their fittings.

609.7 Installation. Grab bars shall be installed in any manner that provides a gripping surface at the specified locations and that does not obstruct the required clear floor space.

609.8 Structural Strength. Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the grab bar, fastener, mounting device, or supporting structure.

SIGNAGE

F216 Signs

703.7 Symbols of Accessibility. Symbols of accessibility shall comply with 703.7.

703.7.1 Finish and Contrast. Symbols of accessibility and their background shall have a non-glare finish. Symbols of accessibility shall contrast with their background with either a light symbol on a dark background or a dark symbol on a light background.

Advisory 703.7.1 Finish and Contrast. Signs are more legible for persons with low vision when characters contrast as much as possible with their background. Additional factors affecting the ease with which the text can be distinguished from its background include shadows cast by lighting sources, surface glare, and the uniformity of the text and background colors and textures.

703.7.2 Symbols.

703.7.2.1 International Symbol of Accessibility. The International Symbol of Accessibility shall comply with Figure 703.7.2.1.

Figure 703.7.2.1 International Symbol of Accessibility

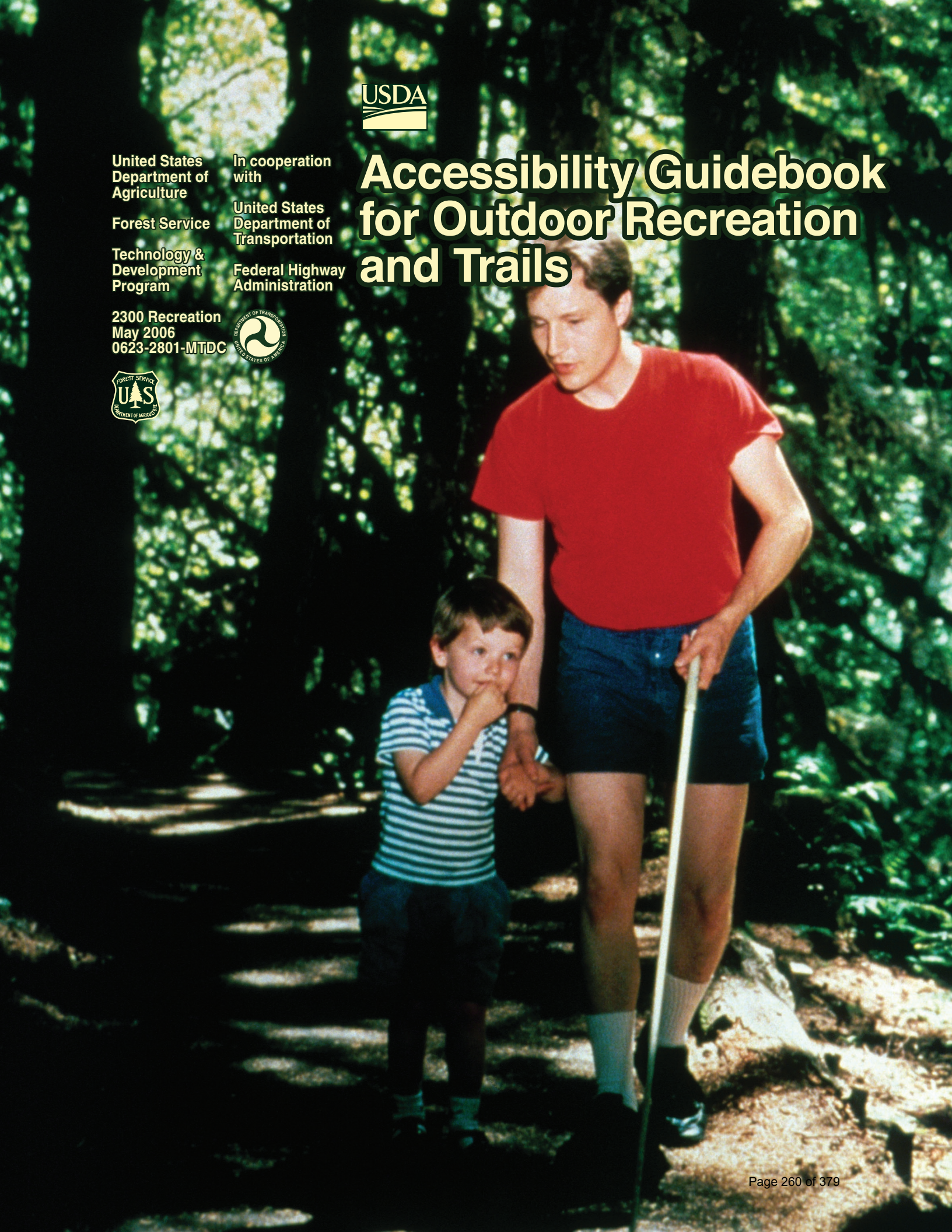
Elements and spaces of accessible facilities that shall be identified by the International Symbol of Accessibility:

- Accessible parking spaces in parking lots with designated parking spaces (F216.5)
  where there are 5 or more parking spaces, including accessible parking spaces, on a site. (F216.5.1)
  - No ISA at parking spurs provided at camping unit
- Accessible loading zone (F 216.8) Accessible restrooms and bathing facilities.(F216.8)
- If the main entrance to a building is not accessible, the ISA and an arrow are to be posted to direct to closest accessible. (F216.6)
- Accessible Area of Refuge inside multi story buildings (F216.4.2)
- Accessible means of egress out of a building (F216.4.3)

Great Trinity Forest Management Plan

RECREATION

Accessibility Guidebook for Outdoor Recreation and Trails



USDA

Accessibility Guidebook for Outdoor Recreation and Trails

United States Department of Agriculture

Forest Service

Technology & Development Program

2300 Recreation
May 2006
0623-2801-MTDC

In cooperation with

United States Department of Transportation

Federal Highway Administration

Cover photo—A father and son enjoy a hike in the woods on an accessible trail.

Accessibility Guidebook for Outdoor Recreation and Trails

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Accessibility Program Manager

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Project Leader

USDA Forest Service
Technology and Development Program
Missoula, MT

4E42A85—FHWA Accessible Facility and Program Guidebook

May 2006

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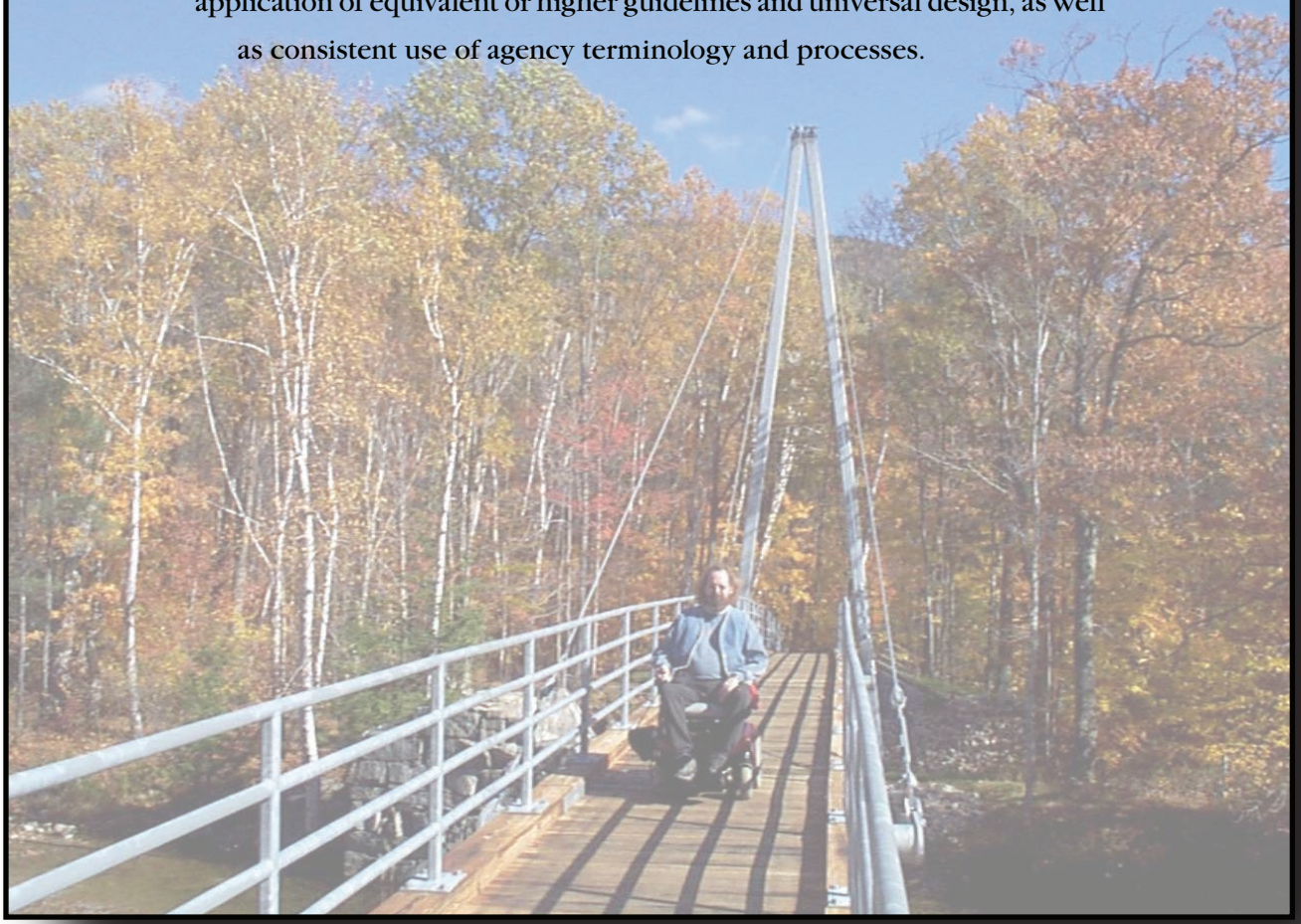
Contents

This document is intended to help Forest Service personnel apply the Forest Service Outdoor Recreation Accessibility Guidelines and Forest Service Trail Accessibility Guidelines. These guidelines only apply within National Forest System boundaries. Both are based on the draft accessibility guidelines for outdoor developed areas created by the Architectural and Transportation Barriers Compliance Board (Access Board).

When the Access Board finalizes its accessibility guidelines for outdoor developed areas, the Forest Service will revise the Forest Service Outdoor Recreation Accessibility Guidelines and the Forest Service Trail Accessibility Guidelines to incorporate the Access Board's standards, where those provisions are a higher standard, as supplemented by the Forest Service. The supplementation will ensure the agency's application of equivalent or higher guidelines and universal design, as well as consistent use of agency terminology and processes.



Introduction

Lots of directives, letters, and books on accessibility have been written. A new batch appears every time guidelines or policies change.

This guidebook is intended to help designers and recreation professionals apply the Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG) and Forest Service Trail Accessibility Guidelines (FSTAG). These guidelines only apply on National Forest System lands. While they are official policy only for the U.S. Department of Agriculture (USDA) Forest Service, they contain useful concepts to help other agencies and organizations develop accessible outdoor recreation and accessible trails.

Once managers and designers understand what is needed, accessibility becomes integrated into the thinking, planning, designing, construction, and maintenance of every project, rather than being an afterthought. That's the way we need to do business, and that's why this guidebook was written.

Coordination among Forest Service employees and with volunteer partners will be essential to successfully implementing the FSORAG and FSTAG. The Forest Service is committed to helping ensure that the FSORAG and FSTAG are implemented.

Both the FSORAG and the FSTAG are based on the draft accessibility guidelines for outdoor developed areas created by the Architectural and Transportation Barriers Compliance Board (Access Board). The Forest Service and other Federal agencies will work with the Access Board as it develops final accessibility guidelines for outdoor developed areas. When the Access Board finalizes its accessibility guidelines for outdoor developed areas, the Forest Service will revise the Forest Service Outdoor Recreation Accessibility Guidelines and the Forest Service Trail Accessibility Guidelines to incorporate the Access Board's standards, where those provisions are a higher standard, as supplemented by the Forest Service. The supplementation will ensure the agency's application of equivalent or higher guidelines and universal design, as well as consistent use of agency terminology and processes. Once the guidelines are final, any changes that are needed will be made to this guidebook and it will be reissued.

The Outdoors Are for Everyone—Fundamentals of Outdoor Recreation and Trails Accessibility

It's all about people having the opportunity to enjoy the outdoors. Public lands offer a wide range of recreation settings and opportunities from highly developed campgrounds to untouched wilderness areas.

Why Accessibility Is Important

The Forest Service is committed to integrating accessibility into the complete range of recreation opportunities while protecting natural resources and settings so that all people, including people who have disabilities, have the opportunity to enjoy the great outdoors. This commitment is established in Forest Service policy. Visitors have the right to choose both the type of recreation they want to pursue and the setting in which to pursue it. Of course, recreationists must always check to make sure that what they want to do is allowed.

How does accessibility fit into this range of opportunities? We certainly don't want to pave the wilderness. However, when the decision is made to construct or alter a building, trail, or other facility, we must ask, "Will a person with a disability have an equal opportunity to use this facility?" The key is to ask this question before the facility has been designed and built. Then we can provide facilities for use by all people, including people with disabilities.

How many people benefit from accessible facilities? At the time of the 2000 census, 54 million people, or one in every five people in the United States, had a disability that significantly limited one or more major life activities such as walking, seeing, hearing, breathing, thinking, and so forth. Of that number, 4 percent used wheelchairs and 7.4 percent used crutches, canes, walkers, or other assistive devices.

Additionally, the population of the United States is aging. By the year 2030, 110 million people will be older than 55. As people age, impairments are more likely to hinder activities. There's a lot of truth to the saying that if you live long enough, you are sure to join the ranks of people with disabilities.

Recreation Opportunities on National Forests and Grasslands

- National forests and grasslands are in all but six of the United States and in Puerto Rico and the Virgin Islands.
  - —175 national forests and grasslands
  - —192 million acres (77.7 million hectares) to enjoy
- 406 congressionally designated wilderness areas
  - —35.2 million acres (14.2 million hectares) in which to experience solitude and a pristine environment
- 95 wild and scenic rivers
  - —4,418 miles (7,110 kilometers) of beautiful water to float or fish
- 133,000 miles (214,000 kilometers) of trails to hike
- 23,000 recreation sites
  - —4,300 campgrounds in which to pitch a tent or set up a trailer or recreational vehicle
- Thousands of miles (or kilometers) of scenic byways to drive
- 205 million visits each year

For more information on Forest Service recreation opportunities, visit *http://www.fs.fed.us/recreation/*.

If anyone in a group has a disability, accessibility is an issue for the whole group, as shown in figure 1. It influences where the group can go and what they can do. Ski areas learned many years ago that each skier who has a disability is usually accompanied by three or four additional skiers who don't have disabilities. They all want to buy lift tickets, rent gear, eat lunch, and ski together. Accessibility is good customer service and good for business.

Figure 1—Although the Blackberry Crossing Campground in the White Mountain National Forest is not highly developed, it's a great place for this group of friends to enjoy camping together.

Just as recreational preferences vary among the general population, people with disabilities enjoy different types of outdoor recreation. We must make sure that facilities allow all visitors, including people with disabilities, to choose their own recreational activities.

What Terms Should Be Used?

Although people who have disabilities refer to themselves in many different ways, as an agency we must ensure that the terminology we use complies with legal direction and is considered acceptable by the majority of people. Numerous "buzz words" have been used to describe people with disabilities over the years. The good news is that the terminology question was settled in the early 1990s. The 1990 Americans with Disabilities Act (ADA) uses the terms ***persons with disabilities*** and ***accessible***. In 1992, when Section 504 of the Rehabilitation Act was renewed and amended, its terminology was corrected to include just the terms *accessible* and *persons with disabilities*. Also in 1992, Federal agencies were directed to correct terminology in their regulations, policies, and other documents to match the Rehabilitation Act and ADA terminology.

A disability is a medically definable condition that causes a limitation in one or more of a person's major life activities such as walking, seeing, hearing, speaking, breathing, thinking, and so forth. Person-first terminology is used because the person is more important than his or her disability. Examples of person-first terminology include:

- *A person who is blind*—**not** *a blind person*
- *A person who uses a wheelchair*—**not** *a wheelchair-bound person* or *a wheelchair person*

A handicap is a barrier or circumstance that makes progress or success difficult, such as a flight of stairs that may be impassable for a person using a wheelchair or a negative attitude toward a person who has a disability. The term *handicapped* has negative connotations. The word has been around for centuries, but wasn't used to refer to people with disabilities until the late 1800s. Many people believe that the term "handicapped" was first used in relation to persons with disabilities when Civil War veterans whose injuries prevented them from working were begging on the streets with "cap in hand." Standard references do not support this story. But because the story has become legend and begging for a living is degrading, describing people with disabilities as *handicapped* is offensive to most people with disabilities. It may be useful to think of handicapped as the *H* word and eliminate it from your vocabulary, publications, and other materials.

Disability Etiquette

- Use common sense and extend common courtesy to everyone.
- Don't patronize anyone; treat adults like adults.
- Be patient. Some people need more time to express themselves or move about.
- Relax and be yourself. It's okay to use common phrases such as "See you later" when talking with a person who is blind or has limited vision.
- Speak directly to the person and maintain eye contact, don't speak through a companion or interpreter.
- Use person-first language. Don't use words like handicapped, victim, or afflicted to describe a person who has a disability.
- Offer assistance to persons with disabilities and follow their specific directions.
- Do not pet, feed, or distract service animals without first asking permission—they are working animals, not pets.

Figure 2—Two friends enjoy an accessible trail that allows them to hike through the rain forest.

Accessible facilities comply with the accessibility guidelines and standards. A site, facility, or program is either accessible or it is not accessible. The only way to evaluate accessibility is to evaluate the facility's compliance with the guidelines in effect at the time it was designed, constructed, or altered. There are no shades of accessibility. For instance, a parking space either complies with the standards and is accessible, or it doesn't comply with the standards and is not accessible. The specific technical provisions of the standards for surfacing, slope, and the size of the parking space and walkway connection must be met, regardless of the conditions around the parking space. *Almost* doesn't count. For instance, figure 2 illustrates one type of trail that complies with accessibility guidelines.

Other terms concerning accessibility that are incorrect include *partially accessible*, *accessible with assistance*, *barrier free*, *ADA accessible*, and *handicapped accessible*. The first two terms are incorrect because a facility is either accessible or it is not accessible. If the facility is not accessible, the visitor or employee needs to know which specific areas are not accessible. *Partially accessible* and *accessible with assistance* imply some accessibility problems, but don't provide enough information to be helpful. *Barrier free* isn't legally defined or commonly understood. *ADA accessible* confuses laws with accessibility standards. Although *handicapped accessible* is a common phrase, it includes the *H* word that many people with disabilities find offensive. *Handicapped accessible* also is a contradiction in terms because a handicap is a barrier and the term *accessible* means there aren't any barriers. The best terms are simply *accessible* and *not accessible*.

The Law Requires Accessibility

The ***Architectural Barriers Act*** (ABA) (*http://www.access-board.gov/about/laws/ABA.htm*) became law in 1968. The act mandates that all facilities built, purchased, rented, altered, or leased by, for, or on behalf of a Federal agency must be accessible.

In 1973, the ***Rehabilitation Act*** became law. Section 504 (*http://www.access-board.gov/enforcement/Rehab-Act-text/title5.htm*) of the act applies to programs and activities that are conducted by Federal agencies and by entities that receive funding from, or operate under a permit from, Federal agencies. Section 504 requires that these programs and activities provide an equal opportunity for individuals with disabilities to participate in an integrated setting, as independently as possible. The only exception to the requirement is when the program would be fundamentally altered if changes were made solely for the purpose of accessibility. An example of a fundamental alteration to a program would be allowing use of a motor vehicle in an area not designated for motor-vehicle use.

The USDA implementation guideline for Section 504 is ***7 CFR 15***, which was finalized in 1994. Part 15e (*http://www.access.gpo.gov/nara/cfr/waisidx_03/7cfr15e_03.html*) applies to programs conducted by the Forest Service. Subpart 15b (*http://www.access.gpo.gov/nara/cfr/waisidx_03/7cfr15b_03.html*) applies to programs operating with Federal agency funding, under special use permits, or under other agreements with the agency. If a building or structure must be entered for someone to participate in the activity at the site, the building must be accessible.

The ***Americans with Disabilities Act*** (ADA) (*http://www.access-board.gov/about/laws/ADA.htm*) became law in 1990. Except for Title V Section 507c, the ADA doesn't apply to Federal agencies' facilities and programs. They were already required to be accessible under the ABA and Section 504 of the Rehabilitation Act. The ADA applies to State and local government services and to public accommodations, such as motels and hotels, and organizations that are open to the public.

Title V Section 507c of the ADA applies to congressionally designated wilderness. It reaffirms the 1964 Wilderness Act and clarifies that agencies aren't required to change the character of wilderness areas to provide accessibility. Section 507c also defines a wheelchair and states that wheelchairs meeting that definition can be used in congressionally designated wilderness.

Universal Design

The best way to integrate accessibility is to use the principles of universal design. Universal design is simply designing programs and facilities to be usable by all people, to the greatest extent possible, without separate or segregated access for people with disabilities (figure 3). Using universal design principles is Forest Service policy, as stated in the Forest Service Manual, Section 2333.33 (*http://www.fs.fed.us/im/directives/fsm/2300/id_2330-2005-2.doc*).

Figure 3—A group of friends enjoy a break during a stroll on a boardwalk through a wet area. The accessible trail makes it possible for the whole group to enjoy the same experience.

Since the early 1990s, the Forest Service has followed the universal design policy that all new and reconstructed facilities, programs, and associated elements are to be accessible to the greatest extent possible. This commitment often exceeds the minimum requirements of the

Federal accessibility guidelines. The result of universal design is independence, integration, and dignity for everyone.

More information on accessibility guidelines is provided in the next chapter.

Program Accessibility

For the purposes of evaluating accessibility, a *program* is an activity in which people may participate. Basically, the program is the reason a person visits an area and may include opportunities such as:

- Camping in a campground
- Viewing the scenery at an overlook (figure 4)
- Swimming at a beach
- Enjoying solitude in the wilderness
- Gathering information at a visitor center
- Learning about an area on an interpretive trail

The 1994 USDA regulations—7 CFR 15e (*http://www.access.gpo.gov/nara/cfr/waisidx_03/7cfr15e_03.html*) and 15b (*http://www.access.gpo.gov/nara/cfr/waisidx_03/7cfr15b_03.html*) govern the USDA implementation of Section 504 of the Rehabilitation Act. They prescribe the requirements for ensuring access to programs.

If a program is provided inside a building or structure, everyone, including people with disabilities, must be able to enter the facility to participate in the program. Unfortunately, some older structures are not yet accessible, and a few cannot be made accessible because doing so would destroy their historic integrity. If a facility is not accessible, the program must be provided in another manner, called an alternative program. All alternative programs must allow everyone to participate together. Separate, segregated programs just for people with disabilities aren't permitted. For example, if an evening program at a campground previously has been held in an amphitheater that isn't accessible, the program must be moved to an accessible location until the amphitheater is accessible.

Figure 4—Interpretation is for everyone. Signs must be placed so that everyone can see and understand them.

Under Section 504 of the Rehabilitation Act and 7 CFR 15, access to programs that don't depend on constructed facilities also are required to provide "equal opportunity" to all. That means that a person with a disability cannot be denied the opportunity to participate in a program that is open to everyone. To participate, any person, with or without a disability, must meet the criteria for the program and abide by any restrictions, including those of the Forest Land Management Plan, for that program in that area. While people with and without disabilities are to have an equal opportunity to participate in programs and to strive to gain the same benefits offered by those programs, no guarantee of success is required.

The laws require equal opportunity; they don't require exceptional opportunity. For example, roads, trails, or other areas on national forests and grasslands that are not designated for motor-vehicle use under a forest travel management plan are closed to all motor vehicles, including those used by people with disabilities.

Access to programs must be viewed through the lens of the entire program, not through the eyes of an individual. Access to the program is to be provided so long as doing so doesn't "fundamentally alter" the program. That is, providing access doesn't change the primary functions of the program. Allowing motorized vehicles in a non-motorized area would be a fundamental alteration of the recreational program for that area.

People ask, "What about reasonable accommodation?" The laws are clear. Reasonable accommodation, which means doing whatever each individual needs to be able to fulfill the functions of a job, despite any disability, only applies in employment. It does not apply to recreation facilities and trails. The laws also are clear that when it comes to program access, the overall program is the focus. Criteria to participate in that program must be the same for all participants.

Questions often arise concerning the use of wheelchairs in areas that restrict or prohibit mechanical devices or motorized use. As clarified in Title V Section 507, the *Federal Wilderness Areas* section of the Americans with Disabilities Act, the legal definition of a wheelchair is:

> *A device designed solely for use by a mobility-impaired person for locomotion, that is suitable for use in an indoor pedestrian area.*

"Designed solely for use by a mobility-impaired person for locomotion," means that the wheelchair was originally designed and manufactured solely for use for mobility by a person with a disability. This term doesn't include the aftermarket retrofit of a motorized unit to make it usable by a person with a disability. "Suitable for use in an indoor pedestrian area" means usable inside a home, mall, courthouse, or other indoor pedestrian area. Figures 5 through 9 show some examples of devices that are wheelchairs and one that is not.

Figure 5.

Figure 6.

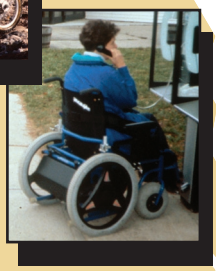


Figure 7.

Figure 8.

Figure 9.

Figures 5 to 9—Although figures 5 to 8 show wheelchairs, figure 9 shows a device that is not a wheelchair. Many wheelchairs look different from those shown. The only sure way to determine if a device is a wheelchair is to answer the two key questions described in the text.

To determine whether a device meets the definition of a wheelchair, evaluate it against the two sections of the definition. Ask yourself the following questions:

1—Was the device designed solely for mobility by a person with a disability?
If ***no***, the device doesn't meet the definition and doesn't qualify for use as a wheelchair.
If ***yes***, ask the second question:

2—Is it suitable for use in an indoor pedestrian area? Consider whether it could be used in a mall, courthouse, or similar area without the security personnel directing the user to leave.
If ***no***, the device doesn't meet the definition and doesn't qualify for use as a wheelchair.
If the answer to both questions is ***yes***, the device meets the definition of a wheelchair and can be used wherever foot travel is permitted.

A person whose disability requires use of a wheelchair or assistive device may use a wheelchair that meets the definition above anywhere foot travel is permitted, in accordance with Title V, Section 507c, of the ADA (36 CFR 212.1) and the Forest Service Manual 2353.05. Wheelchairs or assistive devices, including battery-powered wheelchairs, aren't categorized as motorized vehicles or mechanical devices.

Transition Plans

Since the 1968 passage of the ABA, facilities designed, built, bought, rented, altered, or leased by, for, or on behalf of a Federal agency are required to be accessible. Unfortunately, some Federal facilities are not yet accessible.

To correct this problem, in the early 1990s the Forest Service called for all units to complete transition plans identifying the changes needed to make each facility accessible and the timeline for completing the changes. Funding to complete the transition plans was provided to the regions in 1991, 1992, and 1993.

The accessibility regulation for the programs of all USDA agencies, 7 CFR 15e, was finalized in December 1994. This regulation required transition plans to be completed by December 31, 1997. 7 CFR 15e Section 150 (d) (*http://www.access.gpo.gov/nara/cfr/waisidx_03/7cfr15e_03.html*) details the specific requirements for transition plans and their contents.

In 1998, under Public Law 105-359, Congress mandated an evaluation of accessibility to outdoor recreation on federally managed lands for both the United States Department of Agriculture and Department of the Interior agencies. The results of the independent study that

TERMINOLOGY TIP—
Wheelchairs are not motor vehicles.

36 CFR 212.1 defines a motor vehicle as any vehicle that is self-propelled, other than:

- A vehicle operated on rails.
- Any wheelchair or mobility device, including one that is battery powered, that is designed solely for use by a mobility-impaired person for locomotion, and that is suitable for use in an indoor pedestrian area.

Wheelchairs that meet this legal definition may be used anywhere foot travel is allowed.

was published in June 2000 highlighted to Congress that many Forest Service and other Federal agency units still had not completed their transition plans. The attention resulting from the report increased the pressure on Federal agencies to get the plans completed. To keep units focused on completing this work, the Forest Service national budget direction each year since 2001 has included direction to the field to complete the transition plans.

Program Accessibility: Existing Facilities (7 CFR 15e Section 150) allows a program to be "viewed in its entirety" when accessibility is evaluated. However, a transition plan must be developed and implemented for any program that is not accessible because the facility housing the program is not accessible.

No standardized format has been provided for transition plans. Each region and some national forests developed their own transition plan format. Check with your agency's accessibility coordinator, your regional recreation accessibility coordinator (RRAC) (*http://fsweb.mtdc.wo.fs.fed.us/toolbox/acc/documents/coord.htm*) or your region/station facilities program leader (*http://fsweb.wo.fs.fed.us/eng/documents/fac_leaders.htm*) to find out whether your local unit has developed a format. If not, request a sample of the formats used by other units. At a minimum, the transition plan must include:

- A list of obstacles to accessing the facility and program as identified in the accessibility evaluation survey
- A detailed description of the methods that will be used to provide accessibility
- The schedule for implementing the plan, including the actions that will be taken each year if the work takes more than a year
- The signature of the official responsible for implementation of the transition plan

Transition plans must be available to the public.

Accessibility Evaluation Surveys

An accessibility evaluation survey is the first step in developing a transition plan. During the survey, each portion of a structure is compared to the accessibility standards, and compliance and deficiencies are recorded.

For example, doorways must be checked to see whether they have at least 32 inches (815 millimeters) of clear width. Measure clearance when a swinging door is open 90 degrees and when the door is fully opened for other types of doors. Stretch the measuring tape from the face of the open door to the nearest portion of the doorframe or latch mechanism on the latch side (figure 10).

Figure 10—All doorways must have a minimum of 32 inches (813 millimeters) clear width.

Two checklists on the Internet can be used as accessibility evaluation guides for facilities: the *Uniform Federal Accessibility Standards Checklist* (*http://www.access-board.gov/ufas/UFAS checklist.txt*) and the *ADA Accessibility Guidelines Checklist for Buildings and Facilities* (*http://www.access-board.gov/adaag/checklist/a16.html*). However, your local unit may have developed checklists that will better match your facilities. Check with your agency's accessibility coordinator, your regional recreation accessibility coordinator (*http://fsweb.mtdc.wo.fs.fed.us/toolbox/acc/documents/coord.htm*), or your region/station facilities program leader (*http://fsweb.wo.fs.fed.us/eng/documents/fac_leaders.htm*) for more information.

So Many Guidelines, So Little Time—Applying Accessibility Guidelines to Your Site

How did we end up with so many accessibility guidelines and standards? Which guidelines and standards apply to your site? The following information will demystify accessibility guidelines and standards.

The History of Accessibility Guidelines

As explained in the previous chapter, accessibility laws have been enacted and updated since 1968. Here is a brief history of the guidelines for buildings:

• **American National Standards Institute (ANSI)—1969 to 1980.** The first accessibility guidelines used by Federal agencies under the Architectural Barriers Act (ABA).

• **General Services Administration Accessibility Guidelines—1980 to 1984.** The General Services Administration (GSA) developed its own set of guidelines for all buildings other than those of the Department of Housing and Urban Development, the Department of Defense, or the U.S. Postal Service. Those agencies developed their own guidelines.

• **Uniform Federal Accessibility Standards (UFAS)—1984 to 2006.** These standards updated and expanded the General Services Administration Accessibility Guidelines. The standards were adopted under the ABA, and apply to all federally funded facilities, unless there is a higher standard of accessibility for that type of structure required by other legal standards or guidelines.

• **Americans with Disabilities Act Accessibility Guidelines (ADAAG)—1991 to 2004.** The ADAAG explains how to apply the Americans with Disabilities Act (ADA) of 1990 in the built environment. These guidelines apply to services provided by State and local governments, and public accommodations, such as motels and hotels.

Current Accessibility Guidelines

In 2004, the Architectural and Transportation Barriers Compliance Board (Access Board) finished updating and merging the UFAS and ADA accessibility guidelines. The combined *Americans with Disabilities Act/Architectural Barriers Act Accessibility Guidelines* are available at: *http://www.access-board.gov/ada-aba/*.

These guidelines apply to all Federal, State, and local government facilities and to public accommodations. In November 2005, the General Services Administration, the standard-setting agency for Forest Service facilities, adopted the ABA portion of the combined guidelines. The Architectural Barriers Act Accessibility Standard (ABAAS) is the name given by the GSA to the standards the Forest Service must follow. The ABAAS became effective on May 8, 2006.

Chapter 1: Explains when, where, and how many of each component must be accessible (scoping) for all entities under the ADA, including State and local government services and public accommodations.

Chapter 2: Explains when, where, and how many of each component must be accessible (scoping) for all entities under the ABA, including facilities that are built, bought, rented, or leased by, for, or on behalf of a Federal agency. The numbering for these scoping provisions begins with the letter *F* as a friendly reminder that they apply to federally related facilities.

Chapters 3 through 10: These chapters contain technical provisions that apply to entities governed by both the ADA and the ABA.

The Access Board is an independent Federal agency devoted to accessibility for people with disabilities. It operates with about 30 staff and a governing board of representatives from Federal departments and public members appointed by the President. Key responsibilities of the board include:

- Developing and maintaining accessibility requirements for the built environment, transit vehicles, telecommunications equipment, and for electronic and information technology

- Providing technical assistance and training on these guidelines and standards

- Enforcing accessibility standards for federally funded facilities

The Access Board developed the guidelines to serve as the basis for enforceable standards issued by four standard-setting agencies: the Department of Defense (DOD), the General Services Administration (GSA), the Department of Housing and Urban Development (HUD), and the U.S. Postal Service (USPS). The USDA and the Forest Service follow standards (the ABAAS) set by the GSA.

The Forest Service guidelines for outdoor elements and trails don't change an agency's responsibility to comply with the ABAAS. Agencies must comply with the ABAAS when designing or constructing any facility or component addressed by those standards. Drinking fountains, plumbed toilet facilities, parking lots and spaces, and cabins are among the components covered by the ABAAS.

Accessibility Guidelines Under Development

The Access Board (*http://www.access-board.gov/*) is developing accessibility guidelines that will apply to special situations, such as passenger vessels, outdoor developed areas, and public rights-of-way. They will be chapters of the ABAAS when they become final.

The ***public rights-of-way accessibility guidelines*** (*http://www.access-board.gov/news/prowac/*) will cover access to sidewalks and streets, including crosswalks, curb ramps, street furnishings, parking, and other components of public rights-of-way. These draft guidelines were proposed and submitted for comment during 2002.

Guidelines for the Outdoor Environment

All of the guidelines and standards listed above, including the ABAAS, focus on facilities in highly developed areas, such as cities, towns, and major tourist attractions. With the exception of boating facilities and fishing piers and platforms, they don't provide direction for the construction or renovation of outdoor recreation areas and trails managed for hiker or pedestrian use.

In 1993, the Forest Service developed *Universal Access to Outdoor Recreation: A Design Guide* (called the Design Guide), which integrated the principles of universal design into all recreation settings. The Access Board also recognized the need for guidelines focused on outdoor recreation and formed a regulatory negotiation committee in 1997 to address the issue. The Forest Service was among the agencies and interest groups represented on the committee. The committee developed draft accessibility guidelines for outdoor developed areas. However, because the Access Board's regulatory negotiation committee's draft guidelines applied to all private, State, and Federal outdoor recreation areas, the rule-making process was delayed. While the draft guidelines were similar to the Forest Service guidelines in the Design Guide, the approach for incorporating accessibility into the outdoor environment differed significantly. In 2000, the Forest Service suspended use of the design guide because it tied accessibility to levels of development identified in the Recreation Opportunity Spectrum.

Because the Access Board's draft guidelines for outdoor recreation have not yet completed the rule-making process, the Forest Service has developed its own guide-

lines based on the Access Board's draft guidelines. These new agency accessibility guidelines for outdoor recreation and trails have completed the required directives process, including public comment. The Forest Service continues to work with the Access Board and other Federal agencies to complete national guidelines for outdoor recreation and trails that will apply to all Federal land management agencies.

When the Access Board finalizes its accessibility guidelines for outdoor developed areas, the Forest Service will revise the Forest Service Outdoor Recreation Accessibility Guidelines and the Forest Service Trail Accessibility Guidelines to incorporate the Access Board's standards, where those provisions are a higher standard, as supplemented by the Forest Service. The supplementation will ensure the agency's application of equivalent or higher guidelines and universal design, as well as consistent use of agency terminology and processes.

The ***Forest Service Outdoor Recreation Accessibility Guidelines*** (FSORAG) apply to newly constructed and reconstructed camping facilities, picnic areas, beach access, outdoor recreation access routes (ORARs), and other constructed recreation features, such as picnic tables, benches, trash and recycling containers, viewing areas at overlooks, telescopes or periscopes, storage for assistive devices, remote area pit toilets, warming huts, outdoor rinsing showers, and so forth. These guidelines apply only within National Forest System boundaries. The entire text of the FSORAG is in the *Resources* section at the end of this guidebook.

The ***Forest Service Trail Accessibility Guidelines*** (FSTAG) apply to new or altered trails that are designed for hiker and pedestrian use and that connect either directly to a trailhead or to an accessible trail. These guidelines apply only within National Forest System boundaries. The entire text of the FSTAG is in the *Resources* section at the end of this guidebook.

Table 1 is a simplified overview of the application of the ABAAS, FSORAG, and FSTAG.

Table 1—Accessibility guidelines quick guide (which guideline applies where).

ABA Accessibility Standards	Apply only within National Forest System boundaries	
	FSORAG	FSTAG
BUILDINGS, BOATING AND FISHING	**RECREATION SITE FEATURES**	**HIKER/PEDESTRIAN TRAILS**
All buildings, including: • Administrative offices • Residences • Crew quarters • Visitor centers • Entrance stations • Parking lots **And including components, such as:** • Restrooms with and without running water • Workstations • Doors • Operating controls (door handles, faucets controls, thermostats, and so forth) **Boating and fishing facilities, including:** • Boating facilities • Docks • Fishing piers and platforms	**New or reconstructed:** • Picnic areas • Picnic tables • Fire rings • Cooking surfaces • Grills • Pedestal grills • Wood stoves • Fireplaces • Benches • Beach access • Outdoor recreation access routes • Camping units (eating and cooking areas, parking spurs, platforms, tent pads • Campground utility connections • Water hydrants and drinking fountains • Outdoor rinsing showers • Remote-area pit toilets • Trash/recycling containers • Viewing areas and overlooks • Telescopes and periscopes • Mobility device storage • Warming huts	**New or altered trails that are:** • Designed for hiker/pedestrian use and • That connect either directly to a trailhead or • Connect to a currently accessible trail

What If the Guidelines Appear to Conflict With Each Other?

It may appear that some accessibility guidelines conflict with other guidelines or codes, or with the realities of the outdoor environment. Railings must be high enough to protect visitors from a dropoff, but railings that high might limit the viewing opportunity for a person using a wheelchair, so which requirement takes priority? Trash receptacles are supposed to be accessible so that everyone can use them, but then how do we keep bears out? Hand pumps are vital to drawing water in campgrounds where the water system isn't pressurized, but operating the long handle of the traditional pump requires more force and a longer reach than allowed by accessibility requirements. Roads that have restrictions or closures to use by motorized vehicles may be open to foot travel, so how can a road be gated or bermed to keep out vehicles but still allow access by a person using a wheelchair? When you are faced with these types of situations, stop and think carefully about the issues. The solution always

comes back to ensuring safety, abiding by the regulations, and doing so in a manner that includes the needs of all people.

Railings and Safety: Accessibility never supersedes the requirements for safety. This issue most commonly arises at overlook areas, on viewing structures, and in similar locations. For safety, the International Building Code (IBC) (*http://www.iccsafe.org/*) section 1003.2.12 contains requirements for guardrail height and the spacing of rails at dropoffs. This requirement provides opportunities for creative design and for managers and designers to think seriously about the level of development that is appropriate for the setting. The creativity challenge is to provide safety when designing the railing or structure adjacent to the dropoff, while maximizing viewing opportunities. Methods of solving this challenge are discussed in *Viewing Areas at Overlooks*.

TERMINOLOGY TIP—

What's the difference between a guardrail, a handrail, and a grab bar?

The following explanations of terms are based on the use of these terms in the International Building Code and the Architectural Barriers Act Accessibility Standards. Keeping these explanations in mind and using them as they are used in the codes, standards, and guidelines will help everyone communicate more effectively.

Guardrails protect people from dropoffs higher than 30 inches (760 millimeters). Guardrails must be at least 42 inches (1,065 millimeters) high. If the guardrail has openings that are less than 34 inches (865 millimeters) above the walking surface, they must be small enough to prevent a 4-inch (100-millimeter) sphere from passing through them (figure 11).

Continued

Requirements for guardrails are detailed in the International Building Code section 1003.2.12.

Handrails provide a steady support for persons who are going up or down stairs or inclines. Handrails must be between 34 inches (865 millimeters) and 38 inches (965 millimeters) above the walking surface and be easy to grip. Details about acceptable configurations for handrails are provided in the International Building Code section 1003.3.3.11 and in the Architectural Barriers Act Accessibility Standards section 505.

Grab bars provide stability and allow people to use their arms to help them move short distances. The most common location for grab bars is in restrooms. The required locations of grab bars are explained in the Architectural Barriers Act Accessibility Standards chapter 6. Details about grab bar configuration and attachment are provided in the Architectural Barriers Act Accessibility Standards section 609 and in the International Building Code chapter 11.

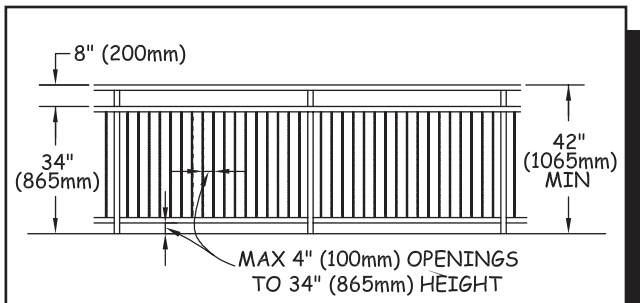


Figure 11—Dimensions required for guardrails.

Reconsidering the **level of development** at a site may be another way to balance safety and accessibility issues. It may not always be appropriate to provide paved paths and interpretive signs. When signs indicate a scenic

viewpoint and a paved pathway begins at the parking lot, visitors are likely to stop, pile out of their vehicle, and head down that pathway, often with the children running ahead. Because of the high level of development at the entrance to the pathway, visitors expect that the viewpoint will have a similar high level of development, including safety features. Development should be consistent at both ends of the pathway.

If the area isn't developed, such as a waterfall in the forest with no signs or constructed trail to it, it may not be appropriate to develop a viewpoint. Some scenic areas should remain natural so that people have the opportunity of adventure and solitude. The safety and accessibility requirements only apply when constructed features are added to the setting.

Safety is also the primary issue when it comes to the accessibility of **trash receptacles**. In bear country, trash and recycling containers must be designed to keep bears out to minimize contacts between bears and humans. Operating controls for these containers require more force than is allowed for accessible operation. Until bear-resistant trash and recycling containers are available that comply with the technical provision for accessible operating controls, recreation areas where bears and other large animals pose a risk to humans are exempt from this provision. Incidentally, dumpsters—the big containers that are mechanically lifted and tipped to empty into commercial garbage trucks—are exempted from accessibility guidelines. More information about trash receptacles is in *Trash, Recycling, and Other Essential Containers*.

Handpumps also have been a concern (figure 12). Because of the piston-like pump mechanism, handpumps require a long reach. As the depth of the well increases, so does the force necessary to draw water, so most hand pumps require a force greater than 5 pounds (2.2 newtons) to operate. The good news is that an accessible handpump has now been developed and is available for purchase. For shallower wells, this pump can draw the water while remaining in full compliance with the grasping, turning, and pressure restrictions of the accessibility guidelines (figure 13). More information about the new

Figure 12—Others used to have to do the pumping.

Figure 13—Now the choice of who does the pumping is up to the campers.

pump is available at: *http://www.fs.fed.us/t-d/programs/eng/handpump.htm* (Username: t-d Password: t-d).

For wells with a static water depth of 50 feet (12 meters) or less, use the accessible handpump for all new installations. Accessible pumps for deeper wells are being developed and should be used when they become available.

When **gates, barriers,** or **berms** are installed on a road to close it to motorized traffic but foot travel is encouraged beyond the closure, people in wheelchairs must be able to get behind the closure, as required by Section 504 of the Rehabilitation Act of 1973. As explained in Program Accessibility, a wheelchair is permitted anywhere foot travel is permitted.

When foot travel is encouraged beyond a closure, the USDA Office of General Counsel has determined that a minimum of 32 inches (815 millimeters) of clear passage must be provided around the gate, berm, or other restrictive device to ensure that a person who uses a wheelchair can participate in the opportunity behind the restriction. This width is the minimum required for a door under the ABAAS. Various methods can provide passage around a restrictive device (figures 14, 15, and 16).

Indications that foot travel has been encouraged include:

- Destination signing
- A pedestrian recreation symbol without a slash
- A Forest Service map that highlights an opportunity behind the closure
- A transportation management objective or recreation management objective stating that pedestrian use is encouraged

In areas where foot travel isn't encouraged, but occasional pedestrian use is allowed before and after installation of the restriction device, individuals who use wheelchairs may raise a concern about access at those restriction devices. In such cases, we must work with the individuals to provide access around the barrier.

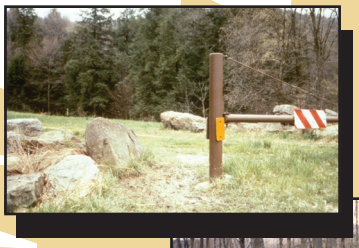


Figure 14.

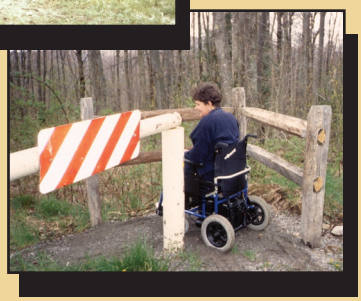


Figure 15.

Figure 16.

Figures 14, 15, and 16—Three ways to get around a road closure gate

All the Rest—Other Important Tools for Accessible Recreation

The following tools work together with the accessibility guidelines when accessible recreation facilities and programs are being developed and managed.

Built Environment Image Guide

The *Built Environment Image Guide* (BEIG) (*http://www.fs.fed.us/recreation/programs/beig/*) provides guidance for improving the image, esthetics, sustainability, and overall quality of the Forest Service's built environment. It emphasizes key elements to showcase the Forest Service's national identity and an image of quality and service. Within eight geographically defined architectural character types, designs project the overall Forest Service image while echoing local values, heritage, and culture. The BEIG's use will lead to an integrated approach to planning and design, including early collaboration among planners, designers, specialists, managers, and maintenance personnel.

Buildings and other constructed features will:

- Fit on the land
- Reflect sensitive site planning and a concern for natural processes
- Harmonize with the local landscape and climate.
- Incorporate the principles of sustainability as an integral part of their architectural character
- Be accessible
- Be durable and low maintenance

The BEIG specifically requires use of universal design principles and points out that if universal design principles are applied to a site or facility design from the outset, they seldom, if ever, have any obvious effect on architectural character. When the principles of universal design are skillfully executed, facilities fit seamlessly within the natural and social environments.

Recreation Opportunity Spectrum

Recreation Opportunity Spectrum (ROS) classifications provide guidance on the:

- Amount of development that is acceptable at any given site
- Amount of deviation from the site's natural characteristics that is appropriate during development
- Types of materials that are appropriate for the setting
- Typical recreation activities in each setting classification (figure 17)

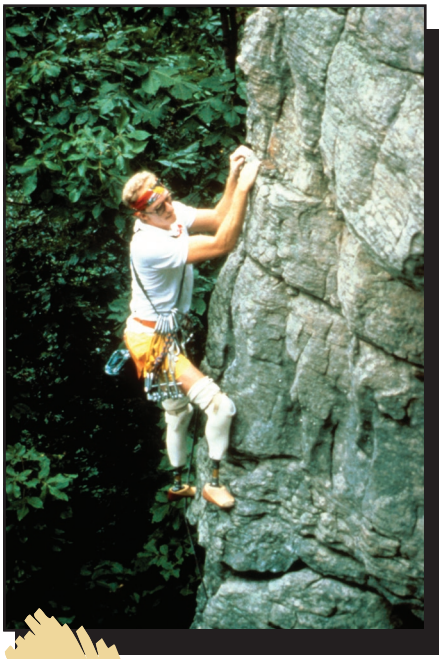


Figure 17—This free climber appears to enjoy the challenge, self-reliance, and independence characteristic of semi-primitive and primitive recreation opportunity spectrum settings.

The spectrum identifies characteristics of Urban, Rural, Roaded Natural, Semi-Primitive Motorized, Semi-Primitive Non-Motorized, and Primitive areas. Some units also include a Roaded Modified classification. Maps should be available at district or supervisor's offices showing the ROS classification for the Forest Service system lands administered by that unit. ROS classifications do not determine accessibility requirements, but should be taken

into account when designing site improvements. For instance, improvements in primitive and semi-primitive settings may sometimes be needed for resource protection. In roaded natural, rural, and urban settings, improvements commonly are provided for visitor comfort and convenience. More information about the ROS is available to Forest Service and Bureau of Land Management employeees at: *http://fsweb.wo.fs.fed.us/eng/facilities/recopp.htm*.

Wilderness Access Decision Tool

Details and implementation guidance for applying Title V Section 507c, the one section of the Americans with Disabilities Act that applies to Federal agencies and to the programs and facilities on federally managed lands can be found at: *http://carhart.wilderness.net/docs/wild_access_decision_tool.pdf*. This decision matrix is designed to assist Federal managers of wilderness areas in making appropriate, objective, and consistent decisions meeting the legal requirement to provide equal opportunity for all individuals, while ensuring there will be no fundamental change to the wilderness experience for all individuals, in accordance with the 1964 Wilderness Act.

Appalachian Trail Conservancy's *Backcountry Sanitation Manual*

This comprehensive manual explains the basic issues of remote area sanitation, including health, esthetics, and regulations, but it focuses on the construction and maintenance of moldering and composting toilets, and includes a case study and design plans. The *Backcountry Sanitation Manual* (*http://www.appalachiantrail.org/protect/steward/sanman.html*) is a cooperative project of the Green Mountain Club and the Appalachian Trail Conference.

> *"Resolving problems of backcountry sanitation is a continuous challenge for trail clubs and land managers. This manual was created in the belief that all remote recreation areas will benefit from an expanded discussion of backcountry sanitation."*—*Pete Antos-Ketcham, Education Coordinator/Facilities Manager, Green Mountain Club*

Accessibility Guidebook for Outfitters/Guides Operating on Public Lands

This guidebook provides a framework to help outfitters and guides who operate under a special-use permit from the Forest Service better serve all visitors (figure 18). The guidebook addresses basic facility accessibility

Figure 18—Outfitters and guides provide the logistics and support for visitors to enjoy a wide range of opportunities on National Forests, including fishing.

issues, but focuses primarily on program and activity accessibility. Outfitters and guides who operate businesses on public lands are governed by the ADA because they are providing public accommodations and are also governed by Section 504 of the Rehabilitation Act because they are operating under special-use permits from Federal agencies. The guidebook identifies legal requirements and provides guidelines, suggestions, and practical tips for complying with both the ADA and Section 504 of the Rehabilitation Act while providing high-quality services. The guidebook is available at: *http://www.fs.fed.us/recreation/programs/accessibility/*.

20 Accessibility Guidebook for Ski Areas Operating on Public Lands

This guidebook provides a framework to help ski areas operating under special-use permits from the Forest Service better serve all visitors (figure 19). The guidebook addresses facility and program accessibility. Ski areas located on public lands are governed by the ADA because they are providing public accommodations and also are governed by Section 504 of the Rehabilitation Act and related regulations, because they are operating under special-use permits from a Federal agency. The guidebook provides the legal mandates, suggestions, and practical tips for complying with laws and regulations, while providing high-quality services. The guidebook is available at: *http://www.fs.fed.us/recreation/programs/accessibility/*.

Figure 19—Ski areas that operate on public land must provide equal opportunity to their services.

Cooperative Publications

The Federal Highway Administration is cooperating with the Forest Service to provide Forest Service publications and videos to the public. Many publications are available at: *http://www.fhwa.dot.gov/environment/fspubs/index.htm* in HTML and PDF (Acrobat) formats. Paper copies can be ordered at: *http://www.fhwa.dot.gov/environment/rectrails/trailpub.htm*.

Standard Forest Service National Trail Specifications

Engineering Management Publication EM–7720–103, *Standard Specifications for Construction and Maintenance of Trails*, provides a uniform set of specifications for contracted trail work throughout the Forest Service. Although these specifications do not address accessibility, they can be used in conjunction with the FSTAG. The publication is available at: *http://www.fs.fed.us/database/acad/dev/trails/trails.htm*.

Trail Construction and Maintenance Notebook

The Missoula Technology and Development Center's Trail Construction and Maintenance Notebook contains

basic trail construction and maintenance information, presented in an easy-to-understand fashion. It is available at: *http://www.fhwa.dot.gov/environment/fspubs/00232839/* and at: *http://www.fs.fed.us/eng/pubs/htmlpubs/htm04232825/*.

Although this publication doesn't address accessibility, it is an important tool used during trail construction and planning. It can be used in conjunction with the FSTAG.

A new version of the *Trail Construction and Maintenance Notebook* will be printed during 2006.

Sidewalks and Trails

The Federal Highway Administration has published *Designing Sidewalks and Trails for Access*, a two-part report on pedestrian accessibility:

Part 1: *Review of Existing Guidelines and Practices* is available in both HTML and PDF formats at: *http://www.fhwa.dot.gov/environment/sidewalks/index.htm*. Part 1 lays out the history and practices of applying accessibility concepts to sidewalks and pedestrian trails.

Part 2: *Best Practices Design Guide* is available in both HTML and PDF formats at: *http://www.fhwa.dot.gov/environment/sidewalk2/index.htm*. Part 2 provides recommendations on how to design sidewalks, street crossings, intersections, shared-use paths, and recreational pedestrian trails.

Equestrian Design Guidelines for Trails, Trailheads, and Campgrounds

A new guidebook for equestrian facility design is scheduled for completion in 2006. This comprehensive technical resource guide will detail those elements of planning, design, and construction that are specific to equestrian trails, trailheads, and campgrounds.

The *Facilities Toolbox*

The *Facilities Toolbox* is an interactive, internal Forest Service facility management Web site designed to help line officers and their staffs manage facilities effectively. The toolbox focuses on issues at administrative sites, but also contains topics such as *Accessibility, Partnerships, Recreation Fee Program, Historic Facilities, and Water and Wastewater*. Forest Service and Bureau of Land Management employees can access this Web site on their internal computer networks at:*http://fsweb.mtdc.wo.fs.fed.us/toolbox/*.

Infra

Infra (*http://infra.wo.fs.fed.us/infra/*) is the Forest Service corporate integrated data management tool developed for the purposes of inventory, asset management, and upward reporting of information concerning constructed features, including their associated financial data. Infra contains data on the accessibility status of constructed features and data on annual and deferred maintenance costs associated with accessibility requirements. The recreation site data entry forms have fields to enter information concerning the status of accessibility under the *site costs* tab and also under the *features* tab. These data must be updated annually.

Recreation & Heritage Resources Integrated Business Systems

The *Meaningful Measures* recreation resources management system has recently become the *Recreation & Heritage Resources Integrated Business Systems* (*http://www.fs.fed.us/r3/measures/*). This recreation resources management system identifies customer standards the Forest Service expects to provide across all recreation and heritage resources program areas. Standards form the baseline for estimating the total cost for quality visitor opportunities and services. Compliance with the accessibility guidelines (figure 20) is an important quality measure within the national standards for recreation sites under the responsiveness key measure. The Infra database houses recreation information including inventory, operation and maintenance costs, recreation-use data, and information on accessibility. The database is used to implement the Recreation & Heritage Resources Integrated Business Systems.

Figure 20—The perfect photo spot—a spectacular view and the right mix of resource protection, site development, and accessibility.

Deferred Maintenance

Accessibility requirements must be met just as other building codes must be met. The costs for any needed accessibility improvements should be included in the Infra deferred maintenance figure. These costs are categorized as deferred maintenance because the work already should have been completed to comply with the ABA.

How and when the costs are included in the deferred maintenance figure depends on the transition plan for that facility. If transition plans have not been completed, the cost to complete them is included in the deferred maintenance figure because they were due for completion before the current fiscal year. The transition plan process (per 7 CFR 15e, section 150) is as follows:

- Evaluate the facility.
- Record improvements needed to meet accessibility standards.
- Develop the transition plan, including:
  —Items to be improved
  —When the improvements are scheduled if the improvements will take more than 1 year to complete

When the transition plan is completed and approved, the costs to implement accessibility code improvements are included in the deferred maintenance figure. If the transition plan will take more than 1 year to complete, costs for actions scheduled for the current year are included in the deferred maintenance figure. Costs for actions that are past due also are included in the deferred maintenance figure. Costs for actions scheduled for future years aren't added to the current year's deferred maintenance figure. They are added to the deferred maintenance figure in the year they are scheduled for completion. As work is completed, it should be shown as an accomplishment in Infra for that fiscal year.

Construction and Maintenance Practices

Even the best universal design can be ruined, often unintentionally, by construction or maintenance practices that change accessible design features into barriers. Construction engineering and inspection personnel must have a thorough understanding of the design intent and of accessibility issues or they must check with the designer before allowing any deviations from the design. For example, field changes such as increasing the slope on a walkway to reduce the cost of asphalt paving or increasing the drop at an exterior door threshold to reduce issues with driving rain can make the entire project inaccessible.

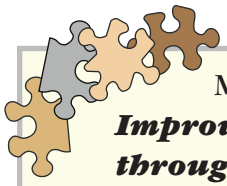
CONSTRUCTION TIP—

Avoiding unintended consequences

Consider accessibility when construction is in progress. Any change order intended to solve one problem could create another. For example, standard speed humps can slow speeding traffic in a campground, but they can also become barriers if the main pedestrian access route through the campground is the roadway. Speed humps can be staggered to block only one lane at a time or limited to the center of the road, leaving 32 inches (815 millimeters) of clear passage at each side. Both of these approaches will slow traffic without blocking access.

Maintenance and operations activities can help or hinder accessibility. When maintenance personnel are being trained, include information on accessibility. When employees understand how their work can affect accessibility, they can look for ways to improve accessibility. For example, a chair or garbage receptacle beside the door of an accessible restroom stall will render the stall inaccessible if it prevents the door from opening fully. Picnic tables that are fastened to the floor of a picnic shelter to prevent theft but that aren't spaced far enough apart will be impossible for some people to use. When gravel walkway material is allowed to erode away from the entrance of a campground restroom, the restroom soon will become inaccessible.

Maintenance also can be an opportunity to improve accessibility. Over time, a series of small changes can make a big difference.



MAINTENANCE TIP—

Improving accessibility through maintenance

Improved accessibility doesn't always mean new construction or major renovation. Maintenance and routine service present many opportunities to improve accessibility.

An **accessible surface** is firm and stable. Use caution with the size and depth of gravel when maintaining unpaved surfaces. Generally, smaller gravel with some fine material can be compacted to a firmer surface than larger gravel or gravel that is all the same size. Depending on the surfacing material, mixing in some soil stabilizer might provide an accessible, natural-appearing surface.

Practical Approach—The surface is probably firm and stable if ruts are not left by:

- Someone riding a bicycle with narrow tires
- Someone pushing a 3-year-old in a folding stroller with small plastic wheels

On paved **parking lots**, designating the required accessible spaces is relatively easy when repainting the parking lot stripes, especially right after the lot

Continued

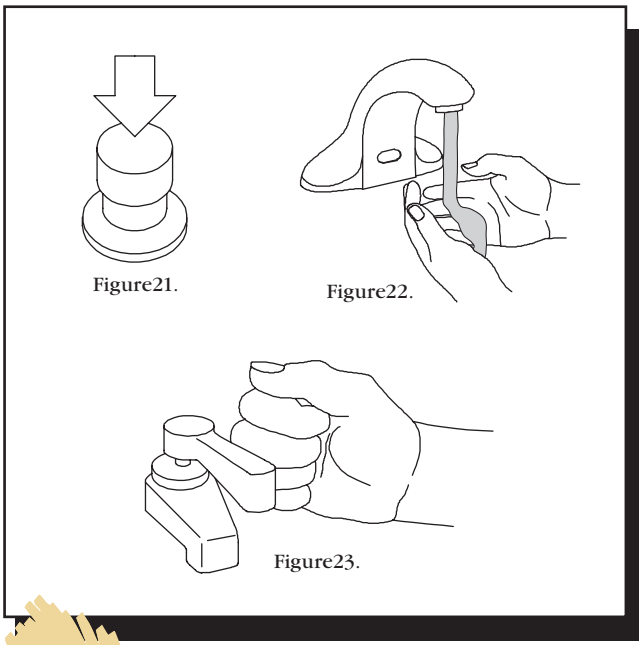
has been seal-coated. Designating accessible parking spaces on gravel lots is even easier. All you need is a sign and probably some parking bumpers to generally define the width of an accessible parking space without obstructing the access aisle. Ensure that signs and curb cuts for ramps are located appropriately—next to, not in the parking space or access aisle.

Building entries must be within ¼ inch (6.4 millimeters) of being flush with the grade of the outside access route and have a beveled doorsill that isn't more than ½ inch (13 millimeters) high. Sometimes it's fairly easy to add surfacing material, shim up the deck or porch boards, or use asphalt or concrete to bring the access route up to the building floor.

The surface at the base of **water hydrants** at recreation areas must be firm and stable with a 60-inch (1,525-millimeter) turning radius. Consider building a wood or concrete surface around hydrants if a soil or gravel surface can't be made firm and stable. If you don't have funding for a major site renovation, you can repair the area around a few hydrants at a time.

When **operating controls** need replacing, think about accessibility. To comply with accessibility guidelines, all controls must be operable without pinching, grasping, or twisting the wrist and with no more than 5 pounds (2.2 newtons) of pressure. When accessible parts are ordered, consider ordering extra parts to keep on hand for future replacements.

Practical Approach—If you can operate the control with a closed fist and with less than 5 pounds (2.2 newtons) of pressure, the control is accessible. Three ways to provide accessible controls are shown in figures 21, 22, and 23.



Figures 21, 22, and 23—Examples of accessible operating controls.

Designing Access Into the Outdoor Environment

This chapter explains how to incorporate the Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG) and Forest Service Trail Accessibility Guidelines (FSTAG) into the outdoor recreation environment.

Suppose you are assigned a project to reconstruct a picnic area or campground, or to design a trail. Based on information from the previous chapters, you know that you'll be using FSORAG and FSTAG rather than *Architectural Barriers Act Accessibility Standards* (ABAAS). As you read through the FSORAG and FSTAG, however, you may have questions about how to apply all the conditions for departure, provisions, and exceptions to the provisions of the guidelines. The purpose of this chapter is to explain how designers should apply the guidelines and to help them understand the rationale behind each of the provisions.

Terminology

Some terms used in the FSTAG and FSORAG may not be familiar. The terms include:

Conditions for departure from the guidelines are circumstances found in natural environments that may make compliance with the provisions difficult.

Exceptions to the provisions are allowed under certain circumstances and are identified in paragraphs labeled "Exception" in the FSTAG and FSORAG.

Scoping means figuring out when, how much, and where the guidelines apply.

Technical provisions state what is required to be done.

The following terms describe construction and maintenance work:

Construction is building a new trail, recreation site, or facility where there was none before.

An **alteration of a trail** is a change in the original purpose, intent, or function for which the trail was designed.

An **alteration of a recreation site, building, or facility** is a change to a portion of a recreation site, building, or facility that is addressed by the accessibility guidelines and that affects the usability of the site, building, or facility.

Maintenance is routine or periodic repair of existing trails, recreation sites, or facilities. Maintenance doesn't change the original purpose, intent, or function of a facility. Maintenance work isn't covered by the FSORAG or FSTAG. Maintenance includes but isn't limited to:

- Repairing or replacing deteriorated, damaged, or vandalized trails, facilities, or components. Examples include repainting, removing graffiti, and repairing or replacing components of facilities with new components similar to the original ones. Components include sections of bridges or boardwalks, signs, fencing and railings, siding, windows, and roofing.
- Removing debris and vegetation, such as fallen trees or broken branches; clearing encroaching vegetation from trails, pathways, lawns, or landscaped areas; and removing rock slides.
- Maintaining trail tread and access routes, including filling ruts, reshaping a trail bed, replacing or reshaping surfacing material, repairing washouts, installing riprap to retain cut and fill slopes, constructing retaining walls or cribbing to support trail tread, and repairing concrete or asphalt paving.
- Performing erosion control and drainage work, such as replacing or installing drainage dips or culverts and realigning sections of trail to reduce erosion or avoid boggy areas.

While the FSORAG and FSTAG don't apply to maintenance, Forest Service policy is to improve accessibility wherever the opportunity arises. Where practicable and feasible, resource managers are encouraged to improve accessibility through maintenance and repair activities as explained in maintenance tip *Improving accessibility through maintenance*.

The term *reconstruction* isn't used in Federal accessibility guidelines or the FSORAG and FSTAG, even though it is frequently used in the recreation and trails communities. For the purposes of the FSORAG and FSTAG, actions are categorized as construction, alteration, or maintenance.

The Purpose of the FSORAG and FSTAG

The FSORAG and FSTAG provide guidance for maximizing accessibility while recognizing and protecting natural settings—sometimes this is a real balancing act! Some basic assumptions:

- The FSORAG and FSTAG closely follow the draft document on outdoor recreation developed by a regulatory negotiations committee of the Architectural and Transportation Barriers Compliance Board (Access Board) and will be modified if necessary to conform to the final document, when it is complete.

- The FSORAG and FSTAG integrate the Forest Service policy of universal design.

- Accessibility is to be considered up front, not as an afterthought.

- All new construction and alterations will be as accessible as possible.

- Compliance with the FSORAG and FSTAG does not mean that all recreation areas and trails will be accessible to all persons with disabilities; in some locations, the natural environment will prevent full compliance with some of the technical provisions.

The FSORAG and FSTAG each include sections explaining when, where, and how much of the recreation area or trail is included (scoping), what has to comply with the guidelines, definitions of terms, and technical provisions defining the physical characteristics of accessible features such as width, height, slope, length, surface conditions, and so forth. The building blocks for accessible design are based mostly on wheelchair dimensions, clear space, maneuvering room, and reach ranges found in the ABAAS because the dimensions, multiple moving surface contact points, and wheels of a wheelchair are the most difficult to accommodate. If someone in a wheelchair can use an area, most other people can too.

Each section of the FSORAG is explained below in practical terms, followed by a similar explanation of the FSTAG.

Applying the Forest Service Outdoor Recreation Accessibility Guidelines

The first step in applying the FSORAG is to know when and where compliance is required. Sections *1.0 General* and *1.1 Extent of Application* state that newly constructed and altered camping facilities, picnic areas, constructed features, beach access routes, and outdoor recreation access routes (ORARs) under Forest Service jurisdiction must comply with sections 1 through 6 of the FSORAG. Every bit of public land does not need to be developed, but if we build something, we need to build it for everybody (figure 24).

Figure 24—Universal design makes sense.

The FSORAG is based on the realities of the outdoor environment. It recognizes that accessibility isn't feasible everywhere because of the limitations imposed by natural terrain, existing vegetation, or other constraints. To ensure that the unique characteristics of the outdoor environment and recreation opportunity at a site aren't compromised or fundamentally altered, exceptions and deviations from some technical provisions are permitted where certain circumstances, called conditions for departure from the guidelines, apply. Conditions for departure apply only where there is an exception detailed in the technical provision sections for a particular recreation feature.

BUDGET TIP—

Is cost an excuse?

If making a new or renovated recreation area accessible adds to the cost, can we claim that it would be an "undue financial burden" and continue without making the area accessible?

No we can't. When a Federal agency, such as the Forest Service, is funding a project, cost cannot be used as the reason for failing to make the project accessible, unless the cost of making the project accessible would have a significant adverse impact on the agency's entire budget. Situations where this would apply are quite rare.

Using the Conditions for Departure in the FSORAG

Although conditions for departure allow for exceptions and deviations due to limitations imposed by the environment, they are not a blanket exemption from the technical provisions. The deviations permitted by conditions for departure should only be used after all other design options to provide accessibility have been thoroughly explored. Deviations are permitted only where an exception is allowed for that particular feature and is needed in the specific area being designed. If a condition for departure exists only on part of the feature, the technical provision applies to the rest of the feature and all the technical provisions that are not affected by the condition for departure apply as well.

DESIGN TIP—

Where do conditions for departure apply?

A good way to get a handle on where a condition for departure applies and where it might not is to consider an example. A renovation project at San Antonio Campground in the Santa Fe National Forest in the Southwestern Region includes a walk-in camping unit where a portion of the outdoor recreation access route (ORAR) is located on extremely steep ground, and there's no way to relocate the ORAR to flatter land. The terrain makes it impossible to meet the technical provision for running slope without severe cuts or fills.

Using the definitions in the FSORAG, the project is an alteration. *Section 2.2 Slopes* of the FSORAG allows an exception from the slope requirement at existing recreation sites that are being altered, where a condition for departure exists. A review of *Section 1.1 Conditions for Departure* indicates that the condition for departure 2 applies to the section of the ORAR that is on steep ground because the cuts and fills necessary to meet the slope provision would substantially change the nature of the setting.

A deviation from the slope provision is permitted for the steep section of the ORAR. However, all other technical provisions for an ORAR such as width, surfacing, and cross slope, must be met. Where the terrain is flatter and the cuts and fills aren't an issue, the technical provision for slope must be met. The exception to the slope provision for the ORAR to this particular walk-in campsite doesn't apply to other campsites at this campground. The ORAR to each campsite must be examined individually to determine if a condition for departure exists that would permit an exception to any provision.

Four conditions for departure permit deviations from specific technical provisions where they are allowed by an exception. Examples are provided to explain the intent of the conditions for departure.

1—Where compliance would cause substantial harm to cultural, historic, religious, or significant natural features or characteristics.

Cultural features include areas such as archeological sites, burial grounds and cemeteries, traditional cultural properties, and tribal protected sites. Historical features are properties listed or eligible for listing on the National Register of Historic Places or other places of recognized historic value. Religious features are tribal sacred sites and other properties considered sacred by an organized religion. Significant natural features are objects such as a large boulder or rocky outcrop, body of water, or unique vegetation that are regarded as distinctive or important locally, regionally, or nationally (figure 25). Areas protected under Federal or State laws, such as habitat for threatened or endangered species or designated wetlands, also could be considered significant natural features.

Figure 25—Properly developed recreation features don't harm significant natural vegetation.

If the significant feature would be directly or indirectly harmed in the process of providing accessibility, this condition for departure would apply. Consider only the additional impact of change necessary to provide accessibility. This condition for departure doesn't apply where substantial impact will result from construction of features that are not accessible and construction directly related to accessibility adds just a little more impact.

DESIGN TIP—
How much is too much?

The harm that is to be considered by this condition for departure is only the additional impact of increasing the size, relocating the recreation feature, or other change necessary to provide accessibility. For instance, there may be concern about the number of trees of an uncommon species being removed to make way for an accessible campsite because removal will cause substantial harm to a significant tree grove. This condition for departure wouldn't apply if 15 trees must be removed to make way for a campsite that is not accessible and only three more trees must be removed to provide for one that is. The majority of the proposed damage to the grove is due to construction of the campsite, not due to compliance with accessibility requirements. In this case, an alternate location should be selected for the campsite.

2—Where compliance would substantially change the nature of the setting or the purpose of the facility or a portion of the facility, or would not be consistent with the applicable forest land and resource management plan for the area.

Public lands provide a wide variety of recreational settings, from highly developed campgrounds with plenty of opportunities to relax with family and friends, to wilderness areas that appear unchanged from primeval times with opportunities to experience primitive and challenging conditions (figure 26). The FSORAG recognizes the value of a wide array of recreational opportunities by allowing exceptions where compliance with technical provisions would unacceptably change the nature of recreation opportunities or conflict with the land and resource management plan for the area.

Figure 26—People who recreate in primitive areas may be looking for risk and challenge.

Campers in a primitive setting experience the outdoor environment in a nearly natural state, with limited or no development. These campers generally desire challenge and risk so they can use their outdoor survival skills. Use of manufactured building materials or engineered construction techniques to comply with accessibility requirements could destroy the natural or undeveloped nature of the setting. There is no requirement to use drastic measures to provide accessibility if doing so would unacceptably change the character of the setting and the recreation opportunity.

DESIGN TIP—

Looking at the full range of issues

Designers and managers need to examine the larger context and intent of the project to determine whether this condition for departure applies. The full range of management and design issues must be considered. Consideration of impacts should begin during planning and continue throughout all stages of design development.

Consider existing and desired levels of development and site modification as identified in ROS classifications, visitor expectations, customer service, and so forth. Take into account how the site will be used. Will it be a jumping-off point to a wilderness where campers bring lightweight, compact equipment, or will it be a social gathering place where visitors bring a good portion of their worldly possessions and expect to have a place to set them up?

This condition for departure would apply differently to a setting that has little or no human-influenced modifications than it would to a setting that has already been moderately or heavily modified, such as a recreation site.

3—Where compliance would require construction methods or materials that are prohibited by Federal, State, or local law, other than State or local law whose sole purpose is to prohibit use by persons with disabilities.

This condition for departure can be illustrated by example. For instance, use of mechanized equipment is prohibited in congressionally designated wilderness areas. If work necessary to comply with a technical provision can't be accomplished using handtools, this condition for departure will apply in wilderness areas.

This condition for departure may also apply in:

- Areas where imported materials, such as soil stabilizers, are prohibited to maintain the integrity of the natural ecosystem or historic resources.
- Designated wetlands or coastal areas where construction methods and materials are strictly limited.
- Areas where Federal statues such as the Wilderness Act, the Endangered Species Act, or State and local laws impose restrictions to address environmental concerns.
- Areas where water crossings are restricted to safeguard aquatic features protected under Federal or State laws.

Local law has been included in this condition for departure to address situations where conservation or scenic easements or development programs have prohibited or restricted construction methods and practices. For example, where land is purchased from farms, certain use restrictions may prohibit importing surfacing materials.

On the other hand, under the Americans with Disabilities Act, State and local governments may not establish laws whose sole purpose is to prohibit use by people with disabilities. Therefore, such laws may not serve as a basis for deviation from the technical provisions in the FSORAG.

4—Where compliance would be impractical due to terrain or prevailing construction practices.

The phrase *would be impractical* in this condition for departure refers to something that isn't reasonable, rather than to something that is technically impractical. The intent of this condition for departure is that the effort and resources required to comply shouldn't be disproportionately high relative to the level of access established.

For example, when renovating an ORAR, compliance with the technical provisions, particularly those pertaining to running slope in areas of steep terrain, may require extensive cuts or fills that would be difficult to construct and maintain and that would cause drainage and erosion problems in highly susceptible soils. If compliance with the FSORAG requires techniques that clash with the natural drainage or existing soil, then the ORAR will be difficult—if not impossible—to maintain.

This condition also may apply where construction methods for particularly difficult terrain or an obstacle would require the use of equipment or methods other than that typically used in that setting. In an area where small equipment is normally used to minimize impact on a sensitive adjacent stream, blasting might be necessary to remove a rock outcrop. Because blasting typically would not be used in this situation, this condition for departure would apply. If the work could be done using small equipment, the condition for departure wouldn't apply.

This condition for departure isn't intended to exempt an area from the technical provisions simply because of preferred construction practice. A contractor may prefer to use a large mechanical roller for efficiency rather than a smaller vibrating plate or impact-type compactor that might be more appropriate in some settings. A contractor's or designer's preference for the larger equipment isn't a feasibility issue.

Getting From Here to There—Outdoor Recreation Access Routes

Section 2.0 of the FSORAG defines an outdoor recreation access route (ORAR) as a continuous, unobstructed path intended for pedestrian use that connects constructed features within a picnic area, camp living area, trailhead, or other recreation site where modifications are provided for visitor convenience and comfort. Figure 27 shows an ORAR connecting a parking lot and scenic overlook. ORARs must meet the required provisions for accessibility.

Figure 27—There would be no point in providing a viewing area for the gorgeous Mendenhall Glacier in Alaska if people couldn't get there from the parking area. ORARs are all about getting around.

Forest Service recreation sites are described using a six-level development scale ranging from *0—No site Modification to 5—Extensive Site Modification*. Site modifications are provided for visitor convenience and comfort in recreation sites with development levels 3, 4, and 5. Rustic or rudimentary site modifications may be provided for resource protection at level 2 or less. Definitions of each level of the Forest Service's recreation site development scale are available at *http://www.fs.fed.us/r3/measures/ Cost/Infra_Files/APPENDIX%20H_Levels%20of%20Site%20Modification.doc*.

General forest areas (GFAs) are nonwilderness National Forest System lands that are available for recreation use, where structures are built only when they are

required for resource protection. These minimal developments, which may include picnic tables, fire rings, or toilet structures, are level 2 or less on the Forest Service recreation site development scale. ORARs are not required in GFAs.

In recreation sites, ORARs ensure that visitors can move independently from their camping or picnic spot to the other constructed features provided at the site or from the parking area to any constructed features. ORARs must meet requirements for running and cross slopes, resting intervals, surface, clear tread width, passing spaces, tread obstacles, protruding obstacles, openings, edge protection, and stairs.

Slopes and Resting Intervals for ORARs

ORARs are to be designed with a running slope ratio of 1:20 (5 percent) or less (figure 28). Steeper terrain may make this difficult to achieve. Visitors can negotiate steeper slopes for short distances, so running slopes up to 1:12 (8.33 percent) are permitted for up to 50 feet (15 meters), and running slopes of up to 1:10 (10 percent) are permitted for up to 30 feet (9 meters). To ensure that the ORAR isn't designed as a series of steep segments, no more than 15 percent of the total length of the ORAR may exceed a slope of 1:12 (8.33 percent). Running slope is the lengthwise slope of an ORAR, parallel to the direction of travel.

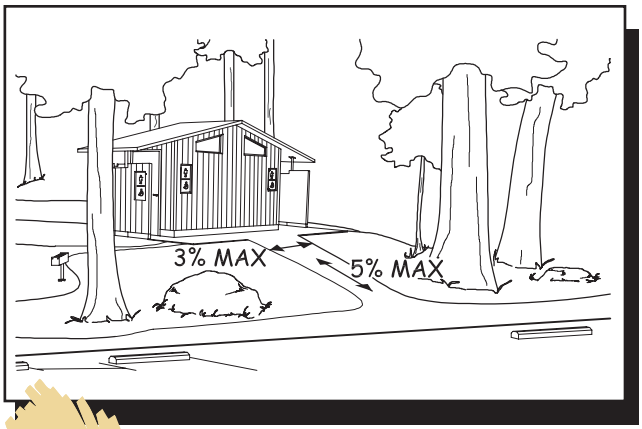


Figure 28—Determining the slope ratio.

Cross slopes—the side-to-side slope of an ORAR—can't exceed 1:33 (3 percent, see figure 28), although an exception permits a cross slope of up to 1:20 (5 percent) if necessary for proper drainage.

CONSTRUCTION TIP—

What is a slope ratio?

Slopes are often described as a ratio of vertical distance to horizontal distance, or rise to run. For instance, a slope of 1:20 means that for every 1 foot of vertical rise, there are 20 feet of horizontal distance, or for every meter of vertical rise, there are 20 meters of horizontal distance (figure 29).

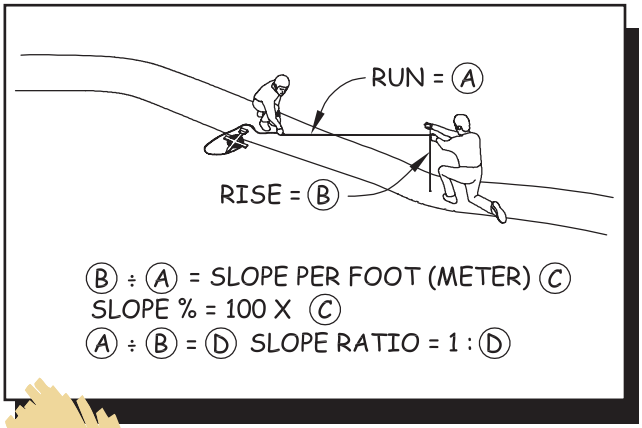


Figure 29—The basic slope requirements for ORARs and beach access routes.

Resting intervals are relatively level areas that provide an opportunity for people to catch their breath before continuing along the ORAR. These intervals are required any time the running slope exceeds 1:20 (5 percent). A resting interval must be at least 60 inches (1,525 millimeters) long and at least as wide as the ORAR leading into it.

The slopes of a resting interval can't exceed 1:33 (3 percent) in any direction (figure 30).

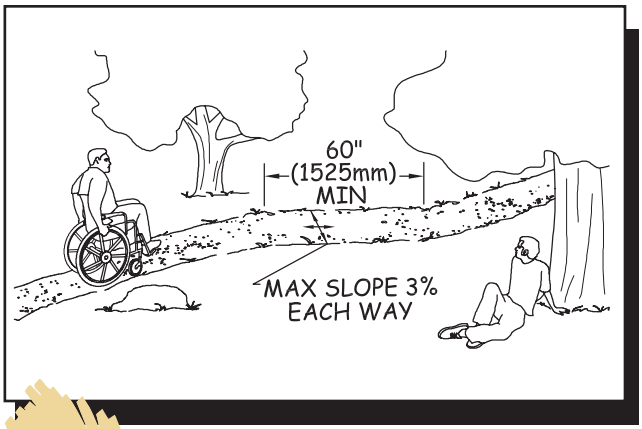


Figure 30—The basic resting interval requirements for ORARs.

Where running slopes are between 1:20 (5 percent) and 1:12 (8.33 percent), resting intervals must be provided at least every 50 feet (15 meters). For slopes from 1:12 (8.33 percent) to 1:10 (10 percent), resting intervals must be provided at least every 30 feet (9 meters). Depending on the design and location, the intersection of two ORARs may act as a resting interval.

Meeting the slope requirements for an ORAR may be more difficult when altering an existing site than it would be in new construction. Accessibility was seldom considered when older recreation sites were designed. Many campgrounds and picnic areas were located in spectacularly scenic settings, but on steep terrain. Complying with the slope provision in these areas may be difficult without a fundamental change to the recreation environment, so exceptions are provided for alteration projects where a condition for departure exists. This is one of only two instances where the FSORAG makes a distinction between new construction and alterations. The second exception is campground alterations, discussed later in this chapter.

In alterations only and where a condition for departure exists, exceptions are provided that permit running slopes up to 1:12 (8.33 percent) for 100 feet (30 meters), and up to 1:10 (10 percent) for 50 feet (15 meters). When these slopes are used, resting intervals are required every 100 feet (30 meters) and 50 feet (15 meters), respectively. Even with those exceptions, it may still not be possible to comply with the slope provision without drastically affecting the site. In these cases, a general exception to the entire slope provision is included if a condition for departure exists.

Where this occurs, the ORAR doesn't have to meet any of the slope requirements. However, designers should attempt to comply with the general slope requirement first, then each exception in order, to assure that the final design meets the highest possible technical provisions.

This exception **does not apply** to new construction. When planning for a new facility, the natural terrain and the general accessibility of the area itself should be part of the site selection criteria because compliance with ORAR provisions is required for new construction.

DESIGN TIP—

When should handrails be used on outdoor stairs?

The use of outdoor stairs should be avoided wherever possible. Sometimes, an alteration project at an existing recreation site includes an area where stairs can't be avoided. The amount of use, safety, and the avoidance of the appearance of over development all are important considerations when deciding whether handrails are necessary and how many should be provided. For example, 5-foot wide stairs at a campsite may have just one handrail in the center to accommodate low-volume, two-way traffic. Treads that are just wide enough for one-way traffic could have one handrail. Two handrails may be needed if stairs are provided in high-traffic areas.

Handrails are not required for stairs in GFAs. Handrails may be provided if they are needed for safety.

Surfaces for ORARs

The surface of an ORAR and the surface surrounding constructed features must be firm and stable. No exceptions are allowed. Slip resistance is not required because leaves and needles, dirt, ice, snow, and other surface debris and weather conditions are components of the natural environment that would be difficult, if not impossible, to avoid.

The FSORAG defines a firm surface as a surface that is not noticeably distorted or compressed by the passage of a device that simulates a person using a wheelchair. A stable surface is defined as a surface that is not permanently affected by normally occurring weather conditions and can sustain wear and tear during normal use between planned maintenance cycles. During the planning process, the compaction qualities of natural soils should be evaluated under weather conditions that occur normally when the surface will be used.

If the natural soils won't provide a firm and stable surface, soil stabilizer or artificial surfacing will be needed. The Forest Service Technology and Development report, *Soil Stabilizers on Universally Accessible Trails*, contains information about the effectiveness of soil stabilizers. It is available at: *http://www.fs.fed.us/eng/pubs/pdf/00*

DESIGN TIP—

Paving the wilderness?

Does a firm and stable surface always mean concrete and asphalt? No! The surface provision states that the type of surface material used should be appropriate to the setting and level of development. Some natural soils can be compacted so they are firm and stable. Other soils can be treated with stabilizers without drastically changing their appearance. Many surfaces that appear natural and that meet the firm and stable requirements also are available on the market. Designers are encouraged to investigate these options and use surfacing materials that are consistent with the site's level of development and that require as little maintenance as possible.

CONSTRUCTION TIP—

Surfacing materials

Generally, the following materials provide firmer surfaces that are more stable:

- Crushed rock (rather than uncrushed gravel)
- Rock with broken faces (rather than rounded rocks)
- A rock mixture containing a full spectrum of sieve sizes (rather than a single size)
- Hard rock (rather than soft rock that breaks down easily)
- Rock that passes through a ½-inch (13-millimeter) screen (rather than larger rocks)
- Rock material that has been compacted into 3- to 4-inch (75- to 100-millimeter) thick layers (rather than thicker layers)
- Material that is moist, but not too wet, before it is compacted (rather than material that is compacted when it is dry)
- Material that is compacted with a vibrating plate compactor, roller, or by hand tamping (rather than material that is laid loose and compacted by use)

231202.pdf and *http://www.fhwa.dot.gov/environment/fspubs/00231202/*.

Firm and stable surfaces prevent assistive devices from sinking into the surface, which would make movement difficult for a person using crutches, a cane, a wheelchair, or other assistive device. In the accessibility guidelines, the standard assistive device is the wheelchair because its dimensions, multiple moving surface contact points, and four wheels often are difficult to accommodate. If a person using a wheelchair can use an area, most other people also can use that area.

DESIGN TIP—

What is firm and stable?

In the late 1990s, the Access Board funded an Accessible Exterior Surfaces research project conducted by Beneficial Designs of Minden, NV. Results of the study are available on the Access Board's Web site at: *http://www.access-board.gov/research/Exterior%20Surfaces/exteriorsarticle.htm*. Figure 31 shows the rotational penetrometer tool that can be used to evaluate surfaces. For further information, consult Beneficial Designs' Web site at: *http://www.beneficialdesigns.com/*. One of the results of the project was development of a scientific method for determining firm and stable exterior surfaces.

What sort of surface is firm and stable? In general, if the answer to both of the following questions is *yes*, the surface is probably firm and stable.

- Could a person ride a narrow-tired bicycle across the surface easily without making ruts? (The bicycle tires are similar to large rear wheels of a wheelchair.)
- Could a folding stroller with small, narrow plastic wheels containing a 3-year-old be pushed easily

Continued

stroller's wheels are similar to the front wheels of a wheelchair.)

While this method for determining firmness and stability isn't scientifically accurate, it has proven to be effective.

Figure 31—Using the rotational penetrometer to determine whether a surface is firm and stable.

Clear Tread Width and Passing Spaces for ORARs

Clear tread width means the width of the traveled surface on the ground and also above the ground between obstacles (figure 32). The minimum clear tread width of an ORAR is 36 inches (915 millimeters), which is wide enough to allow unobstructed passage by a wheelchair. Where a condition for departure exists, such as when an ORAR must be routed between two large boulders that can't be removed, then the clear tread width may be reduced to not less than 32 inches (815 millimeters) for a maximum distance of 24 inches (610 millimeters).

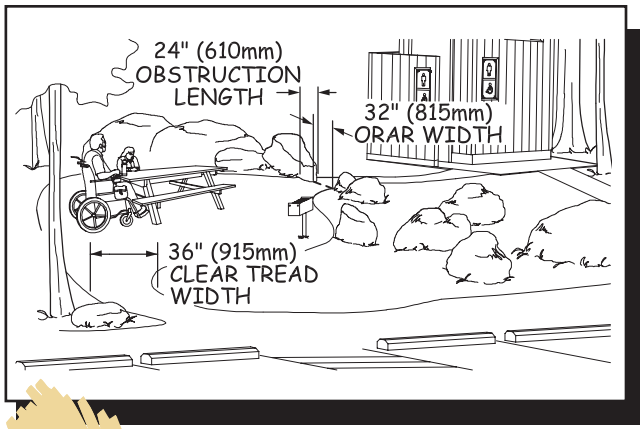


Figure 32—The clear tread width is the width of the unobstructed traveling surface.

DESIGN TIP—

How wide should the access route be?

The 36-inch (915-millimeter) minimum clear tread width is just that—a minimum. To determine how wide the ORARs in a project should be, look at the level of development of the site and how it will be used. In a more highly developed area, a 48- or 60-inch- (1,220- or 1,525-millimeter-) wide ORAR may be appropriate, while a 36-inch- (915-millimeter-) wide tread may be a better fit in a less developed site.

All ORARs in a recreation site don't necessarily have to be the same width. It may make sense to vary the width, depending on the location of the ORAR. For example, a designer may decide to make the main ORAR 60 inches (1,525 millimeters) wide if it connects campsites to important constructed features, such as a rustic outdoor amphitheater, toilet buildings, or water hydrants.

Secondary ORARs, such as a spur from the main ORAR to a quiet, intimate path along a stream, may be only 36 inches (915 millimeters) wide. Consider how many people will likely be using the ORAR at the same time and how they will want to use it—single file or walking and talking side by side—and design accordingly.

Two wheelchairs need 60-inch- (1,525-millimeter-) clear tread width to pass comfortably and safely on an ORAR. However, this width isn't always appropriate or required. Where the clear tread width of an ORAR is less than 60 inches (1,525 millimeters), passing spaces are required at least every 200 feet (60 meters). If this isn't possible because of a condition for departure, an exception is provided that permits passing spaces to be 300 feet (90 meters) apart. Passing spaces must be at least 60 inches (1,525 millimeters) wide (including the ORAR width) by 60 inches (1,525 millimeters) long (figure 33).

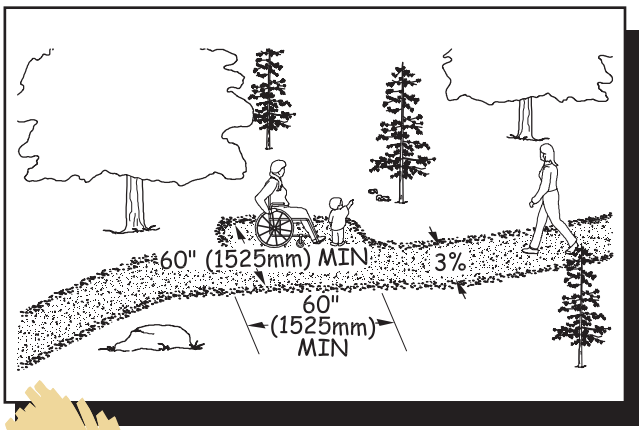


Figure 33—A passing space for an ORAR or a beach access route.

Another option allows a T-intersection of two ORARs or other walking surfaces to be a passing space (figure 34), provided that the arms and stem of the T-shaped space extend at least 48 inches (1,220 millimeters) beyond the intersection. Either configuration would provide enough room for someone to move to the side and let an oncoming person pass along the ORAR. The cross slope of a passing space shouldn't exceed 3 percent.

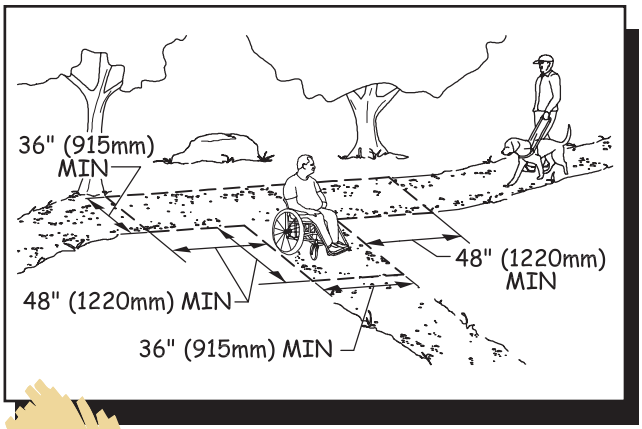


Figure 34—A "T" Intersection for passing on an ORAR or a beach access route.

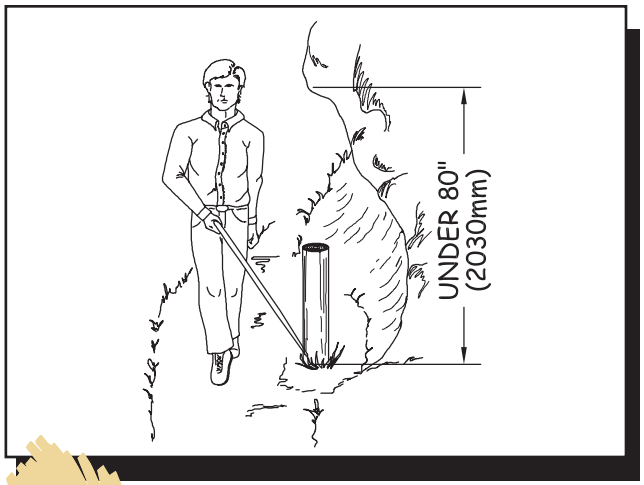


Figure 35—A warning barrier is required wherever vertical clearance is insufficient.

Tread Obstacles on ORARs

A tread obstacle is anything that interrupts the evenness of the tread surface. On ORARs, an obstacle may occur where a tree root or rock protrudes above the surface or where two different surfaces abut, such as when a concrete path joins an asphalt path. If they are pronounced, tread obstacles can pose a serious tripping hazard. Where tread obstacles exist along an ORAR, they can't be more than 1 inch (25 millimeters) high. If compliance with this provision isn't possible because of a condition for departure, an exception permits obstacles up to 2 inches (50 millimeters) high, provided that the obstacle is beveled with a maximum 1:2 slope.

Protruding Objects and ORARs

Protruding objects extend into the clear width area of an ORAR from beside or above the ORAR. Leaning tree trunks, rock ledges, and branches are common protruding objects. The ORAR must provide at least 80 inches (2,030 millimeters) of clear headroom (figure 35), which is the same requirement as ABAAS section 307. Where the vertical clearance of an ORAR is reduced to less than 80 inches (2,030 millimeters) because of a condition for departure, a barrier to warn blind and visually impaired persons must be provided. This exception allows an ORAR to pass under ledges or other naturally constricted areas.

Openings in ORAR Surfaces

Openings are gaps in the surface of an ORAR. Gaps include spaces between the planks on a boardwalk or in a drainage grate. Openings that are big enough for wheels, cane or crutch tips, or shoe heels to drop through are hazards that shouldn't exist in pedestrian routes (figure 36). Openings up to ½ inch (13 millimeters) wide are permitted. Elongated openings must be placed so that the long dimension runs perpendicular

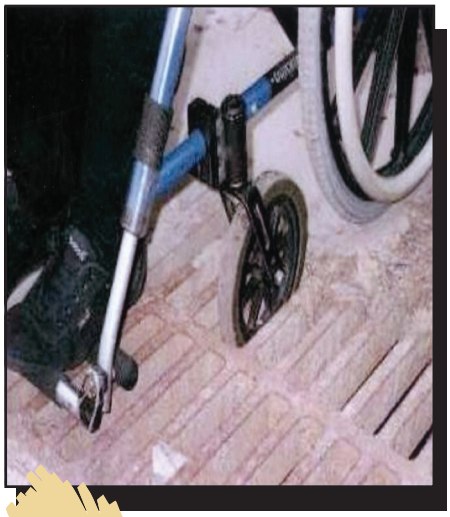


Figure 36—Big openings in ORAR surfaces are a bad idea.

or diagonal to the primary direction of travel (figure 37). Openings narrower than ¼ inch (6.4 millimeters) are allowed parallel to the dominant direction of travel.

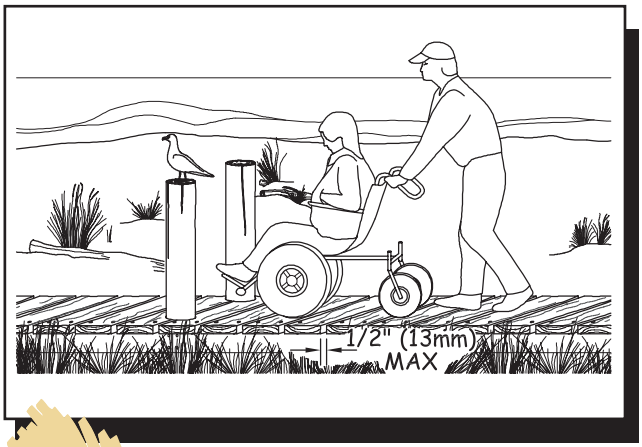


Figure 37—Elongated openings must be perpendicular to the direction of travel.

Edge Protection for ORARs

Edge protection is a raised curb, wall, railing, or other structure that defines the edge of a travel surface and helps keep people and assistive devices from accidentally falling off the edge. Edge protection is not required for accessibility on ORARs. However, where designers and managers have determined that edge protection is required for safety or other reasons, the FSORAG requires curbs to be at least 3 inches (76 millimeters) high (figure 38). This is higher than required by the ABAAS because objects less than 3 inches (75 millimeters) high aren't easy to see or detect outdoors and could become a tripping hazard.

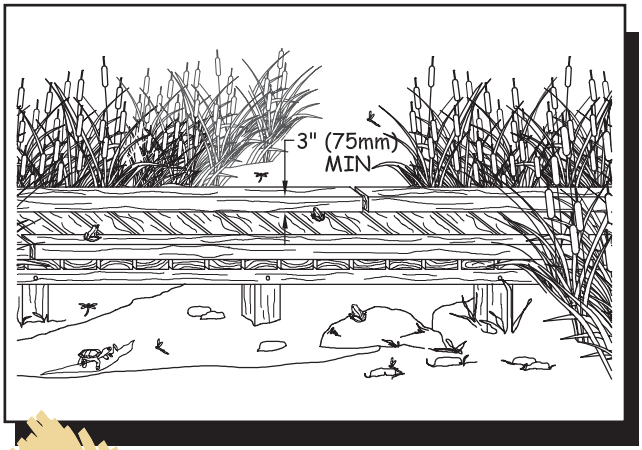


Figure 38—Edge protection is optional on an ORAR, but if present, edge protection must be at least 3 inches high.

Getting to the Water—Beach Access Routes

A beach access route is a continuous unobstructed path intended for pedestrian use that crosses the surface of the beach. Because beach access routes and ORARs perform similar functions, their provisions are closely related. Section 3 of the FSORAG covers beach access routes.

Beaches are grouped into three general types:

- Coastal beaches
- River beaches
- Lake, pond, or reservoir beaches

Beach access routes allow pedestrians to get to the water so they can play, swim, or participate in other shoreline activities. Areas where entry into the water may be possible, but no specific path or route is provided, aren't beach access routes.

A beach access route is a pathway over the surface of the beach itself that leads to the water. The route leading to the edge of the beach surface in a recreation area is an ORAR.

The FSORAG has different requirements for new and existing beaches. A new beach is a site where a beach is created artificially by importing sand or other beach material. At least one beach access route must be provided for each linear half mile (800 meters) of new beach. The beach access route must be permanent and extend to the high tide level for coastal beaches, the mean high water level for river beaches, or the normal recreation

water level for lakes, ponds, and reservoirs (figures 39, 40, and 41).

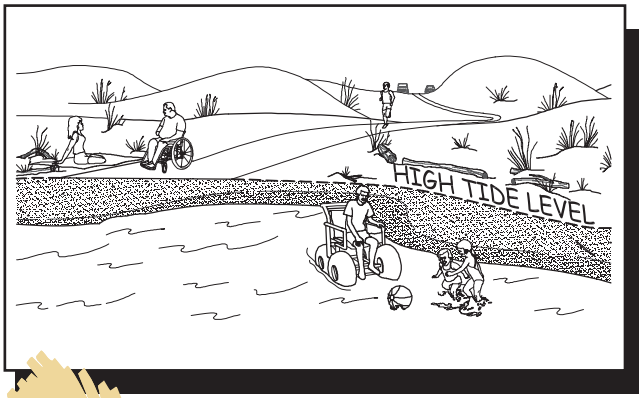


Figure 39—The high tide level on a coastal beach.

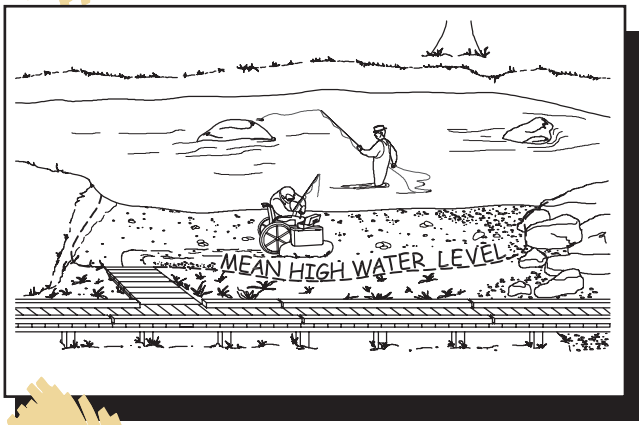


Figure 40—The mean high water level on a river.

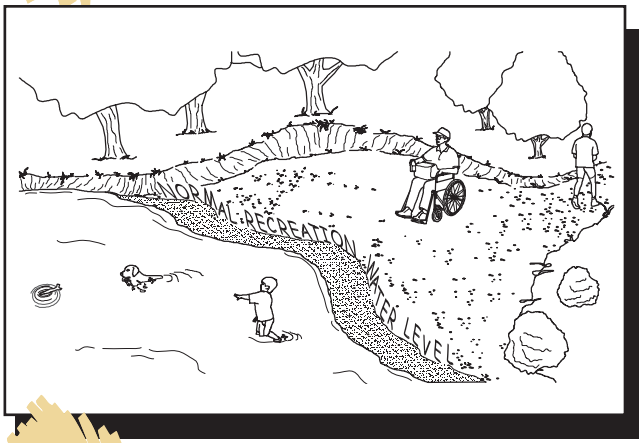


Figure 41—The normal recreation water level on a lake.

DESIGN TIP—

How far down the beach must the access route go?

Beach access to the water will vary considerably depending on geographic locations because the difference between low and high tides varies from place to place. For example, a beach in Alaska may experience tidal differences of up to 30 feet (9 meters); beaches in Florida will have much smaller differences between the tides. The high tide mark is a reasonable location to stop constructed features; they are much more likely to wash out below this point. The mean high water level applies to rivers and the normal recreation water level applies to lakes.

In some locations, it may make sense to continue the beach access route below the mean high water level or normal recreation water level. In locations with significant variations in water level through the recreation season, visitors appreciate extended access routes where they can be constructed (figure 42).

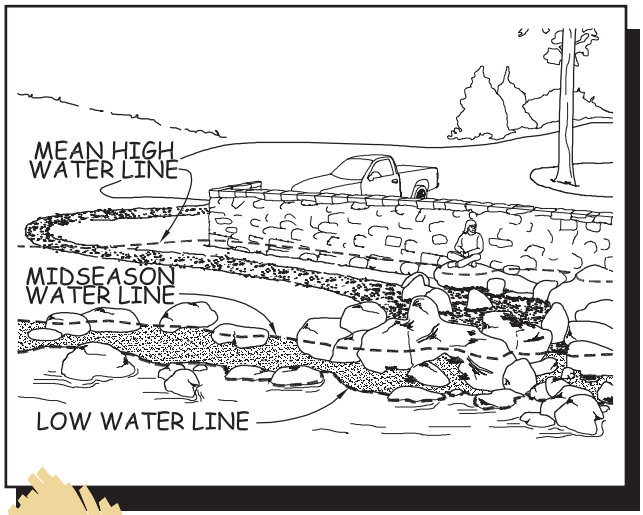


Figure 42—This beach access route is partly inundated every year.

Beach access routes must be provided to existing beaches when a pedestrian route is constructed from a recreation site to or along the edge of an existing beach, or when an existing beach access route is altered. It must extend to the high tide level, mean high water level, or normal recreation water level as described for new beaches, so that visitors can participate in water-related recreation activities (figure 43).

Figure 43—Everybody ought to be able to get to the beach.

Several exceptions are permitted for routes on existing beaches. Designers and managers can chose to use a temporary beach access route on existing beaches for administrative, environmental, or operational reasons. Factors that might influence a decision in favor of a temporary beach access route include the restrictive permits that may be required in coastal and shoreline areas, or excessive wave action that can cause erosion, quickly turning a permanent beach access route into a hazard. Vehicular access or access provided by an assistive device isn't an acceptable temporary beach access route.

Routes created solely for shoreline maintenance don't have to meet beach access route requirements; neither do undeveloped public easements, nor access trails when another beach access route meets the requirements and accesses the same beach within ½ mile (800 meters).

Beach access route requirements are not triggered when an existing beach is being replenished with new material to restore eroded areas, so long as no other improvements are made. Beach access routes are not required when the pedestrian route, boardwalk, or pathway along the edge of an existing beach is elevated 18 inches (455 millimeters) or higher above the beach surface.

Slopes and Resting Intervals for Beach Access Routes

Running slopes—the slope parallel to the direction of travel—on a beach access route may be up to 1:20 (5 percent) for any distance, up to 1:12 (8.33 percent) for 50 feet (15 meters), and up to 1:10 (10 percent) for 30 feet (9 meters). To ensure that the beach access route is not designed as a series of steep segments, no more than 15 percent of the total length may exceed a slope of 1:12 (8.33 percent). As with ORARs, **for alteration projects only**, the requirement for running slope doesn't have to be met if there is a condition for departure. Cross slopes—the side-to-side slope—may not exceed 1:33 (3 percent). The basic slope requirements are the same as for ORARs (see figure 29).

Resting intervals identical to those required for an ORAR are required whenever the running slope of a beach access route exceeds 1:20 (5 percent). See *ORAR Slopes and Resting Intervals* for resting area requirements.

Maneuvering Space for Beach Access Routes

Space must be provided at the high tide level, mean high water level, normal recreation water level, or at the end of a beach access route so someone using an assistive device can move around safely. This maneuvering space is different from a passing area, because maneuvering space

can't overlap the beach access route. Other requirements, such as running slope and cross slope, are the same as described for an ORAR passing space.

Surface and Clear Tread Width on Beach Access Routes

A beach access route must have a firm and stable surface and have 36-inch (915-millimeter) minimum clear tread width. If a condition for departure exists, such as when a beach access route passes between a large boulder and a stream, the clear tread width may be reduced to not less than 32 inches (815 millimeters) for no longer than 24 inches (610 millimeters).

Passing Spaces on Beach Access Routes

Where the clear tread width of a beach access route is less than 60 inches (1,525 millimeters), passing spaces are required at least every 200 feet (60 meters). No exception is permitted. Passing spaces are at least 60 inches (1,525 millimeters) wide by 60 inches (1,525 millimeters) long (see figure 33). Another option allows a T-intersection of two beach access routes or other walking surfaces to be a passing space, provided that the arms and stem of the T-shaped space extend at least 48 inches (1,220 millimeters) beyond the intersection (see figure 34). Either configuration would provide enough room for someone to move to the side and let an oncoming person pass. The cross slope of a passing space shouldn't exceed 3 percent.

Changes in Level on Beach Access Routes

Obstacles along a beach access route must not be more than 1 inch (25 millimeters) high. There is no exception.

Protruding Objects on Beach Access Routes

Protruding objects are things such as leaning trees, rock ledges, and driftwood that extend into the clear width of a beach access route. At least 80 inches (2,030 millimeters) of clear headroom must be provided on beach access routes, the same requirement as ABAAS section 307. Where the vertical clearance of a beach access route is less than 80 inches (2,030 millimeters) because of a condition for departure, a barrier must be provided to warn people who are blind or visually impaired (see figure 35).

Openings in Beach Access Routes

Openings are gaps in the surface of a beach access route. Gaps include spaces between the planks on a boardwalk and drainage holes in temporary or permanent surfaces. Openings that are big enough for wheels, cane or crutch tips, or shoe heels to drop through or get stuck in are hazards that shouldn't exist in pedestrian routes. Openings up to ½ inch (13 millimeters) wide are permitted. Elongated openings must be placed so that the long dimension runs perpendicular or diagonal to the primary direction of travel (see figure 37). An exception allows openings that are less than 1/4 inch (6.4 millimeters) wide to be placed parallel to the dominant direction of travel.

Edge Protection for Beach Access Routes

Edge protection is required along beach access routes where the dropoff from the route to the beach is 6 inches (150 millimeters) or higher. Edge protection may be a curb, wall, railing, or other projecting surface that defines the edge of a pedestrian route and helps to keep people from falling off. Edge protection must be at least 2 inches (50 millimeters) high (figure 44). If the dropoff from the route to the beach is more than 1 inch (25 millimeters) but less than 6 inches (150 millimeters), edge protection isn't required, but the vertical edge of the dropoff must be beveled with a slope of 1:2.

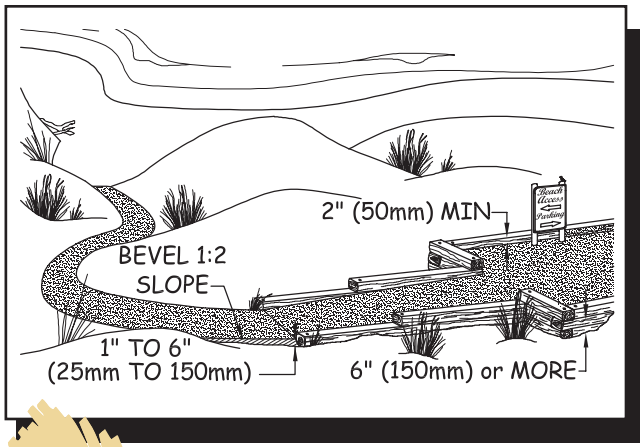


Figure 44—The requirements for edge protection on a beach access route.

42 Providing Creature Comforts and Conveniences—Constructed Features

Constructed features are the site furnishings and other elements provided in picnic areas, campgrounds, and other recreation sites. The constructed features addressed in sections 4, 5, and 6 of the FSORAG include **picnic tables, cooking surfaces, camping units, parking spurs, tent pads and platforms, fire rings, wood stoves, fireplaces, utilities, utility sinks, benches, trash containers,** and **recycling containers**. Also included are **viewing areas, telescopes, periscopes, storage facilities for assistive devices, pit toilets, warming huts, outdoor rinsing showers,** and **signs**.

The Forest Service policy of universal design directs the agency to construct, purchase, and install only elements and constructed features that are accessible. For example, even if steep terrain or other conditions in an alteration project at a recreation site preclude complying with the slope provisions for the ORAR to a picnic table or camping unit, all the components and furnishings still must comply with the relevant sections of the FSORAG. Individuals can select the location where they want to picnic or camp without being limited by the location of accessible features of the picnic or camping unit. This requirement includes all picnic tables, pedestal grills, and other features in a picnic area or campground if they are purchased or constructed by or on behalf of the Forest Service. The few exceptions to this general rule are explained below.

CONSTRUCTION TIP—
Is it really accessible?

Manufacturers don't necessarily understand accessibility requirements. Some manufacturers advertise their products as "accessible" or "ADA compliant," even though they aren't. The only way to make sure that a product such as a picnic table or fire ring is truly accessible is to compare the dimensions of the product to the ABAAS or FSORAG requirements. Ask the manufacturer for the shop drawings or for the location of a retailer or campground near you where you can examine the product.

The FSORAG doesn't require that any particular constructed feature be provided in a picnic area or campground. If there were no plans to provide outdoor rinsing showers, utility sinks, or utility hookups at a campground, the FSORAG wouldn't require them to be installed. However, if a feature is provided, the FSORAG requirements must be met. The same principle applies in general forest areas (GFAs). The FSORAG doesn't require constructed features and site furnishings to be provided in GFAs, but if they are provided, they must meet the requirements of the FSORAG.

Constructed features are addressed in three sections in the FSORAG: picnic areas, campgrounds, and other. The divisions aren't absolute, as some features addressed in one section may also be found in another. For example, picnic tables are addressed under *Constructed Features*

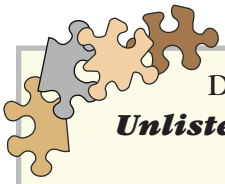
for Picnic Areas, but the same technical provisions apply to tables provided in campgrounds. Trash receptacles are covered under *Other Constructed Features*, even though trash receptacles are commonly found in picnic areas and campgrounds.

Clear floor or ground space is required at each constructed feature, but the size of the clear area varies with the feature. The differences are based on how each feature is used and whether users need to approach just one side of the feature or all sides of it. For instance, users may only need to get to the front of a water hydrant, but they need to get to all sides of a picnic table or fire ring. When several constructed features are grouped together, their clear spaces may overlap. For example, the 48-inch (1,220-millimeter) clear space around a picnic table may overlap the 48-inch (1,220-millimeter) clear space around a pedestal grill provided in a picnic unit. The clear space of a constructed feature is **not** allowed to overlap the ORAR connecting the feature to the rest of the site.

Reach Ranges and Operability Requirements

In this guide, you will see the requirement "Controls and operating mechanisms must comply with the provisions for reach ranges and operability specified in ABAAS sections 308 and 309" whenever a constructed feature has buttons, knobs, handles, or other controls or operating devices. One of the basic principles of universal design and accessibility is to provide controls that almost everyone can reach and use.

The ABAAS section 309 requires that controls and operating mechanisms have to be operable with one hand without tight grasping, pinching, or wrist twisting, using a force no greater than 5 pounds (2.2 newtons).



DESIGN TIP—

Unlisted features

What if a designer wants to provide a constructed feature that isn't addressed in the FSORAG? Lantern hooks often are provided in campgrounds, but the FSORAG does not address lantern hooks. In this case, designers would need to go back to the basic building blocks of accessible design—wheelchair dimensions, clear space, and reach ranges found in the ABAAS.

Using that information and the principles of universal design, designers would know that if the hooks were to be usable to the greatest number of campers of all ages, with and without disabilities, the hooks would need to be placed within the reach range of someone in a seated, as well as a standing, position.

This could be accomplished by a mechanical device to raise the hook or by installing two hooks at the proper levels. The lantern hook also would need to have the appropriate clear space around it to allow someone in a wheelchair to approach it from the front or the side. The clear space for the lantern hook shouldn't overlap the ORAR.

DESIGN TIP—

Forward reach and side reach

When the terms forward reach and side reach are used in the context of accessibility, they don't refer to the object a person is trying to reach. They refer to the position of the person doing the reaching. A forward reach means that the person is facing the object and reaching forward toward it (figure 45). A side reach means that the person's side is closest to the object, and the person is reaching either to their right or left towards the object (figure 46). People using wheelchairs can't reach as far forward over their laps as they can reach to the side. They also need different sized spaces to position their wheelchairs to be able to reach objects from the front and from the side. This is why there are different height and clear floor space requirements for forward and side reaches.

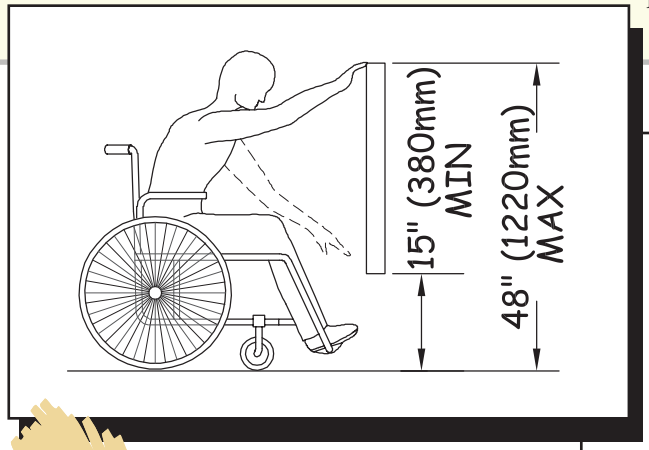


Figure 45—The requirements for unobstructed forward reach.

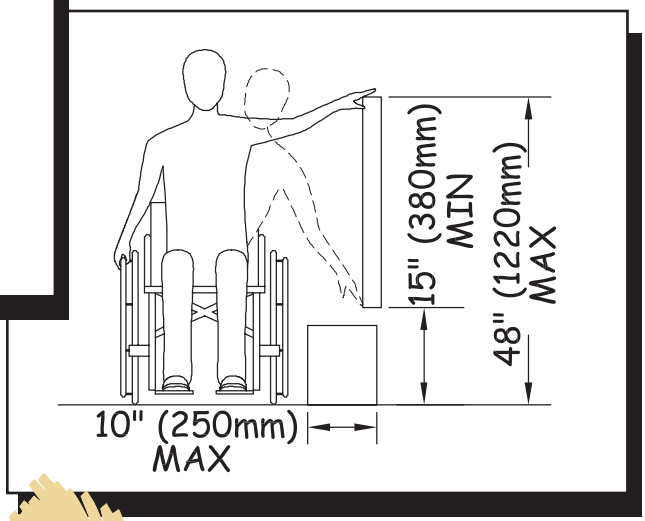


Figure 46—The requirements for unobstructed side reach.

Section 308 of the ABAAS identifies the following reach requirements:

Unobstructed Reaches—Where a forward or side reach is unobstructed, the object to be reached must be no higher than 48 inches (1,220 millimeters) and no lower than 15 inches (380 millimeters) above the floor or ground (see figures 45 and 46). For side reaches only, an object that isn't more than 10 inches (255 millimeters) wide and is below the object to be reached doesn't count as an obstruction.

Obstructed Forward Reach—Where an object must be reached over an obstruction, the clear floor space must extend beneath the obstruction for at least as far as the reach depth over the obstruction. The object to be reached can't be under the obstruction. If the obstruction is 20 inches (510 millimeters) deep or less, the object to be reached must be between the top of the obstruction and 48 inches (1,220 millimeters) above the floor or ground (figure 47). If the obstruction is more than 20 inches (510 millimeters) deep, the object to be reached must be between the top of the obstruction and 44 inches (1,120 millimeters) above the ground or floor (figure 48). The obstruction can't be more than be 25 inches (635 millimeters) deep.

Obstructed Side Reach—For side reaches, obstructions can't be more than 34 inches (865 millimeters) high or 24 inches (610 millimeters) deep. The object to be reached can't be under the obstruction. If the reach depth is 10 inches (255 millimeters) or less, the object to be reached must be 48 inches (1,220 millimeters) or less above the ground or floor (figure 49). If the reach depth is between 10 and 24 inches (255 and 610 millimeters), the object to be reached can't be more than 46 inches (1,170 millimeters) above the floor or ground (figure 50).

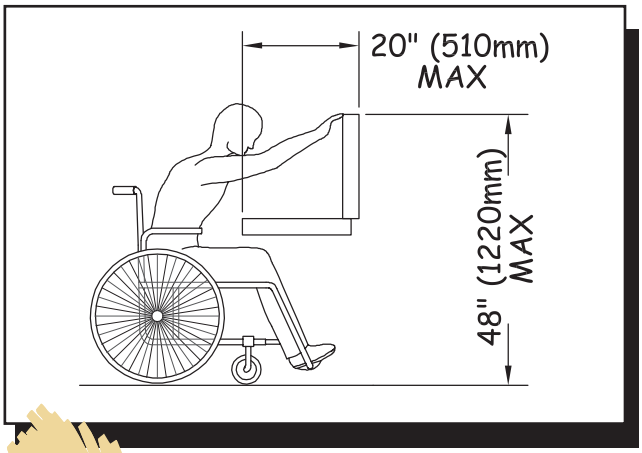


Figure 47—The requirements for obstructed high forward reach, narrower obstacles

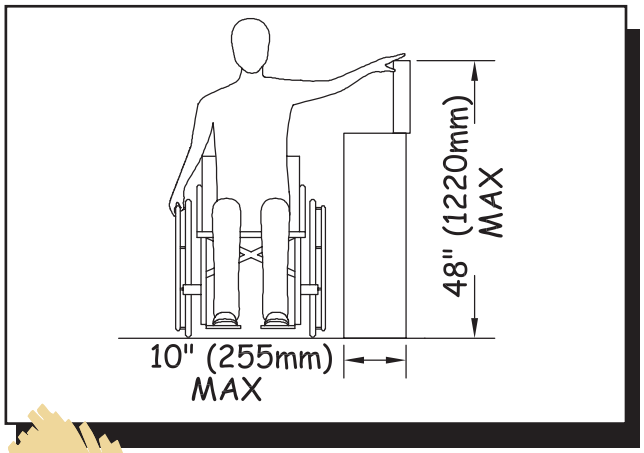


Figure 49—The requirements for obstructed high side reach, narrower obstacles.

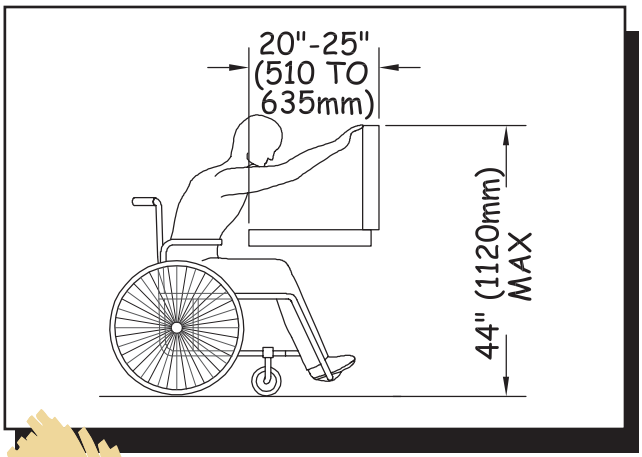


Figure 48—The requirements for obstructed high forward reach, wider obstacles.

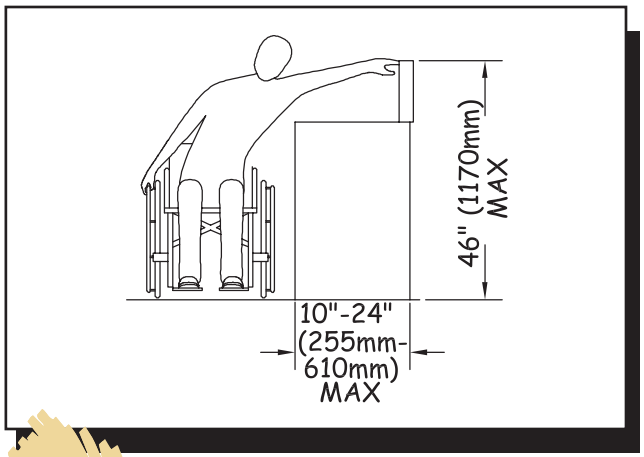


Figure 50—The requirements for obstructed high side reach, wider obstacles.

Grab Bars

Grab bars are usually provided in buildings to provide stability and allow a person to use his or her arms to assist in movement over short distances. The most common location for grab bars is in restrooms. However, grab bars are also necessary at outdoor rinsing showers and at pit toilets that have walls around them. Grab bars must comply with the reach range requirements of ABAAS section 308, as explained in *Reach Ranges and Operability Requirements*. They must also comply with the size, strength, finish, and position requirements in ABAAS section 609, as explained below.

Grab bars with circular cross sections must have a diameter no less than 1¼ inches (32 millimeters) and no more than 2 inches (51 millimeters). Grab bars with noncircular cross sections can't be more than 2 inches (51 millimeters) across and must be 4 to 4.8 inches (100 to 120 millimeters) around. Figure 51 shows how this is measured.

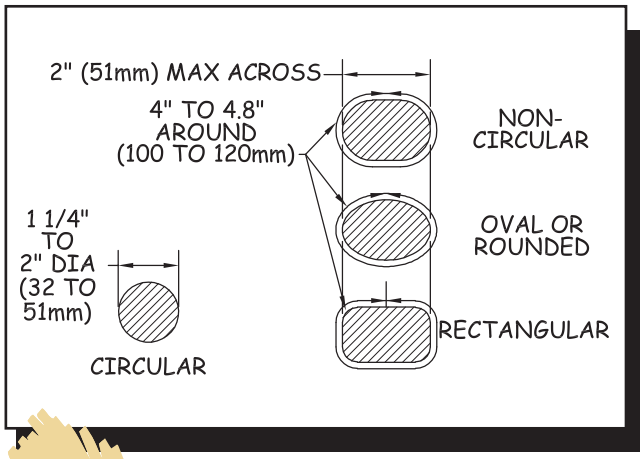


Figure 51—The requirements for the diameter and circumference of grab bars.

The space between the wall and the grab bar must be 1½ inches (38 millimeters). There must also be a space of 1½ inches (38 millimeters) between the grab bar and any projecting objects below or at the ends of the grab bar. There must be at least 12 inches (305 millimeters) between the grab bar and any projecting objects above it, except for shower controls, shower fittings, and other grab bars, which only have to be 1½ inches (38 millimeters) from the grab bar.

Grab bars and any wall or other surfaces adjacent to grab bars must have rounded edges and can't have sharp or abrasive surfaces. Grab bars must be installed so they don't rotate within their fittings. They have to be strong enough to support 250 pounds (1,112 newtons) of pressure at any point on the grab bar, fastener, mounting device, and supporting structure.

More specific location requirements are explained in the sections for *Pit Toilets in General Forest Areas* and *Outdoor Rinsing Showers*.

Constructed Features for Picnic Areas

Three constructed features are addressed in section 4 of the FSORAG—picnic units, picnic tables, and cooking surfaces.

Picnic Units—A picnic unit is a part of a picnic area that contains one or more constructed features used for picnicking by an individual or group separate from other parties using the recreation site. All constructed features provided in a picnic unit must meet the requirements explained below. The size of a picnic unit is determined by the type and number of constructed features provided and the required clear space around each feature.

Where two or more picnic units are provided in a recreation site, at least 20 percent, but never less than two of the units, must be connected by an ORAR to the other major features of the site. In a picnic area with 20 units, for example, all tables, grills, and other features must be accessible, and a minimum of four picnic units must be connected to the other major features at the site by an ORAR.

The 20 percent requirement is a minimum. In the spirit and intent of universal design, designers are encouraged to connect as many units by an ORAR as is feasible, given the specific natural constraints of the site, the level of development, and other considerations.

The FSORAG recognizes that the natural terrain often presents a real obstacle in the outdoor recreation environment. While terrain doesn't affect the accessibility of the constructed features provided in the unit, it could make it difficult to provide an ORAR for the picnic unit. It may not be possible to provide an ORAR for all picnic units without affecting the fundamental nature of the picnic area and the recreation opportunity.

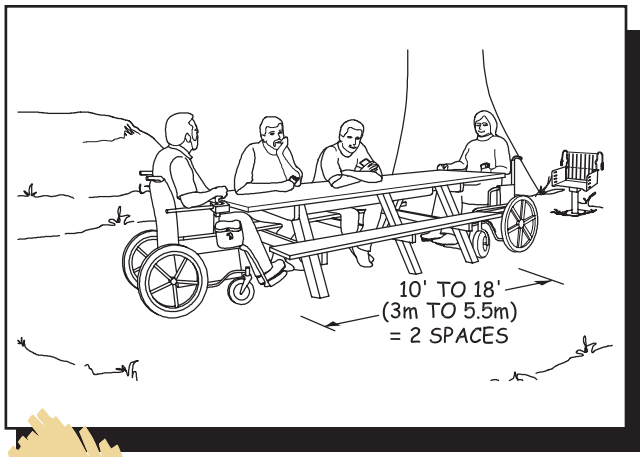


Figure 52— At least two spaces must be accessible at a 10- to 18-foot- (250- to 460- millimeter-) long picnic table.

Picnic Tables—All picnic tables must comply with requirements for accessible seating spaces, table clearance, slope, and surface. At least 20 percent of them must be connected by an ORAR to the other major constructed features at the recreation area. This is the same as, not in addition to, the ORAR connection requirement for picnic units. It is included here to ensure that everyone understands that even if no constructed features are provided other than picnic tables, an ORAR connection is still required. The 20 percent requirement is only a minimum; designers are encouraged to connect more picnic tables where that is feasible. Picnic tables in GFAs don't have to be connected to an ORAR.

Wheelchair seating spaces must be provided based on the length of a picnic table (figure 52). For tables up to 9 feet (2.7 meters) long, one space is required. Tables between 10 feet (3 meters) and 18 feet (5.5 meters) long require two wheelchair spaces, and so on for longer tables.

Knee space for wheelchair seating must be at least 30 inches (760 millimeters) wide, 19 inches (485 millimeters) deep, and 27 inches (685 millimeters) high, as measured from the ground or floor to the bottom of the tabletop. Toe clearance of at least 9 inches (230 millimeters) above the ground or floor must extend at least an additional 5 inches (25 millimeters) beyond the knee clearance. Figure 53 illustrates the required knee and toe space. Toe clearance is required to ensure that someone in a wheelchair is able to sit close to the tabletop, regardless of the design of the picnic table. If the table is constructed with one solid leg on each end, as opposed to an A-shaped frame or two individual legs on each end of the table that would allow the wheelchair to fit in

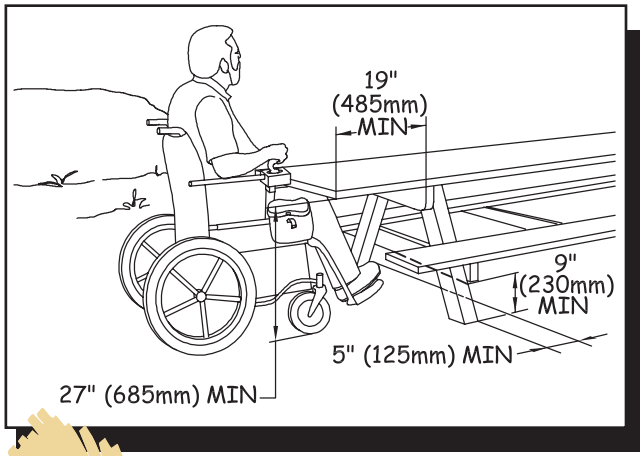


Figure 53—The requirements for knee and toe space at a picnic table.

between, the toes of a person in a wheelchair would hit the table leg at the end of the 19-inch (485-millimeter) knee space. Without the additional 5-inch (25-millimeter) toe clearance, a person in a wheelchair wouldn't be able to get close enough to the tabletop to use it comfortably.

CONSTRUCTION TIP—

Accessible picnic tables

Picnic tables are tricky. Manufacturers often claim their tables are accessible even though they don't meet accessibility requirements. The only sure way to know whether a table is accessible is to check the dimensions.

Figures 54, 55, and 56 show some examples of accessible tables that can be built by contractors or Forest Service crews. Use the links to view or save AutoCAD drawings of the tables.

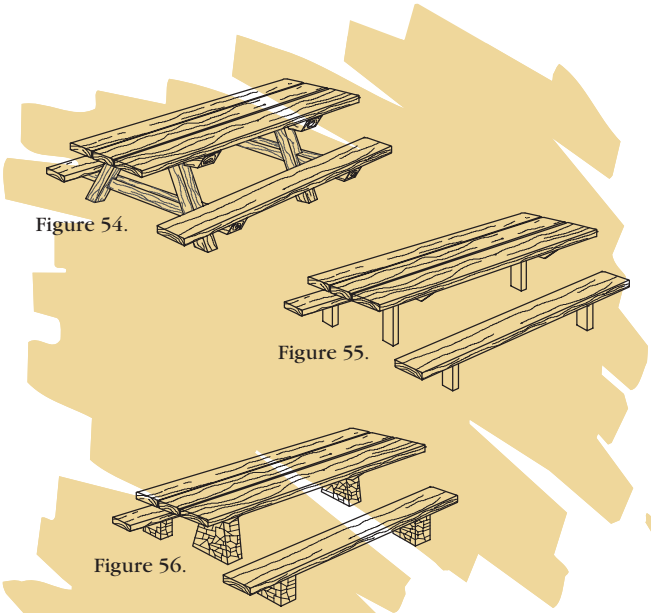


Figure 54, 55, and 56—Three examples of accessible picnic tables. Plans are on the Forest Service's internal computer network at: *http://fsweb.wo.fs.fed.us/eng/facilities/accrec/.*

Clear floor or ground space that is 30 inches by 48 inches (760 millimeters by 1,220 millimeters) must be provided at each wheelchair seating space and must be positioned to accommodate a forward approach to the table (figure 57). No exceptions to the wheelchair seating space requirements are permitted.

DESIGN TIP—

Forward approach and side approach

A forward approach means that the person is facing the object (figure 57). A side approach means that the person is beside the object (see figure 46). People need different-sized spaces to position their wheelchairs if they are in front of an object than if they are beside an object. This is why there are different clear floor or ground space requirements for forward and side approaches.

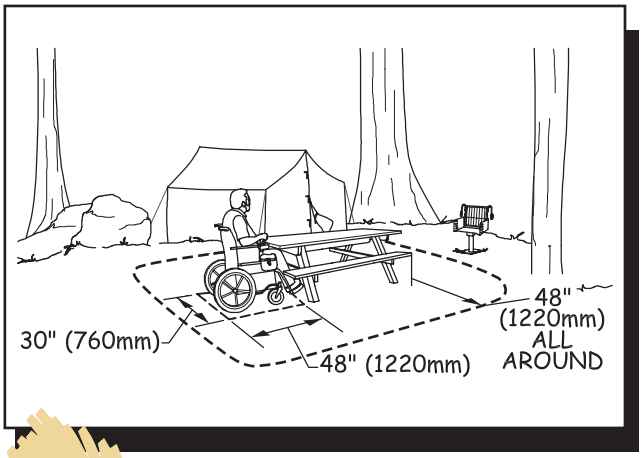


Figure 57—The requirements for clear space at a picnic table.

In addition to the clear floor or ground space for each wheelchair seating space, a 48-inch (1,220-millimeter) clear floor or ground space is required around the usable portions of the table (figure 57). Table clearance is measured from the table seat out. Where a condition for departure exists, the table clearance may be reduced

to 36 inches (915 millimeters). No other exceptions are permitted. The clear space must be adjacent to the ORAR, but it may not overlap the ORAR.

The slope of the required clear floor or ground space for wheelchair seating spaces and for table clearance can't exceed 1:50 (2 percent) in any direction. An exception is provided that permits a maximum slope of 1:33 (3 percent) where surface conditions require a steeper slope for proper drainage. The surface of the clear floor or ground space must be firm and stable. The type of surfacing used should be appropriate to the setting and level of development. There are exemptions from the slope and surface requirements if a condition for departure exists. This is a particularly important exception for GFAs.

Cooking Surfaces, Grills, and Pedestal Grills— Requirements for accessible cooking surfaces, grills, and pedestal grills include cooking surface height, controls, clear floor or ground space, slope, and surface. Figure 58 shows a typical pedestal grill. Each cooking surface, grill, and pedestal grill must comply with these provisions and at least 20 percent of them must be connected to the other major constructed features at the recreation area by an ORAR. This is the same as, not in addition to, the ORAR connection requirement for picnic units. Even if no constructed features other than cooking surfaces are provided, an ORAR connection is still required. The 20 percent requirement is only a minimum; designers are encouraged to connect more cooking surfaces where it is feasible. Connection to an ORAR isn't required for cooking surfaces, grills, and pedestal grills located in GFAs.

The height of the cooking surface must be 15 inches (380 millimeters) to 34 inches (865 millimeters) above the ground or floor surface. This is based on the height for countertops and the minimum low forward reach range in ABAAS. An exception clarifies that this height range doesn't apply to the grill attached to a fire ring because the grill needs to be close to the fire for food to cook properly. More information about fire ring requirements is available in *Fire Rings, Fireplaces, and Wood Stoves*.

CONSTRUCTION TIP—
Installing a pedestal grill

Most pedestal grills have adjustable cooking heights. If grills are installed so that the highest setting is 34 inches (865 millimeters) above the ground, users can lower the grill to a convenient height.

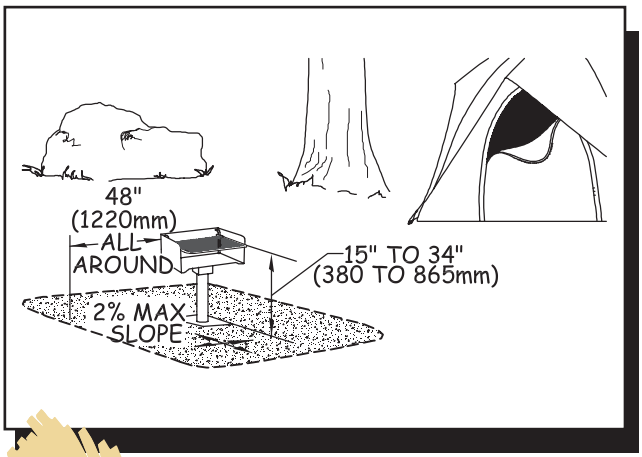


Figure 58—The requirements for height, clear space, and reach range for a pedestal grill.

Controls and operating mechanisms for cooking surfaces, grills, and pedestal grills must comply with the provisions for reach ranges and operability specified in ABAAS sections 308 and 309 and explained in R*each Ranges and Operability Requirements*.

A clear floor or ground space that is at least 48 inches (1,220 millimeters) deep and 48 inches (1,220 millimeters) wide, as measured from the cooking surface, must be provided around all usable portions of the cooking surface (figure 58). If a pedestal grill can rotate 360 degrees and all positions along that rotation are usable,

the 48-inch (1,220-millimeter) clear space must completely surround the grill. An exception permits the clear floor or ground space to be reduced to 36 inches (915 millimeters) if a condition for departure exists. The clear space must be adjacent to the ORAR, but it can't overlap the ORAR. This clear space is required for safety. Restricted maneuvering room could increase the risk of getting burned.

The slope of the clear floor or ground space can't exceed 1:50 (2 percent) in any direction. Where needed for proper drainage, an exception permits the slope to be up to 1:33 (3 percent) in any direction. The surface of the clear floor or ground space must be firm and stable, and the surface material used should be appropriate to the setting and level of development. As with the picnic table, there are exceptions from the slope and surface requirements if a condition for departure exists. This is particularly relevant where cooking surfaces, grills, and pedestal grills are installed in GFAs.

Constructed Features for Campgrounds

The FSORAG section 5 covers constructed features in campgrounds, including camping units, tent pads and platforms, fire rings, wood stoves, fireplaces, utilities, and utility sinks.

Camping Units—A camping unit is a part of a campground that is used by an individual or group for camping separate from other parties using the recreation site. A camping unit commonly includes the camp living area, a parking spur, and a space to pitch a tent (figure 59). The camp living area is the space where tables, fire rings, and grills are located, and is often adjacent to the parking spur. The FSORAG doesn't require a specific number or type of camp units or constructed features, but all camp units and constructed features must meet FSORAG requirements.

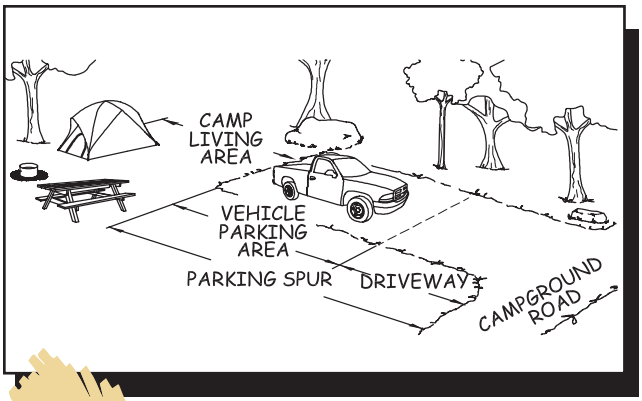


Figure 59—The parts of a camping unit.

Camp Living Areas—The surface of camp living areas must be firm and stable, and the surface material used should be appropriate to the setting and level of development.

Where walk-in camping is provided in a campground, an ORAR must connect the camp living area to the parking spur or parking lot. Depending on the terrain and whether the work is new construction or alteration, this may mean that it won't be possible to comply with the slope requirements for the ORAR to all walk-in units.

Campground Parking Spurs—The parking spur is divided into two parts. The driveway is the section of the parking spur that provides vehicular access and a transition between the campground road and a vehicle parking area. The vehicle parking area is the section of the parking spur where camping vehicles (cars, vans, recreational vehicles, truck and trailer combinations, and so forth) are parked. These definitions are important because the scoping and technical provisions vary based on the specific part of the parking spur being addressed. Figure 60 shows the parts of a parking spur. The surface of the entire parking spur must be firm and stable as explained in the section on *Surfaces for ORARs*.

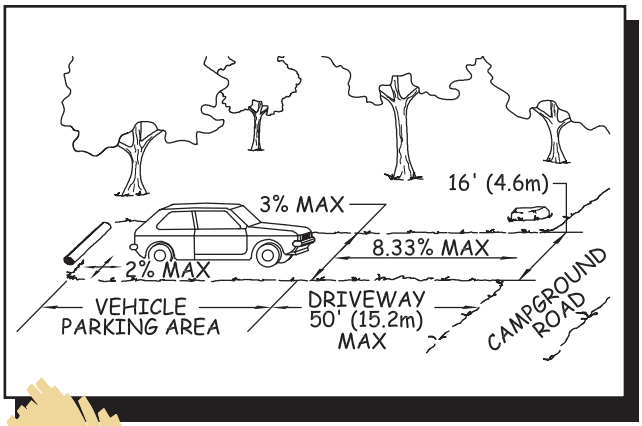


Figure 60—The components of a campground parking spur.

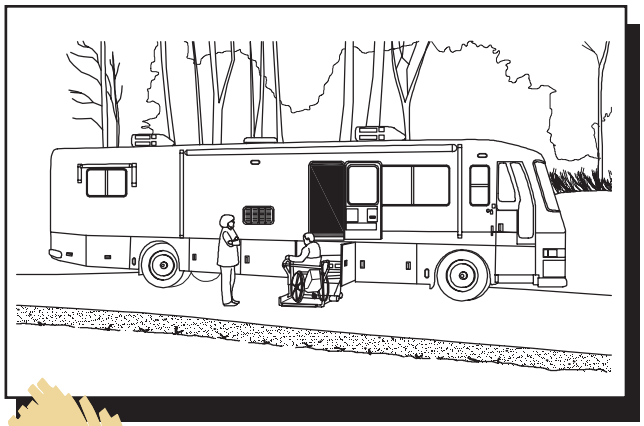


Figure 61—An accessible RV with a lift.

Each vehicle parking area that is adjacent to a camp living area must be at least 16 feet (4.8 meters) wide but the FSORAG also requires that some parking areas be 20 feet (6 meters) wide.

The 16-foot (4.8-meter) width is the same as the standard width for an accessible parking stall for vans. An exception allows this width to be reduced to a minimum of 13 feet (4 meters), the width of an accessible parking space for cars, where a condition for departure exists. Where the parking area can't be made at least 13 feet (4 meters) wide because of a condition for departure, a second exception allows construction of a narrower parking area. However, designers are strongly encouraged to avoid constructing parking areas less than 13 feet (4 meters) wide.

A 16-foot- (4.8-meter-) wide parking area will accommodate cars, vans, and the majority of recreational vehicles (RVs) and trailers. However, an area that is 20 feet (6 meters) wide is required for full-size accessible RVs (figure 61) and trailers. This width is required to accommodate lifts, ramps, and other assistive equipment that allow RV owners to enter, exit, and move around all sides of the vehicle. The dimensions are based on a 8-foot- (2.4-meter-) wide vehicle, an 8-foot- (2.4-meter-) wide space on the passenger side for operation of the lift or ramp with room to maneuver, and a 4-foot- (1.2-meter-) wide clear space along the driver's side.

To maximize accessibility while protecting the natural environment, only a limited number of vehicle parking areas must be 20 feet (6 meters) wide. The number of required 20-foot- (6-meter-) wide vehicle parking areas is based on the total number of camping units provided in the campground (table 2).

Table 2—The number of 6-meter- (20-foot-) wide vehicle parking areas required in campgrounds of different sizes.

Number of camping units	Minimum number of accessible recreational vehicle and trailer parking areas
1	1
2 to 25	2
26 to 50	3
51 to 75	4
76 to 100	5
101 to 150	7
151 to 200	8
201 to 300	10
301 to 400	12
401 to 500	13
501 to 1,000	2 percent of total
1,001 and over	20 plus 1 for each 100 over 1,000

For example, if a 50-unit campground is being designed, a minimum of two vehicle parking areas must be 20 feet (6 meters) wide. The vehicle parking areas for the remaining 48 camping units must be at least 16 feet (4.8 meters) wide, with the exceptions noted above. This is similar to the approach used by ABAAS for accessible hotel rooms. The minimum required number of accessible rooms is proportional to the total number of rooms in the hotel. Similarly, the minimum number of accessible vehicle parking areas is proportional to the total number of vehicle parking areas.

DESIGN TIP—

Parking for walk-in camping units

For walk-in camping units, the required parking space width depends on whether the parking space is part of the camping unit or is a separate parking area. If the walk-in unit has its own parking spur, then it falls under the FSORAG parking spur requirements, and the parking area should be 16 feet (4.8 meters) wide as required by the vehicle parking area provision, or less if an exception applies. If the parking space is part of a group parking area such as a 10-car parking lot that is provided for 8 walk-in units, the whole parking area must meet the requirements of ABAAS sections F208 and 502. For the parking lot above, nine parking spaces would be 10 feet (3 meters) wide, and one would be 16 feet (4.8 meters) wide.

There are separate slope requirements for vehicle parking areas and driveways because of the different functions they perform. The slope of the vehicle parking area can't exceed 1:50 (2 percent) in any direction. However, where needed for proper drainage, an exception permits the slope to be up to 1:33 (3 percent) in any direction.

The running slope of a parking spur driveway may be up to 1:12 (8.33 percent) for 50 feet (15 meters). An exception for areas of steeper terrain permits the running slope to be up to 1:10 (10 percent) for 30 feet (9 meters). In alterations of existing campgrounds only, a second exception permits the running slope to be up to 1:10 (10 percent) for distances up to 50 feet (15 meters) if the first exception cannot be met because of a condition for departure. This second exception does not apply to new construction.

The cross slope of a parking spur driveway must not exceed 1:33 (3 percent). An exception permits a cross slope up to 1:20 (5 percent) if needed for proper drainage and to provide a transition from the campground road to the vehicle parking area. For example, if a back-in parking spur is adjacent to an interior campground road that has a running slope steeper than 1:20 (5 percent), the driveway may have to have a steeper cross slope to make the transition from the running slope of the road to the relatively level vehicle parking area (figure 62).

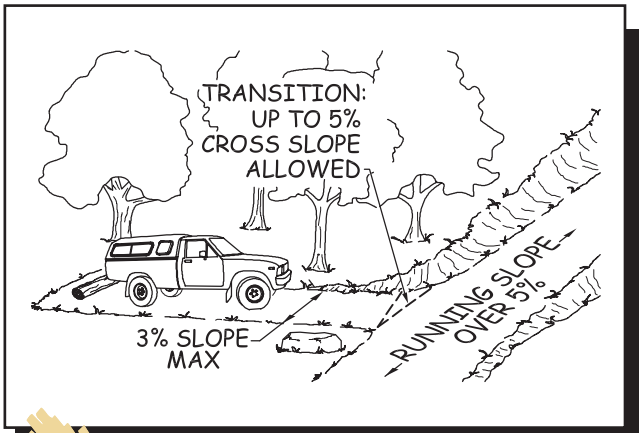


Figure 62—The transition from a parking spur driveway to a campground road.

DESIGN TIP—
Pedestrians in the driveway

Do the running and cross slope requirements sound familiar? They should! Because people move around the vehicle parking areas and along the driveways, parking spurs also have to be able to function as ORARs, so the requirements are similar to those for ORARs.

The running and cross slopes of the driveway, even in alterations, should be kept as gentle as possible so that vehicles and people can easily and safely navigate into and out of the camping unit, erosion is minimized, and road design and construction standards are met.

Parking Spurs for Double Camp Units—If a double parking spur is provided to accommodate two accessible recreational vehicles at a double camping unit, the total width of the combined vehicle parking area may be reduced from 40 feet (12 meters) to 36 feet (11 meters).

DESIGN TIP—
How long should the parking area be?

The FSORAG has requirements for parking space or spur width, but not length. So, how long should each parking area spur be? That depends on the type of vehicle that is expected to use the parking area and the terrain. Ordinary parking lots are normally designed with 20-foot (6-meter) long parking spaces to accommodate passenger vehicles, so parking areas should be at least 20 feet (6 meters) long. A large trailer with a towing vehicle could be up to

Continued

60 feet (18.3 meters) long and a bus-style RV could be up to 45 feet (13.7 meters) long.

Some campgrounds include parking spurs of various lengths. This limits campsite choices for campers with larger trailers or RVs, but also keeps costs lower and minimizes hardened surfaces and ground disturbance, especially on difficult terrain. Campers with larger trailers and RVs appreciate having information available online and at the campground about the length of parking spaces.

Camp Unit Identification—People need to know whether they will be able to use a particular campsite. This can be accomplished differently, depending on the type of campground. If all camping units are accessible, no posted identification is required.

If some—but not all—campsites are accessible and campers choose their campsite when they arrive at the campground, accessible camping units must be identified at the campground's entrance kiosk, fee station, bulletin board, or registration area. Accessible campsites should not be individually signed as accessible with the International Symbol of Accessibility, because that tends to stigmatize and draw attention to those sites. Instead, include the following type of statement on the registration information sign: *Units 2, 4, 6, and 10 are accessible. If no one in your group needs accessible campsites, please fill these units last.* Forests that have been using this type of statement on the registration sign report that visitors generally have complied.

If some—but not all—campsites are accessible and each camping unit is assigned through a reservation system that contains accessibility information or if the campsite is assigned by someone who can provide information about each unit, accessibility information doesn't have

to be posted. The accessible units should be assigned as needed to individuals with disabilities. The accessible campsites that are not assigned to persons with disabilities should be filled last, keeping them available in case they are needed.

Camp Unit Tent Pads and Tent Platforms—At least 20 percent of the total number of tent pads or tent platforms provided in a recreation site must meet the requirements below and be connected to the other major constructed features at the recreation area by an ORAR.

A minimum 48-inch (1,220-millimeter) **clear floor** or **ground space** must be provided on all sides of the tent on tent pads and platforms that are required to be accessible. An exception permits this width to be reduced to a minimum of 36 inches (915 millimeters) where a condition for departure exists. When tent pads or platforms are provided in recreation sites, the clear space must be adjacent to the ORAR, but it may not overlap the ORAR.

There is no minimum tent pad size because the types of tents commonly used in recreation sites and in GFAs vary widely in different parts of the country and even in different parts of a single district. For example, at a campground near a wilderness access point, small tents may be used. Large family tents may be common at a more developed campground with numerous constructed features for campers.

Local campground managers are the best source of information about the size of tents commonly used in an area. Adding the 48-inch (1,220-millimeter) or 36-inch (915-millimeter) clear space to the size of a typical tent will determine the minimum size of tent pads and platforms for that campground. Designers may want to provide a range of tent pad or platform sizes to accommodate a variety of tents.

In GFAs, 5 percent of the total number of tent pads or platforms must meet the requirements, but connection to an ORAR isn't required. Because most facilities provided in GFAs are for resource protection rather than for visitor convenience, the requirements are reduced to minimize alteration of the site and setting, while integrating accessibility.

For instance, it isn't unusual to find six or seven tents close together in a GFA. Typically, the spaces allotted for these tents are about 10 by 12 feet (3 by 3.6 meters), which would easily accommodate a 5- by 8-foot (1.5- by 2.4-meter) tent. An accessible pad for the same size tent with a 4-foot (1.2-meter) clear space all around would need to be at least 13 by 16 feet (4 by 4.8 meters). If all tent spaces were required to meet the FSORAG's technical provisions, a significantly larger area would be affected by the tent pads.

The **slope of an accessible tent pad or platform** can't exceed 1:50 (2 percent) in any direction. An exception permits the slope to be up to 1:33 (3 percent) maximum where needed for proper drainage. Figure 63 shows the required dimensions and slopes for tent pads and platforms.

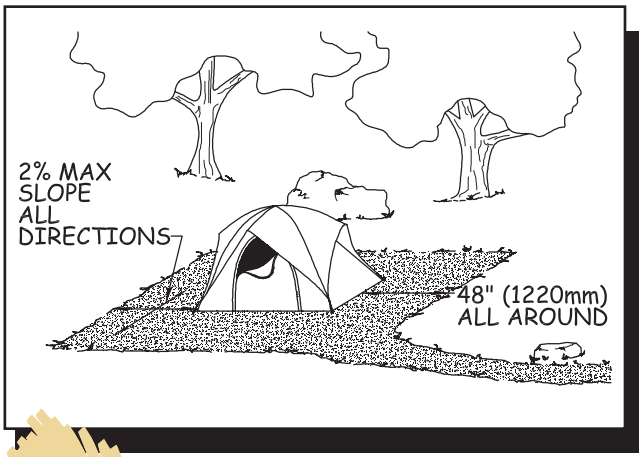


Figure 63—The requirements for a tent pad.

The **surface of an accessible tent pad or platform** must be firm and stable, be able to accommodate the use of tent stakes or other devices to secure the tent, and should be of a material that is appropriate for the level of development and setting. An exemption to the surfacing provision is allowed where a condition for departure exists.

The FSORAG doesn't require **edge protection** on tent platforms. However, if designers and managers determine that edge protection is needed for safety or other reasons, it must be at least 3 inches (75 millimeters) high. If edge protection is provided, it must not be placed where it would block access to the platform.

Accessible tent platforms are sometimes at ground level and sometimes above ground level. The ORAR should connect to ground-level tent platforms at ground level. For above-grade platforms, there are two choices. The ORAR can either ramp up to platform level, or it can end adjacent to the tent platform at 17 to 19 inches (430 to 485 millimeters) lower than the platform. This height is suitable for transferring from a wheelchair to the platform. Figure 64 shows a solution for providing an accessible tent platform in a highly developed campground.

Figure 64—A tent platform in a highly developed campground at the Coronado National Forest.

Fire Rings, Fireplaces, and Wood Stoves—Although these features are addressed in separate sections of the FSORAG, they are discussed together here because their provisions are quite similar. Where fire rings and wood stoves are provided, each one must meet the requirements explained below. When fire rings and wood stoves are provided in recreation sites, an ORAR must connect them to the other major constructed features at the recreation area. An ORAR isn't required for fire rings, fireplaces, and wood stoves in GFAs.

The fire-building surface within a fire ring must be a minimum of 9 inches (230 millimeters) above the floor or ground surface. This matches the low side reach range in ABAAS. An exemption from the 9-inch (230-millimeter) height requirement is allowed where a condition for departure exists. This exception is included particularly for fire rings provided in GFAs and wilderness areas.

For example, in the Boundary Waters Canoe Area Wilderness, some fire rings created by users at popular campsites are allowed to remain (rather than being dismantled) to reduce the chance that campfires might become wildfires. Often these fire rings are simple circles of rocks that can be considered temporary structures appropriate in the wilderness setting. A fire-building surface 9 inches (230 millimeters) above the ground would require higher sides and a permanent structure that would be inappropriate in a wilderness setting.

Some outdoor fireplaces and custom-built fire rings have a wall around the fire-building area, perhaps built out of bricks or mortared stone. In addition to the requirement for a fire-building surface that is at least 9 inches (230 millimeters) above the ground or floor, the distance a person would have to reach across the wall and down to the fire-building surface cannot exceed 24 inches (610 millimeters). Figures 65 and 66 illustrate this requirement.

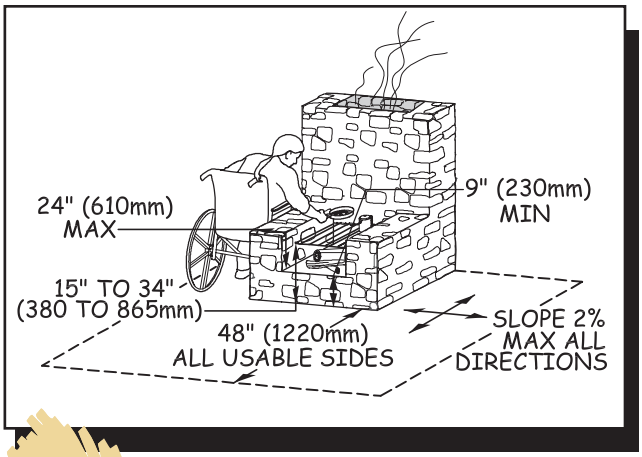


Figure 65—The height, clear space, and reach range requirements for an outdoor fireplace.

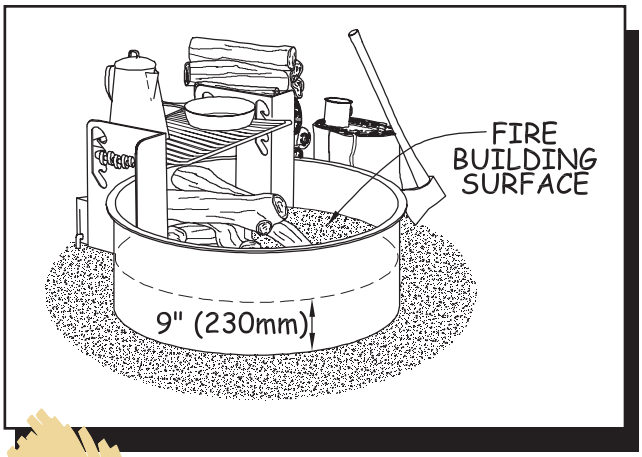


Figure 67—The height and reach requirements for manufactured steel fire rings.

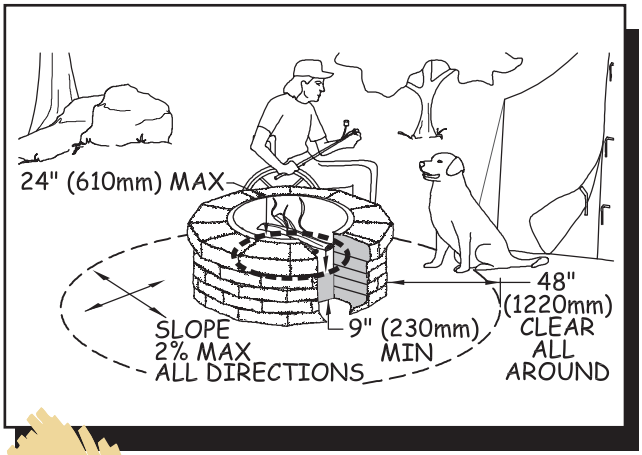


Figure 66—The height and reach requirements for custom fire rings.

This provision normally doesn't affect standard, commercially manufactured fire rings that are common in campgrounds, such as the fire ring shown in figure 67. The material used to fabricate commercial fire rings usually is not very thick or wide, so the reach to the fire-building surface is normally less than 24 inches (610 millimeters).

All usable portions of a fire ring, fireplace, or wood stove must have a clear floor or ground space that extends at least 48 inches (1,220 millimeters) out from the ring or stove and is at least 48 inches (1,220 millimeters) wide. An exception allows this space to be reduced to 36 inches (915 millimeters) minimum where a condition for departure exists. The clear space must be adjacent to the ORAR, but it may not overlap the ORAR. The clear space is required for safety so that someone isn't forced to get too close to the heat or fire and risk getting burned.

The slope of the clear floor or ground space around a fire ring, fireplace, or wood stove may not exceed 1:50 (2 percent) in any direction. Where required for proper drainage, an exception permits the slope to be up to 1:33 (3 percent) in any direction. The surface of the clear floor or ground space must be firm and stable. Exemptions from the slope and surface requirements for fire rings, fireplaces, and wood stoves are allowed where a condition for departure exists. The exceptions are particularly relevant for fire rings provided in GFAs.

Controls and operating mechanisms for a wood stove must comply with the provisions for reach ranges and operability specified in ABAAS sections 308 and 309 and explained in *Reach Ranges and Operability Requirements*.

Utilities—Electricity, drinking water, sewer, and other utilities that are provided in recreation sites must meet the requirements explained below.

Controls and operating mechanisms for utilities must comply with the provisions for reach ranges and operability specified in ABAAS sections 308 and 309 that are explained in *Reach Ranges and Operability Requirements*. Sewage hookups don't have to comply with the reach ranges of ABAAS section 308 or operation requirements of section 309, but the slope and surface requirements must still be met.

A clear floor or ground space of at least 30 by 48 inches (760 by 1,220 millimeters), oriented for front or side approach to all usable sides of utilities must be provided, except at water hydrants, which have their own requirements that are explained below. The clear floor or ground space around utilities may overlap adjacent clear spaces. Figures 68 and 69 illustrate this requirement.

The slope of the clear spaces required at utilities and water hydrants can't exceed 1:50 (2 percent) in any direction. The slope can be up to 1:33 (3 percent) maximum in any direction, if required for proper drainage. The surface of the clear space must be firm and stable and of a material that is appropriate to the level of development and setting.

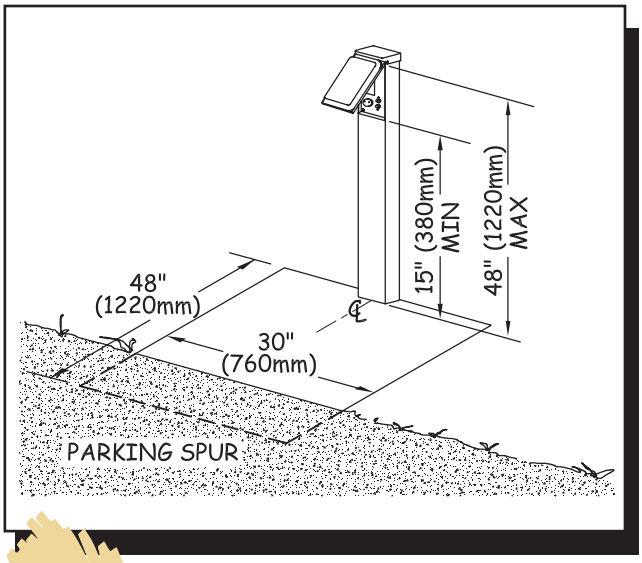


Figure 68—The requirements for campground utilities are illustrated by this electrical connection.

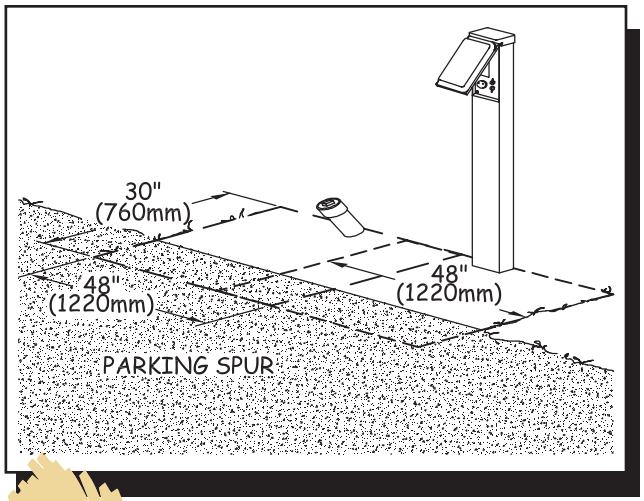


Figure 69—The clear space for utilities can overlap at campsites.

Water Hydrants—Water hydrants are the outdoor devices from which people obtain drinking water, and include water faucets on posts and hand pumps. They must be between 28 inches (710 millimeters) and 36 inches (915 millimeters) above the ground or floor surface on the edge of a clear space that is at least 60 by 60 inches (1,525 by 1,525 millimeters). This permits a forward or side approach to the hydrant and allows enough room for someone in a wheelchair to turn around and leave.

If the hydrant is an unusual design with the handle and spout on different sides of the post, be sure that people can access both sides. The required clear space must be adjacent to the ORAR, but it may not overlap the ORAR. In addition, if drainage grates are provided, the openings in the grate must comply with the ORAR provision for openings. Figure 70 illustrates these requirements.

While the controls for a hydrant must comply with the provisions for reach ranges and operability specified in ABAAS sections 308 and 309 and explained in the section on Reach Ranges and Operability Requirements, hand pumps are exempt from this requirement. Standard hand pumps require a force greater than 5 pounds (2.2

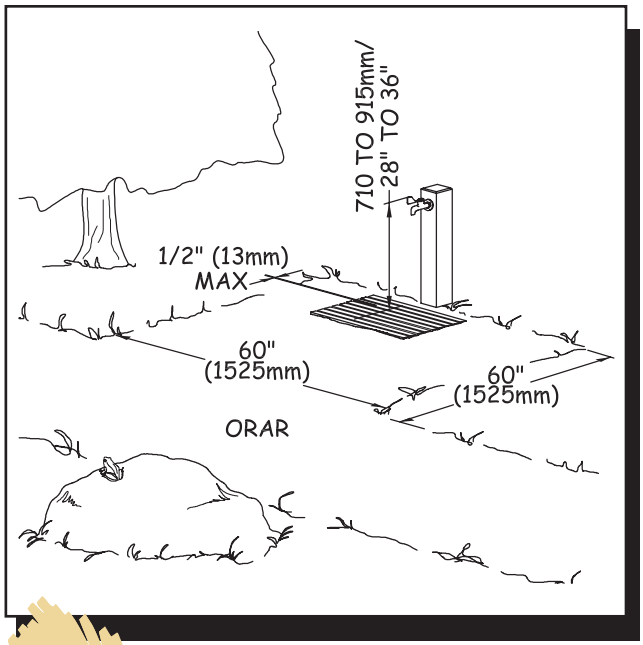


Figure 70—The requirements for water hydrants.

Figure 71—This accessible handpump is operated by a crank, making it possible for almost everyone to draw water independently.

newtons) and a long reach to operate. Until hand pumps are available that can meet the accessibility standard for operating controls, while adequately accessing the water supply, hand pump operating controls are exempt from this requirement.

The Forest Service's Technology and Development program has produced an accessible hand pump that can be used where the well is 40 feet (12 meters) deep or less. This pump should be used for new or replacement shallow-well installations where the accessible pump meets the technical specifications for the water supply. Information about the commercially manufactured accessible hand pump (figure 71) is available at: *http://www.fs.fed.us/t-d/programs/eng/handpump.htm* (Username: t-d Password: t-d). The tech tip, *New Accessible Handpump for Campgrounds*, also has information about the commercially manufactured accessible handpump. The tech tip is available on the Internet at: *http://www.fs.fed.us/t-d/pubs/htmlpubs/htm05712311/* (Username: t-d, Password: t-d).

Utility Sinks—A utility sink is deeper than a standard restroom basin or kitchen sink and can be used to clean large pots or equipment. Usually, utility sinks are provided only in highly developed recreation areas. At least one of each type of sink provided in each accessible room or space and at least 5 percent of the total number of utility sinks must comply with the requirements explained below.

Clear floor or ground space that is at least 30 inches (760 millimeters) by at least 48 inches (1,220 millimeters) must be provided at each accessible utility sink and be oriented for either a forward or side approach. These requirements are identical to the requirements in ABAAS sections 305.3 and 305.5. The clear space at the utility sink must be connected to an ORAR, but it can't overlap the ORAR. The slope of the clear floor or ground space can't exceed 1:50 (2 percent) in any direction, although an exception permits a slope up to 1:33 (3 percent) in any direction where needed for proper drainage. The surface of the clear floor or ground space must be firm and stable and of a material that is appropriate for the setting and level of development.

The height of the counter or rim surrounding the sink can't be more than 34 inches (865 millimeters) above the ground or floor space. The bottom of the bowl must be at least 15 inches (380 millimeters) above the ground or floor space. If hot water is provided, the pipes should be wrapped or shielded to prevent someone from accidentally touching the hot pipes. Sink controls and operating mechanisms must comply with the provisions for reach ranges and operability specified in ABAAS sections 308 and 309 and explained in *Reach Ranges and Operability Requirements*. Figure 72 illustrates these requirements.

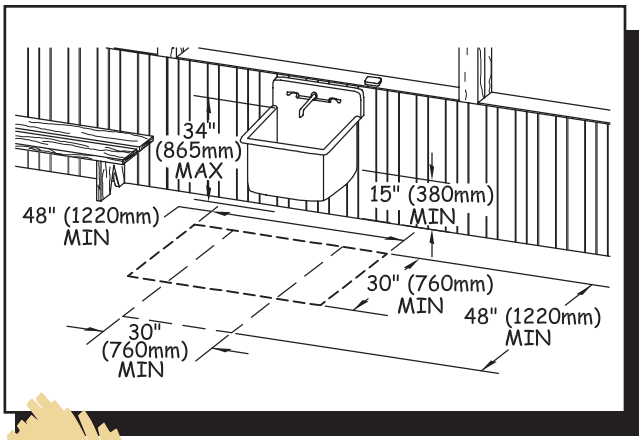


Figure 72—The requirements for utility sinks.

Other Constructed Features

Section 6 of the FSORAG addresses miscellaneous constructed features that may be provided in recreation sites and other recreation areas. These features include **benches, trash and recycling containers, viewing areas at overlooks, telescopes and periscopes, storage facilities for assistive devices, pit toilets in GFAs, warming huts, outdoor rinsing showers,** and **signs**.

Benches—Each bench that is provided in a recreation site must meet the provisions explained below and be connected to the other major features of the recreation area by an ORAR. Benches that are provided in GFAs must meet the requirements, but they do not have to be connected to an ORAR.

DESIGN TIP—

What about inside benches?

Remember that the FSORAG covers outdoor recreation areas. The FSORAG requirements for benches don't apply to benches inside buildings. Built-in benches that are provided inside buildings are covered by ABAAS sections F221.2.1.1, F21.2.2, and 903, even if the buildings are in recreation areas.

The front edge of the bench seat must be between 17 and 19 inches (430 and 485 millimeters) above the ground or floor space. When more than one bench is provided in a common area such as a campground amphitheater or a scenic overlook, at least half of the benches must have back support that runs the full length of the bench.

One armrest must be provided on at least half of the benches with backrests. Consider the visitors who will use a particular area when deciding where to locate an armrest. For people who have difficulty standing up from a seated position, having an armrest can be helpful. Armrests on both ends of the bench could prevent a person using a wheelchair from being able to transfer onto the bench.

A compromise design is a bench with a backrest and one armrest placed in the middle of the bench. Figure 73 shows a bench that meets these requirements. Another option is to place a single armrest on the end of the bench farthest from the clear floor or ground space.

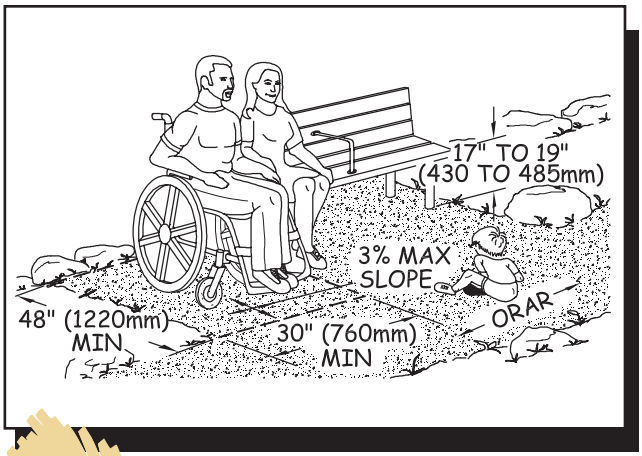


Figure 73—The requirements for benches.

All parts of the bench must be able to withstand 250 pounds (1,112 newtons) applied vertically or horizontally at any point of the seat, fastener, mounting device, or supporting structure. This requirement is the same as the ABAAS requirement for bench strength in section 903.6.

A clear floor or ground space that is 30 by 48 inches (760 by 1,220 millimeters) must be provided adjacent to one end of each bench. This clear space can't overlap the ORAR. The slope of the clear floor or ground space can't exceed 1:33 (3 percent) in any direction. The surface must be firm and stable and made from a material that is appropriate to the setting and level of development. Exceptions to the slope and surface requirements are allowed if a condition for departure exists. These exceptions may be particularly applicable to benches provided in GFAs.

Trash, Recycling, and Other Essential Containers—Many recreation areas have trash and recycling containers for visitor convenience, to protect the environment, or to discourage visits to the area by wild animals. Some campgrounds also provide bear-resistant food storage containers. Each container must meet the requirements explained below. When containers are provided in a recreation site, they must be connected to the other major features of the recreation area by an ORAR. Connection to an ORAR isn't required for containers provided in GFAs.

In a multibin container, only half the containers for each purpose must meet the accessibility requirements. For example, if a trash container has four separate compartments, only two of the compartments are required to meet the technical provisions. But all the bins of a recycling container with four separate bins to collect four different types of recyclable materials must meet the requirements. Figure 74 illustrates these requirements.

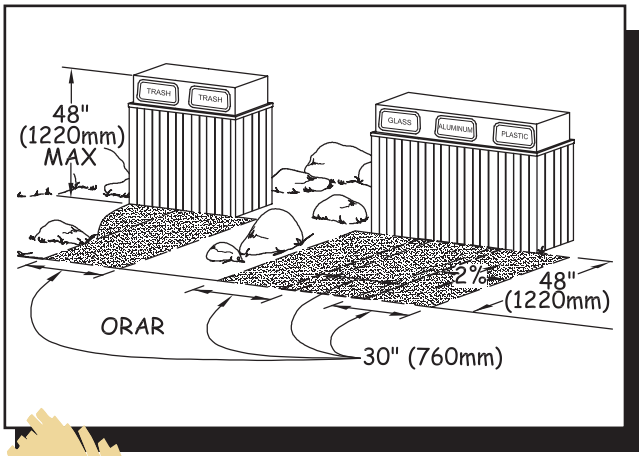


Figure 74—The requirements for trash and recycling containers.

A 30- by 48-inch (760- by 1,220-millimeter) clear floor or ground space positioned for a forward or side approach is required at each container. The clear space must be adjacent to the ORAR, but it can't overlap. The slope of the clear space must not be steeper than 1:50 (2 percent) in any direction. A 1:33 (3 percent) slope is allowed where necessary for drainage. The surface must be firm and stable and made from a material that is consistent with the setting and level of development. The slope, surface conditions, and ORAR connection requirements don't have to be met for containers in GFAs if there is a condition for departure.

Controls and operating mechanisms for containers must comply with the provisions for reach ranges and operability specified in ABAAS sections 308 and 309 and explained in *Reach Ranges and Operability Requirements*.

An exception is allowed for lids and controls designed to deter large animals, such as grizzly bears (figure 75). Large animals, especially bears, pose a real threat to humans when they become accustomed to wandering through recreation sites in search of food. Containers equipped with accessible controls and operating mechanisms are easy targets for hungry bears. The potential for unpleasant encounters between humans and bears increases if bears regard these containers as outdoor buffets. Containers in recreation areas where bears and other large animals pose a risk to humans don't have to comply with accessibility provisions for operating controls until containers are available that do so while meeting the requirements for bear control.

Figure 75—Grizzly bears have the power and persistence to get food that is not secured properly.

Viewing Areas at Overlooks—Overlooks and viewing areas are designed and constructed to provide an unobstructed view of a vista or of a specific point of interest, such as the view of a mountain range, a valley, a waterfall, or a unique geologic formation (figure 76). Because overlooks and viewing areas are a destination point, they must be accessible so all visitors can enjoy the viewing opportunities. Each viewing area at an overlook is required to comply with the requirements explained below.

Figure 76—The overlook on the San Juan Skyway scenic byway in Colorado allows all visitors to enjoy the view.

When viewing areas are provided in recreation settings, they must be located along an ORAR that connects to the other major features at the area. Connection to an ORAR isn't required where viewing areas are provided in GFAs. If several viewing areas are provided, at least one unrestricted viewing opportunity for each distinct point of interest must be accessible.

An unrestricted viewing opportunity means a clear field of vision toward the vista or point of interest that extends from 32 to 51 inches (815 to 1,295 millimeters) above the floor or ground of the viewing area. Compliance with the requirements isn't mandatory where a condition for departure exists.

Viewing areas often are adjacent to hazardous dropoffs. Barriers such as walls, safety rails, or signs installed for safety reasons could block views. This doesn't mean that either accessibility or safety measures should be ignored! Designers need to consider different ways of providing for safety without blocking the view. For example, see-through panels or screened openings could be installed, or the designer may be able to build the overlook with a series of tiers or terraces (figure 77). The placement

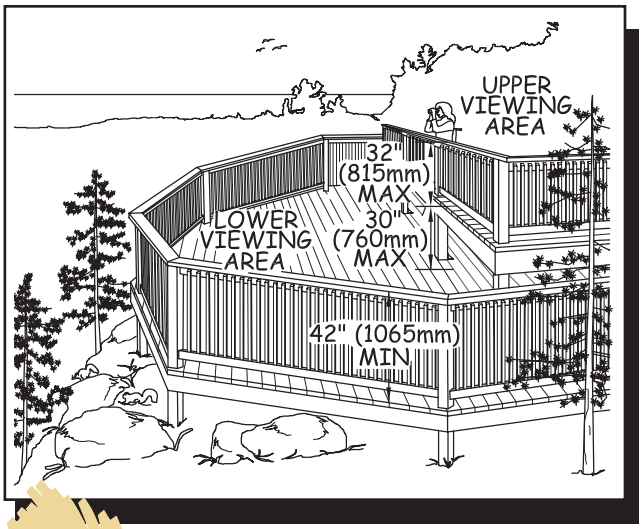


Figure 77—This overlook has two levels so the railing can be lower at the upper viewing area.

of interpretive signs may also help create a barrier to keep people back from the edge of the overlook without encroaching on the 32- to 51-inch (815- to 1,295-millimeter) clear field of vision (figure 78).

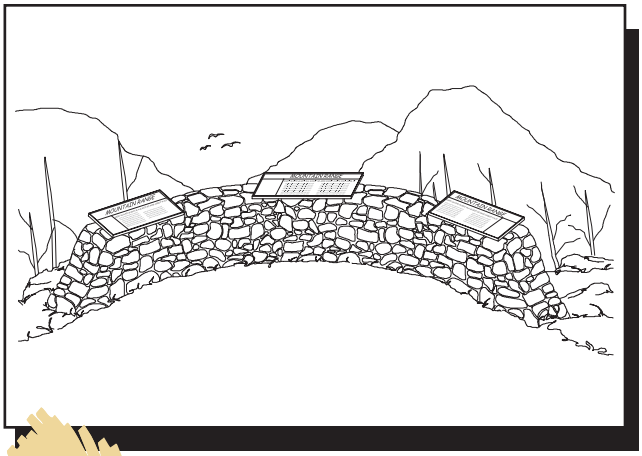


Figure 78—Signs placed to create a barrier at an overlook.

DESIGN TIP—

Railing design

Providing safety while maximizing viewing opportunities is a challenge for those designing a railing or structure adjacent to a dropoff. It's possible to design two viewing levels (see figure 77), where the lower level would be less than 30 inches (760 millimeters) below the upper level.

With this design, a tall guardrail isn't required for the upper level. At the upper level, where the visitors generally approach the viewpoint, a low railing or wall can permit good visibility. The lower viewing level would have a tall guardrail meeting the International Building Code requirements. This lower level provides the "catch" area for the primary level.

If the area or structure doesn't lend itself to a two-level approach, a see-through 42-inch- (1,065-millimeter-) high railing may work (figure 79). The vertical rails should be placed so that a 4-inch (100-millimeter) sphere can't pass through them. Visibility through this type of railing is excellent. The eye level of most adults seated in a wheelchair is above 42 inches (1,065 millimeters), and children sitting on the deck can enjoy the view through the rails.

The importance of vertical rather than horizontal rails can't be overemphasized. When children see horizontal rails, they regard them as an inviting ladder that encourages them to climb. The guardrail can't protect them from a fall when they do so (figure 80).

Figure 79—This railing is safe, meets code requirements, and provides a great view, even when you look through the rails.

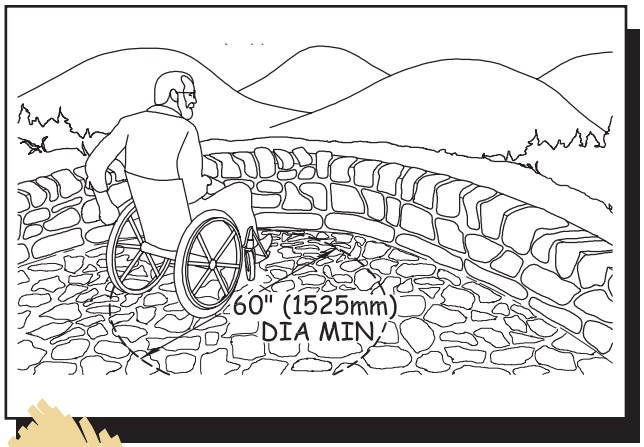


Figure 81—The requirements for turning space at a viewing area.

Figure 80—Caution: railings with horizontal rails make an inviting ladder for small children.

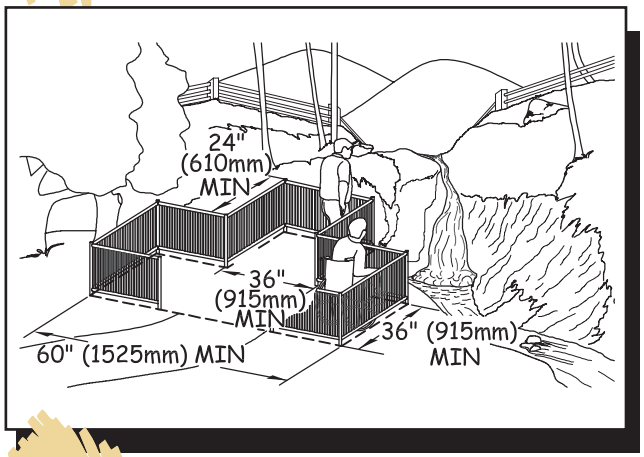


Figure 82—The requirements for a "T" turning space at a viewing area.

At least one turning space at least 60 inches (1,525 millimeters) in diameter (figure 81) or "T" shaped with a minimum 60- by 36-inch (1,525- by 915-millimeter) "arm" and a minimum 36-inch- (915-millimeter-) wide by 24-inch- (610-millimeter-) long "base" (figure 82) must be provided at each accessible viewing area. This requirement is the same as ABAAS section 304.3. This space allows someone using a wheelchair or other assistive device to approach and move about the viewing area. The slope must not exceed 1:50 (2 percent) in any direction, but may be up to 1:33 (3 percent) in any direction where required for proper drainage. The surface should be firm and stable and of a material that is appropriate to the setting and level of development. Exemptions are allowed from slope or surface provisions where a condition for departure exists.

Telescopes and Periscopes—Viewing areas are sometimes equipped with mounted telescopes or periscopes to provide the visitor with a closer view of a point of interest. If one telescope or periscope is provided in a recreation site, it must meet the requirements explained below and be usable from both standing and seated positions. If several are provided, at least 20 percent of them must comply with the provisions of this section.

Accessible telescopes and periscopes must be connected to an ORAR. There is no exception to the ORAR requirement because telescopes and periscopes aren't provided in GFAs.

Controls and operating mechanisms for accessible telescopes and periscopes must comply with the provisions for reach ranges and operability specified in ABAAS sections 308 and 309 and explained in *Reach Ranges and Operability Requirements*. The eyepiece of an accessible telescope or periscope must be usable from a seated position for viewing each point of interest. Many existing telescopes and periscopes are only usable from a standing position. Requiring the eyepieces of accessible telescopes and periscopes to be usable from a seated position will provide the widest range of viewing opportunities not only for seated individuals, but also for children and people of short stature. Alternatives for meeting this requirement include an adjustable scope mount, a swivel seat, or installation of duplicate scopes mounted at different heights. Figure 83 shows one way to configure an accessible telescope area.

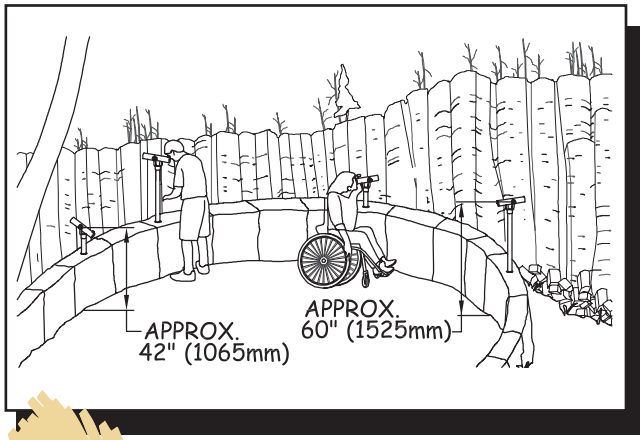


Figure 83—The requirements for telescopes and periscopes.

Turning space must be provided at all accessible telescopes and periscopes so that someone using a wheelchair or other assistive device can approach and move around them. This maneuvering space must be at least 60 inches (1,525 millimeters) in diameter (see figure 81) or "T" shaped with a minimum 60- by 36-inch (1,525- by 915-millimeter) "arm" and a minimum 36-inch- (915-millimeter-) wide by 24-inch- (610-millimeter-) long "base" (figure 82). This requirement is the same as ABAAS section 304.3.

The slope of the maneuvering space can't exceed 1:50 (2 percent). However, a slope of up to 1:33 (3 percent) in any direction is allowed where required for proper drainage. The surface of the maneuvering space must be firm and stable, and made from a material that is appropriate to the level of development and setting.

Storage Facilities for Assistive Devices—Storage for assistive devices is required when individuals using a wheelchair or other assistive device must transfer to another device or vehicle to participate in the services or programs offered at a recreation site. For instance, at ski areas, people who use wheelchairs typically transfer to some type of adaptive ski equipment. They need to store their wheelchairs safely while they're out skiing. Each storage facility for assistive devices such as wheelchairs must meet the requirements explained below, and must be connected to the other major features of the recreation area by an ORAR.

Storage facilities designed for assistive devices must be at least 38 inches (965 millimeters) high, at least 28 inches (710 millimeters) wide, and at least 40 inches (1,015 millimeters) long. A clear floor or ground space that is 30 by 48 inches (760 by 1,220 millimeters) and positioned for a side approach must be provided in compliance with ABAAS section 305.3. The slope of this clear space can't exceed 1:33 (3 percent) in any direction, and the surface must be firm, stable, and made from a material that is appropriate to the setting and level of development. Compliance with the surface provision isn't mandatory if a condition for departure exists.

Controls and operating mechanisms must comply with the provisions for reach ranges and operability requirements specified in ABAAS sections 308 and 309 and explained in *Reach Ranges and Operability Requirements*.

Pit Toilets in General Forest Areas—Generally, pit toilets are located in remote, undeveloped areas. They are provided primarily for resource protection, rather than for visitor convenience and comfort. Pit toilets are primitive outhouses that may consist simply of a hole dug in the ground covered by a toilet riser (figure 84). The pit toilet riser may or may not be surrounded by walls and may or may not have a roof. Pit toilets may be permanent installations or they may be moved from one location to another as the hole is filled or the area has become overused. Waste disposal in pit toilets may be directly into the ground (pit) or may include moldering or composting processes.

Figure 84—A fiberglass riser for a pit toilet in the Boundary Waters Canoe Area.

Designers should not confuse pit toilets provided in general forest areas (GFAs) with toilets provided in recreation sites. Pit toilets are provided only in general forest areas and are NEVER appropriate in a recreation site with a Forest Service recreation site development level of 3 or higher.

DESIGN TIP—

It's not a pit toilet if it's not in a general forest area.

Vault toilets, flush toilets, and composting toilets are all common in recreation sites. They are not considered pit toilets and they must meet the ABAAS requirements for toilet buildings. Regardless of the waste disposal system or design of the building, toilet buildings that aren't in GFAs and that have one riser must comply with section 603 of the ABAAS requirements for toilet and bathing rooms. Toilet buildings that aren't in GFAs and that have multiple risers must comply with the requirements of section 604 of the ABAAS. Designers should be careful not to confuse the requirements for toilet stalls with those for single riser toilet rooms. Each toilet building in a recreation site also must comply with the requirements for grab bars, controls, and dispensers.

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If pit toilets are provided in GFAs, each one must meet the requirements described below. Pit toilets in GFAs don't have to be connected to ORARs.

The design of pit toilets varies widely depending on the setting, the amount of expected use, and the system used to manage the waste. If an accessible pit toilet has walls, a floor, a door, or a roof, these components must comply with the appropriate provisions of the ABAAS. If the pit toilet has a riser and toilet seat, the total height of that seat and the riser it rests on must be 17 to 19 inches (430 to 485 millimeters) above the ground or floor.

If there are sturdy walls around the pit toilet riser, standard riser dimensions, placement, and grab bars are required as shown in ABAAS sections 603, 604, and 609. Grab bar size, strength, finish, and position requirements are explained in *Grab Bars*. Grab bar location requirements for pit toilets are explained below.

Grab bars must comply with the reach ranges required in ABAAS section 308 and explained in Reach Ranges and Operability Requirements. As required in ABAAS section 604.5, grab bars for toilets must be installed in a horizontal position, 33 to 36 inches (840 to 915 millimeters) above the finished floor, measured to the top of the gripping surface.

The grab bar beside the riser must be at least 42 inches (1,065 millimeters) long, located no more than 12 inches (305 millimeters) from the wall behind the toilet, and extend at least 54 inches (1,370 millimeters) from the rear wall. The grab bar behind the riser must be at least 36 inches (915 millimeters) long and extend from the centerline of the water closet at least 12 inches (305 millimeters) on the side closest to the side wall grab bar and at least 24 inches (610 millimeters) on the other side (figure 85).

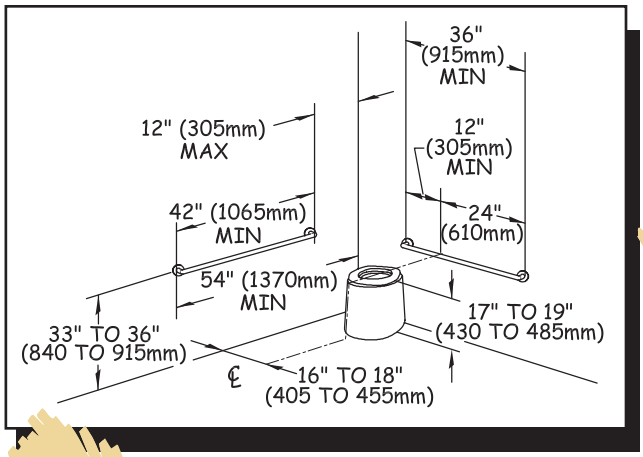

Figure 85—The requirements for grab bars in pit toilets.

For pit toilets enclosed by walls, the back of the riser must be against the wall behind the riser. A clear floor space that is at least 60 inches (1,525 millimeters) wide and 56 inches (1,420 millimeters) deep is required around the toilet. If there is a condition for departure, the space can be reduced to 56 by 48 inches (1,420 by 1,220 millimeters).

Of the required width of clear floor space, only 16 to 18 inches (405 to 455 millimeters) can be on one side of the centerline of the riser, and the rest must be on the other side. Turning space of at least 60 inches (1,525 millimeters) in diameter or "T" shaped with a minimum 60- by 36-inch (1,525- by 915-millimeter) "arm" and a minimum 36-inch- (915-millimeter-) wide by 24-inch- (610-millimeter-) long "base" is also required. Portions of the turning space may overlap the toilet clear floor space or be located directly outside the entrance (figure 86).

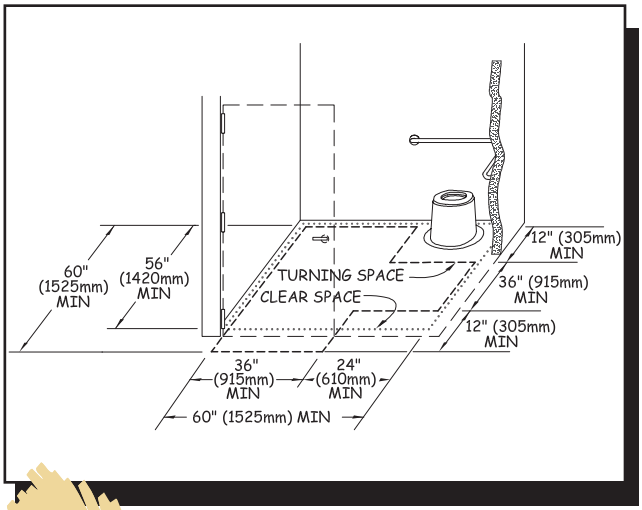

Figure 86—The requirements for a "T" turning space in a pit toilet.

If walls are provided, doorways or wall openings that provide entrance to the toilet must have a minimum clear width of 32 inches (815 millimeters), in compliance with ABAAS section 404.2.3. Door swings can't obstruct the clear floor space inside the pit toilet. Doors that open out or slide are space-efficient ways to provide the required interior clear space. Door hardware such as handles, pulls, latches, and locks must comply with the provisions for reach ranges and operability specified in ABAAS sections 308 and 309 and explained in *Reach Ranges and Operability Requirements*.

If the pit toilet has lightweight privacy screens or has no walls, the riser should have vertical or nearly vertical sides, a flat area on each side of the seat that is about 3 inches (75 millimeters) wide, and a seat cover that also functions as a back rest. For safety, grab bars must not be mounted on lightweight privacy screens that won't support 250 pounds (1,112 newtons). A clear floor or ground space that is at least 60 inches (1,525 millimeters) wide and 56 inches (1,420 millimeters) deep is required.

Of the required width of clear floor space, only 16 to 18 inches (405 to 455 millimeters) can be on one side of the centerline of the riser, and the rest must be on the other side. The depth of the clear space is measured from the back of the riser and extends in front of the riser (figure 87). If there is a condition for departure, the space can be reduced to 56 by 48 inches (1,420 by 1,220 millimeters).

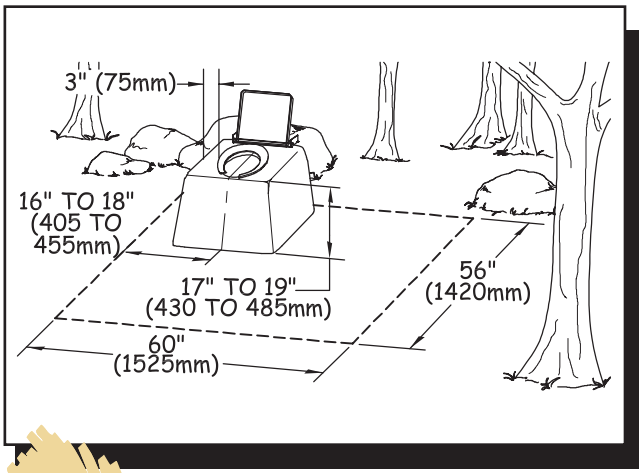

Figure 87—The requirements for clear space at an unenclosed toilet.

Whether the pit toilet has walls or not, the slope of the turning space and the clear floor or ground space generally can't exceed 1:50 (2 percent) in any direction. The slope can be up to 1:33 (3 percent) in any direction where required for proper drainage. The surface must be firm and stable and made from a material that is appropriate to the setting and level of development. Slope or surface requirements don't have to be met where a condition for departure exists.

CONSTRUCTION TIP—

Privacy screens

Lightweight privacy screens are sometimes provided for pit toilets in remote general forest areas. Screens may be provided in areas that have heavy visitor use but where walls or sturdier enclosures would significantly change the recreational setting or adversely impact significant natural features, or where it is difficult and expensive to pack in conventional construction materials. These screens may be made from tent fabric or other thin materials, and have only enough structural strength to stay upright.

Because privacy screens don't have enough strength to support a 250-pound (1,112-newton) load on grab bars, grab bars should never be attached to them. Imagine the consequences if a screen and the grab bar attached to it fell over when a person tried to use it to transfer to a toilet! Instead of attaching grab bars to screens, the screens should be positioned outside the clear area required for unenclosed toilets, so people can use the toilet without needing grab bars.

The entrance to each pit toilet should be at ground level. If this isn't feasible, because of the toilet's operation and maintenance requirements, a trail complying with Forest Service Trail Accessibility Guidelines (FSTAG) section 7.3 must be provided between the ground and toilet entrance. FSTAG section 7.0 explains the requirements for trails to "associated constructed features" such as pit toilets. If the pit toilet must be located above the ground and a trail isn't feasible because of a condition for departure, steps are permitted—but only as a last resort.

Composting and moldering toilets have a "basement" area where waste is processed. The need to service the area under the riser may make it difficult to provide a

ground-level entrance to the toilet. In other areas, surface bedrock, permafrost, or other ground conditions make it tough to dig a pit. Table 3 will help designers avoid steps at toilet entries and may trigger other creative ideas for accessible entries.

Table 3—Pit toilet entry decision aid.

Are steps needed for this pit toilet?	Is maintenance access to a waste processing area below the riser needed? Is digging a pit into the ground impractical?	→ NO	Provide ground level entrance.
	↓ YES		
	Have all options for a ground level entrance been exhausted?	→ NO	Look at the site again. Is excavation, placement of the building on a slope, or addition of fill material at the entrance feasible to allow a ground-level entrance?
	↓ YES		
	As an absolute last resort, provide steps in accordance with FSORAG section 6.6.9.		

The need for steps may be eliminated altogether if enough time is spent on site selection. For instance, a sloping site may allow the maintenance "basement" to be accessed from the downhill side, while providing a ground-level entrance to the toilet on the uphill side (figure 88).

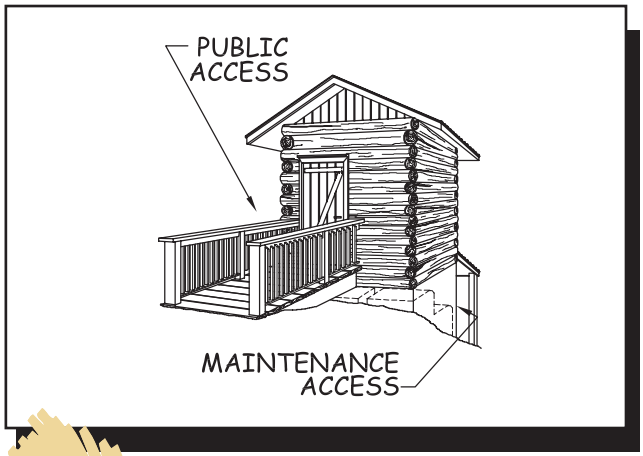

Figure 88—The two accesses to an uphill-downhill composting toilet.

DESIGN TIP—

Toilet steps should be a design solution of last resort.

If steps are used, keep in mind that a person using a wheelchair will have to get out of the wheelchair and transfer up the steps onto the pit toilet floor. Since pit toilet floors are seldom cleaned regularly, it is easy to imagine how dirty and disgusting this would be. Avoid steps if at all possible! Think about it—would you want to make that trip?

If steps can't be avoided, they must meet specific requirements that aren't the same as standard building code requirements. The treads must be at least 14 inches (355 millimeters) deep and 36 inches (915 millimeters) wide and no more than 9 inches (230 millimeters) high.

Continued

Practically speaking, the deeper the tread, the shallower the rise should be for comfortable use. With a 14-inch (355-millimeter) tread, a 6-inch (150-millimeter) riser is preferable, even though up to 9 inches (230 millimeters) is allowed. A level, clear ground space that is 30 by 48 inches (760 by 1,220 millimeters) must be provided along one unobstructed side of the steps.

One of the steps must be 17 to 19 inches (430 to 485 millimeters) above the clear ground space so that a person in a wheelchair can transfer onto it. Single steps are hazards that should be avoided; at least two steps, but preferably three, should be used. Although it's not mentioned in the FSORAG, be sure that a door swing doesn't block access from the step someone uses when transferring from a wheelchair.

Warming Huts—Permanent, fully enclosed buildings are not warming huts. Permanent buildings with walls, roof, and a door must meet all the applicable requirements of the ABAAS. Warming huts are temporary or partially enclosed spaces used intermittently for brief periods as protection from the weather. If amenities such as tables or wood stoves are provided in warming huts, they must meet the requirements of FSORAG sections 1 through 5 explained above. In addition, a turning space at least 60 inches (1,525 millimeters) in diameter (see figure 81) or "T" shaped with a minimum 60- by 36-inch (1,525- by 915-millimeter) "arm" and a minimum 36-inch- (915-millimeter-) wide by 24-inch- (610-millimeter-) long "base" (figure 82) must be provided inside the hut. This requirement is the same as ABAAS section 304.3.

Warming huts in recreation sites must be connected to other major features of the recreation area by an ORAR. If the floor of the hut is above ground level, the ORAR can either ramp up to floor level, or it can end adjacent to the tent platform 17 to 19 inches (430 to 485 millimeters) lower than the platform. This height allows someone to transfer from a wheelchair to the platform. Warming huts provided in GFAs don't have to be connected to an ORAR.

Outdoor Rinsing Showers—Even though the ABAAS sections 607, 608, and 609 cover showers, outdoor rinsing showers are specifically addressed in the FSORAG because the ABAAS description and provisions are intended for indoor facilities. Outdoor showers permit people to rinse off sand, dirt, and debris. They are not intended for bathing. They generally don't offer privacy and people usually are not permitted to disrobe.

Two types of outdoor rinsing showers are addressed: a low shower, accessible to someone in a seated position, and a high shower accessible to someone who is standing. If two or more outdoor rinsing showers are provided in a recreation site, at least one must be a low shower meeting the requirements explained below and at least one must be a high shower meeting the requirements explained below. If only one outdoor rinsing shower is provided, it must meet the requirements and be usable from both a seated and standing position. Accessible outdoor rinsing showers must be connected to the other major features of the recreation area by an ORAR. There is no exception to the ORAR because outdoor rinsing showers aren't typically found in GFAs.

For a low outdoor rinsing shower, a fixed shower head must be mounted between 48 and 54 inches (1,220 and 1,370 millimeters) above the ground or floor, the same as the ABAAS requirement for accessible indoor showers. For a high outdoor rinsing shower, a fixed shower head must be mounted at least 72 inches (1,830 millimeters) above the ground or floor. A hand-held shower spray unit complying with ABAAS section 608.6 may be used in place of a fixed shower head. Hand-held showerheads are vulnerable to vandalism and breakage, so they are

probably not a good design choice for most recreation sites. A more durable choice would be to mount low and high showerheads on one pole or wall.

Grab bars for accessible outdoor rinsing showers are not used for transfers, but are essential for stability in a wet environment. Three types of grab bars are addressed in this section: vertical, circular, and horizontal. Vertical and circular grab bars are used with showers mounted on posts. Horizontal grab bars are used with shower heads mounted on walls. Every outdoor rinsing shower must have at least one vertical, circular, or horizontal grab bar.

Grab bars for accessible outdoor rinsing showers must comply with the standard reach ranges of ABAAS section 308 that are explained in *Reach Ranges and Operability Requirements*. Grab bar size, position, mounting requirements, and structural strength are explained in *Grab Bars*. The location requirements for grab bars at outdoor rinsing showers are explained below.

If a vertical grab bar is provided at a shower head mounted on a post, the grab bar must be installed directly under the shower head. It must extend from no more than 33 inches (840 millimeters) above the floor or ground to within 3 inches (75 millimeters) of the shower head (figure 89).

If the shower head is mounted on a post, a circular grab bar may be used in place of a vertical grab bar. The grab bar must surround the usable part of the post and be installed under the shower head between 33 and 36 inches (840 and 915 millimeters) above the ground or floor (figure 90).

If a shower head is mounted on a wall, a horizontal grab bar must be provided. The grab bar must be installed under the shower head between 33 and 36 inches (840 and 915 millimeters) above the ground or floor and extend at least 18 inches (455 millimeters) in both directions from the center line of the shower head (figure 91).

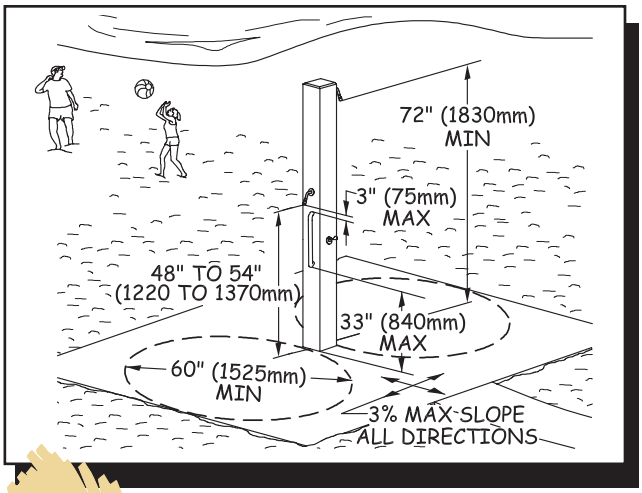

Figure 89—The requirements for a vertical grab bar.

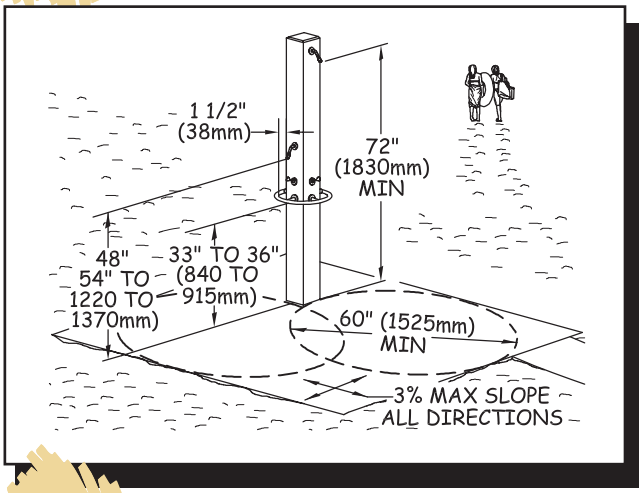

Figure 90—The requirements for a circular grab bar.

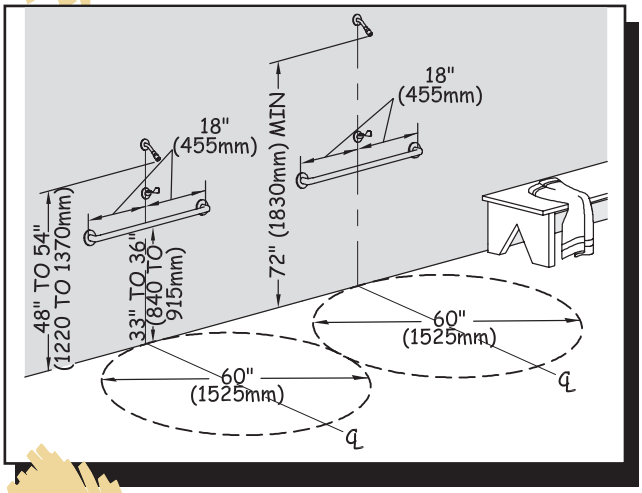

Figure 91—The requirements for horizontal grab bars.

Rinsing shower controls and operating mechanisms must comply with the provisions for reach ranges and operability specified in ABAAS sections 308 and 309 as explained in *Reach Ranges and Operability Requirements*. If self-closing controls are used, the controls must remain open for at least 10 seconds.

A clear floor or ground space at least 60 inches (1,525 millimeters) in diameter must be provided at each accessible outdoor rinsing shower. It must be located so that the water from the shower head is directed toward the center of the clear space. The slope of the clear space can't exceed 1:33 (3 percent) in any direction. The surface must be firm and stable and made from a material that is appropriate to the level of development and the setting.

Signs—Signs provide key information concerning the accessibility of programs and facilities. In accordance with ABAAS section 216, the International Symbol of Accessibility must be posted at six places:

- Accessible parking spaces in parking lots with five or more parking spaces. Do not post the International Symbol of Accessibility at parking spurs provided at camping units or other individual accessible features.
- Accessible loading zones.
- Accessible restrooms and bathing facilities.
- At the main entrance to a building, with an arrow directing people to the closest accessible entrance, if the main entrance is not accessible.
- On the door to an accessible *Area of Refuge* inside multistory buildings.
- At an accessible means of egress out of a building.

The International Symbol of Accessibility can only be posted where all constructed features and areas comply with the ABAAS. Except for the requirement to post the word *VAN* on the parking sign at van accessible spaces, no words are required to be used with the symbol. If words are used with the ISA, use *Accessible*; **do not** use *Handicapped*!

There is **NO** legal requirement on federally managed lands for International Symbol of Accessibility signs to be blue and white, even at parking spaces. If the International Symbol of Accessibility is used, it must be posted in accordance with ABAAS section 703.7, in high-contrast colors with a nonglare finish. A cream or pale yellow International Symbol of Accessibility on a brown background complies with this requirement and blends into an outdoor setting.

If you want the local law enforcement agency to be able to issue tickets for illegal parking at accessible parking spaces, the International Symbol of Accessibility must be displayed in blue and white and comply with the Manual of Uniform Traffic Control Devices (MUTCD) section 2B.39. Although their use is optional, the only approved colors for pavement markings designating accessible parking spaces are blue and white (MUTCD section 3B.18).

If a sign or kiosk has materials such as maps, brochures, fee envelopes, and so forth, the sign or kiosk must be designed to meet the standard accessible reach ranges in accordance with ABAAS section 308, as explained in *Reach Ranges and Operability Require-ments*. Clear floor or ground spaces of 30 by 48 inches (760 by 1,220 millimeters) must be provided to allow a forward or side approach.

Post the appropriate international symbols where various modes of adaptive equipment are available, such as TTY (teletypewriter), sign language interpreters, assistive listening systems, and so forth (figures 92 through 101).

If you have questions about applying any of the above information, please contact your region's recreation accessibility coordinator. Current contact information is available on the Forest Service's internal computer

network at: *http://fsweb.mtdc.wo.fs.fed.us/toolbox/acc/documents/coord.htm*.

Figure 92—Information

Figure 93—International Symbol of Accessibility

Figure 94—Teletypewriter (frequently abbreviated as TTY)

Figure 95—Telephone with volume control

Figure 96—Video or film is closed caption

Figure 97—Audio description available

Figure 98—Assistive listening system available

Figure 99—Sign language interpretation available

Figure 100—Large-print (18-point) materials available

Figure 101—Materials available in Braille

Figures 92 to 101—International symbols indicating accessibility.

Applying the Forest Service Trails Accessibility Guidelines

The first step in applying the Forest Service Trails Accessibility Guidelines (FSTAG) is to know when and where compliance is required. Section *7.0 General* and *7.1 Extent of Application* state that the FSTAG applies to National Forest System trails within the boundaries of a National Forest that meet ***all*** these criteria:

- The trail is new or altered.
- It is designed for hiker or pedestrian use.
- It connects either directly to a trailhead or to a trail that is already accessible.

The FSTAG doesn't apply to existing trails unless there is a change in the original purpose, intent, or function for which the trail was designed—an alteration, in other words. It doesn't apply to trails designed for ATV, equestrian, or any other nonpedestrian use. The FSTAG uses the term *designed for hiker/pedestrian use* in accordance with the Forest Service trail planning and management rules and National Trail Management Classes, which are also the Interagency Trail Data Standards. This information is available at: *http://www.fs.fed.us/r3/measures/TR.htm*.

The FSTAG doesn't prescribe different "levels of accessibility" based on trail class or any other grouping criteria. Following the same philosophy as the draft document on outdoor recreation developed by a regulatory negotiations committee of the Architectural and Transportation Barriers Compliance Board (Access Board), the FSTAG recognizes that a trail is either accessible or it is not. The FSTAG provides guidance for maximizing accessibility, while recognizing and protecting the unique characteristics of the natural setting, level of development, and purpose of each trail—through the use of conditions for departure from the guidelines and the related exceptions to the technical provisions, explained below.

As explained in the budget tip *Is cost an excuse?*, cost is not a valid reason for failing to make a a trail accessible. In all likelihood, the FSTAG won't apply to most portions of existing primitive, long-distance trails, although it may apply to segments that pass through developed areas. The FSTAG recognizes that there is no real benefit in making a newly constructed or altered trail in the backcountry accessible if the only way to get to it is by using an existing trail that isn't accessible and probably can't be made accessible. Application of the FSTAG will ensure that the full range of trail opportunities continues to be provided, from primitive long-distance trails to highly developed interpretive trails at popular scenic overlooks, providing hiking opportunities for everyone (figure 102).

Figure 102—Hiking is for everyone.

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Is It a Trail or an Outdoor Recreation Access Route?

An Outdoor Recreation Access Route (ORAR) is a continuous, unobstructed path designated for pedestrian use that connects pedestrian elements within a recreation site such as a picnic area, camping area, or trailhead. In contrast, a trail is defined by the 2002 Inter-agency Trail Standards as a linear route managed for human-powered, stock, or off-highway vehicle forms of transportation or for historic or heritage values. A trail is not an ORAR and is not subject to the requirements for

ORARs found in section 2.0 of the FSORAG. Accessible trails designed for pedestrian and hiker use have their own set of requirements that are described below.

Understanding Trail Terminology

Although this guidebook tries to explain requirements in ordinary language, some terms are important to understanding how the FSTAG is applied. The terms aren't organized alphabetically, but are grouped so that it's easy to understand the distinctions between similar terms.

Designed use is the intended use that controls the geometric design of a trail and determines the level to which it should be maintained. There is only one designed use per trail or trail segment. Although the trail may be actively managed for more than one use, the designed use determines the technical specifications for the trail. Often, the designed use is the managed use that requires the highest level of development. For example, pack and saddle stock require higher and wider clearances than do hikers, so a trail managed for both foot travel and horse use probably would have a designed use of "pack and saddle" rather than "hiker/pedestrian." More information about trail design parameters for the different designed uses is in *USFS Trail Design Parameters*, available at: *http://www.fs.fed.us/r3/measures/Inventory/trails%20files/National_Design_Parameters_1_31_2005.doc.*

Managed use includes the modes of travel that are actively managed and appropriate for a specific trail or area. This use reflects the management decision or intent to accommodate or encourage a specific type of trail use. Each trail or trail segment may have more than one managed use. For instance, a single trail may be managed for hiker and equestrian use in the summer and for cross-country skiing in the winter.

A **trailhead** is a site designed and developed by the Forest Service or other government agency, trail associations, trail maintaining clubs, trail partners, or other cooperators to provide a staging area for a trail. For purposes of the FSTAG, trailheads are not:

- Junctions between trails where there is no other access.
- Intersections where a trail crosses a road, or where users have developed an access point, but no improvements are provided by the Forest Service, trail associations, trail maintaining clubs, or trail partners, or other cooperators beyond minimal markers or modifications for health and safety.

Trail classes broadly organize trails by desired management characteristics and the level of development, based on forest plan direction. Trail classes take into account user preferences, the setting, protection of sensitive resources, and management activities. Trail classifications range from Trail Class 1 trails, which appear little different from animal paths and may disappear intermittently, to Trail Class 5 trails, which are usually wide, paved paths associated with highly developed environments. The FSTAG does not change Forest Service trail classes. More information about National Trail Management Classes, which are also the Interagency Trail Data Standards, is available at: *http://www.fs.fed.us/r3/measures/Inventory/trails%20files/Trail_Class_Matrix_1_31_2005.doc.*

Setting is the term used to describe the natural surroundings of a trail. On public lands outside rural and urban settings, the natural surroundings are usually the primary attraction for visitors. Improvements, such as trails, should not adversely affect the setting. For example, the design for a trail crossing a glacial boulder field must protect the geologic features. Accessibility is incorporated to the extent possible without fundamentally altering the natural environment. On the other hand, a trail designed for a wide open, relatively level area should follow the requirements of the FSTAG to the highest degree possible.

The following terms describe construction and maintenance work:

Construction is building a new trail or segment of trail where there was no trail before.

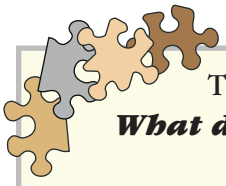
An **alteration** is a change in the original purpose, intent, or function for which the trail was designed.

Maintenance is the routine or periodic repair of existing trails or trail segments to restore them to the standards or conditions to which they were originally designed and built. Maintenance does not change the original purpose, intent, or function for which the trail was designed. Trail maintenance work isn't covered by the FSTAG. Maintenance includes:

- Removing debris and vegetation, such as fallen trees or broken branches on the trail; clearing the trail of encroaching brush or grasses; and removing rock slides.
- Maintaining trail tread, such as filling ruts, reshaping a trail bed, repairing a trail surface or washouts, installing riprap to retain cut and fill slopes, and constructing retaining walls or cribbing to support trail tread.
- Performing erosion control and drainage work, such as replacing or installing drainage dips or culverts, and realigning sections of trail to prevent erosion or to avoid boggy areas.
- Repairing or replacing deteriorated, damaged, or vandalized trail or trailhead structures or parts of structures, including sections of bridges, boardwalks, information kiosks, fencing and railings; painting; and removing graffiti.

While the FSTAG doesn't apply to maintenance, Forest Service policy is to improve accessibility wherever the opportunity arises. Resource managers are encouraged to improve accessibility on trails through trail maintenance and repair activities. Every time a trail is maintained, there is an opportunity to improve access.

The term *reconstruction* is not used in Federal accessibility guidelines or the FSTAG, even though the term is used frequently by the trails community. For the purposes of the FSTAG, actions are categorized as construction, alteration, or maintenance.



TERMINOLOGY TIP—

What do you call a reroute?

If trail work is grouped into only three categories—construction, alteration, and maintenance—what category do things like rerouting, reconstruction, and extensions of existing trails fall into? The key to answering this question is to concentrate first on the definition of *alteration*. Does the new work change the **original purpose, intent, or function** for which the trail was designed? In other words, will the trail serve a new destination? Will trail use change from, say, horses to hikers after you're done? Are you significantly changing the overall trail grade, width, or surface, or adding bridges where the trail used to ford streams or rivers? If the work doesn't fit the definition of *alteration*, it's either *construction* (if there was no trail there before) or *maintenance*.

Trail Construction Techniques

There is plenty of good information available to help you build a trail, so we won't repeat it here. The *Trail Construction and Maintenance Notebook* includes practical techniques used to construct and maintain trails. It is

written for trail crew workers and is intended to be taken along on work projects. Numerous illustrations help explain the main points. It is available at: *http://www.fs.fed.us/eng/pubs/htmlpubs/htm04232825/* and *http://www.fhwa.dot.gov/environment/fspubs/00232839/*.

The report, *Wetland Trail Design and Construction*, describes materials and techniques used to construct trails in wetlands. It is written primarily for workers who are inexperienced in wetland trail construction, but it may also be helpful for experienced workers. Techniques suitable for wilderness settings and for more developed settings are included as well as lots of drawings to illustrate important points. It is available at: *http://www.fs.fed.us/t-d/pubs/htmlpubs/htm01232833/* (Username: t-d Password: t-d) and *http://www.fhwa.dot.gov/environment/fspubs/01232833/*.

Standard Forest Service trail specifications are available at: *http://www.fs.fed.us/database/acad/dev/trails/trails.htm*.

Using the Conditions for Departure in the FSTAG

The FSTAG is based on the realities of the outdoor environment and recognizes that accessibility is not feasible everywhere because of limitations imposed by the natural terrain, existing vegetation, or other constraints. To ensure that the unique characteristics of the outdoor environment and trail recreation opportunities aren't compromised or fundamentally altered, exceptions and deviations from some technical provisions are permitted where certain circumstances, called *conditions for departure*, apply.

Section 7.1.1 of the FSTAG identifies four conditions for departure, and each is explained in more detail below. Circumstances under which exceptions can be made based on the conditions for departure differ depending on the setting. Conditions for departure permit deviations from technical provisions only where there is a general exception or an exception detailed in the technical provision sections for a particular trail component. General exceptions and technical provisions for trail components will be explained later.

Conditions for departure are not a blanket exemption from all of the technical provisions for an entire trail! If a condition for departure occurs only on part of the trail or trail component, the technical provision applies everywhere else, and all technical provisions not affected by the condition for departure also apply. For example, if there is a trail between a stream containing endangered aquatic species and a cliff with petroglyphs on it, and you can't get the required trail width without either filling part of the stream or destroying some petroglyphs, an exception allows a narrower trail past the petroglyphs. One of the conditions for departure is "where compliance would cause substantial harm to cultural...or significant natural features." How-ever, the other technical provisions still apply to that stretch of trail and the technical provision for width still applies to all the rest of the trail.

DESIGN TIP—

Why is compliance required on both sides of a departure?

Why is the trail required to comply with the accessibility provisions after terrain or an obstacle makes it necessary to depart from the guidelines? A person in a wheelchair would be blocked by the terrain or obstacle, so why make the trail accessible past that point?

Although accessible design is based on wheelchair dimensions, clear space, maneuvering room, and reach ranges, only 2 percent of people with disabili-

Continued

ties use wheelchairs. The majority of people with mobility impairments don't use a wheelchair, but rely on crutches, canes, walkers, or braces. They may be able to get around or over an obstacle without too much difficulty. Although steep terrain may be difficult, it may be manageable for a limited distance.

Likewise, a person using a wheelchair might need assistance from companions to make it up a steep grade or to get over an obstacle, but once that difficulty is past, the individual can continue on the trail independently if the rest of the trail complies with the accessibility guidelines.

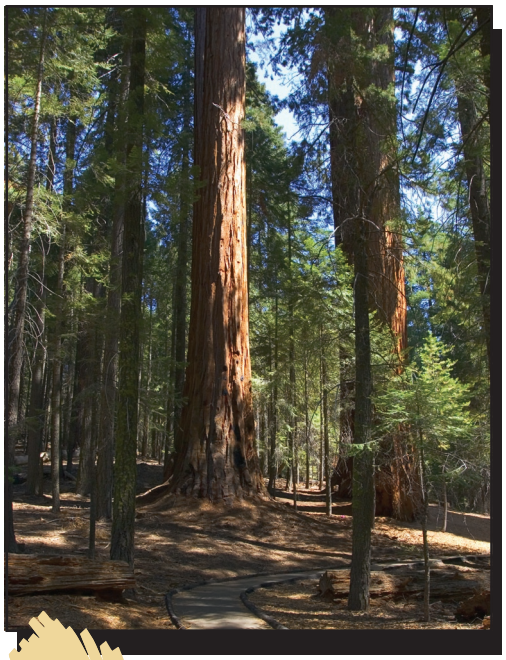


Figure 103—This giant sequoia grove is an example of a significant natural feature.

The conditions for departure cover all the important elements of a long-distance trail and the aspects that are considered when locating trail segments, but they should not be used as an excuse or loophole for failing to make trails accessible. Rather, they are to be used when all other design options have been thoroughly explored and a determination has been made that full compliance with the technical provisions would unacceptably alter the nature of the experience the visitor is seeking.

The four conditions for departure permit deviations from specific technical provisions where allowed by an exception. General examples are provided to help explain the intent of the conditions so that designers understand how to apply them according to the site-specific constraints and opportunities of their projects.

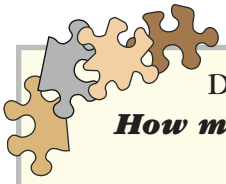
1—Where compliance would cause substantial harm to cultural, historic, religious, or significant natural features or characteristics.

A significant natural feature might be a large boulder or rocky outcrop, a unique tree or vegetation such as a giant sequoia grove (figure 103), or a body of water that is regarded as distinctive or important locally, regionally, or nationally. Significant natural features also could include areas protected under Federal or State laws, such as habitat for threatened or endangered species, designated wetlands that could be threatened or destroyed by full compliance with the technical provisions, or areas where compliance would substantially harm natural habitat or vegetation.

Significant cultural features include areas such as archeological or other heritage sites, sacred lands, burial grounds and cemeteries, and tribal protected sites. Significant historical features include properties listed or eligible for listing on the National Register of Historic Places or other places of recognized historic value. Significant religious features include tribal sacred sites and other properties held sacred by an organized religion.

If the significant feature would be directly or indirectly altered, destroyed, or otherwise harmed by construction of the trail or trail element when making it accessible, this condition for departure would apply. Consider only the additional impacts of changes needed to provide accessibility. This condition for departure doesn't apply where substantial impact will result from construction of

a trail that is not accessible and only a little more impact is due to construction directly related to accessibility.



DESIGN TIP—

How much harm is too much?

The "harm" that is to be considered by this condition for departure is only the additional impact of increasing the width, reducing the trail grade or cross slope, or other change required for accessibility. For instance, there may be concern about the number of wildflowers being removed on cut and fill slopes for an accessible sidehill trail. The plants may be an uncommon species for which the surrounding river drainage and a nearby town are named. The trail construction will destroy most of the flowers as well as the seep-dampened hanging meadow that provides their habitat. This condition for departure wouldn't apply if 323 square feet (30 square meters) must be disturbed to make way for a trail that is not accessible and only another 75 square feet (7 square meters) must be disturbed to provide an accessible trail. The majority of the proposed damage to the wildflowers is not attributable to compliance with accessibility requirements. In this case, an alternate location should be selected for the trail.

2—Where compliance would substantially change the physical or recreation setting or the trail class or designed use of the trail or trail segment or would not be consistent with the applicable forest land and resource management plan.

Public lands provide a wide variety of recreational experiences, from highly developed areas that offer almost all the conveniences of home and plenty of opportunities to relax with family and friends, to wilderness areas that appear unchanged from primeval times and provide opportunities for individuals to experience primitive and challenging conditions. The FSTAG recognizes the value of the full range of recreational opportunities by allowing exceptions where compliance with technical provisions would change the nature of the recreation opportunities or conflict with the resource management plan.

People using primitive trails, for example, experience the outdoor environment in a nearly natural state, with limited or no development. In these settings, people generally desire challenge and risk so they can use their outdoor and survival skills. Use of manufactured building materials or engineered construction techniques to comply with accessibility requirements could destroy the natural or undeveloped nature of the setting and change the visitor's experience. There is no requirement to dynamite obstacles or pave trails so they will be accessible if doing so would unacceptably change the character of the setting and the recreation opportunity.

Consider a trail intended to provide a rugged experience, such as a cross-country training trail with a steep grade or a fitness challenge course with abrupt and severe changes in elevation. If these trails were flattened out or otherwise constructed to comply with the technical provisions for accessible trails, they wouldn't provide the desired challenge for users. Trails that traverse boulders and rock outcroppings are another example. The purpose of these trails is to provide users with the opportunity to climb the rocks. To remove the obstacles along the way or reroute the trail around the rocks would destroy the purpose of the trail. The nature of the setting also may be compromised by actions such as widening a trail for an imported surface or removing ground vegetation from fragile or erosive soils.

3—Where compliance would require construction methods or materials that are prohibited by Federal, State, or local law, other than State or local law whose sole purpose is to prohibit use by persons with disabilities.

This condition for departure is best illustrated by example. For instance, federally designated wilderness areas prohibit use of mechanized equipment. If accessibility requirements can't be met with handtools, this condition for departure will apply in wilderness areas.

This condition for departure also may apply in areas:

- Where imported materials, such as soil stabilizers, are prohibited to maintain the integrity of the natural ecosystem or historic resources
- Such as designated wetlands or coastal areas where construction methods and materials are strictly limited
- Where Federal statutes such as the Wilderness Act, Endangered Species Act, or State and local law impose restrictions to address environmental concerns
- Where water crossings are restricted to safeguard aquatic features that are protected under Federal or State laws.

Local law has been included in this condition for departure to address situations where conservation easements or development programs have prohibited or restricted construction methods and practices.

On the other hand, under the Americans with Disabilities Act, State and local governments can't enact laws whose sole purpose is to prohibit use by people with disabilities. Therefore, that sort of law can't serve as a basis for deviation from the technical provisions in the FSTAG. For example, a local regulation that arbitrarily limits trail width to a dimension that wouldn't allow wheelchairs or other assistive devices to access a trail is not a justification for deviation from FSTAG requirements under this condition for departure.

4—Where compliance would be impractical due to terrain or prevailing construction practices.

The phrase "would be impractical" in this condition for departure refers to something that is not reasonable, rather than to something that is technically infeasible. This condition for departure applies when the effort and resources required to comply would be disproportionately high relative to the level of access created.

Trail construction practices vary greatly, from reliance on volunteer labor with handtools to professional construction using heavy, mechanized equipment. For alterations of existing trails, *prevailing construction practices* means the methods typically used for work on the trail. For new trails, the land manager determines the construction practices to be used on each trail. However, the choice of construction practice is determined primarily by available resources, such as machinery and skilled operators, and environmental conditions, such as soil type and depth, vegetation, and slope.

The intent of this condition for departure is to ensure that compliance with the technical provisions of the FSTAG does not require the use of construction practices that are beyond the skills and resources of the organization building the trail. This condition for departure is not intended to exempt the trail from the technical provisions of the FSTAG simply because a trail builder's favored construction practice includes the use of a large mechanical roller rather than a smaller vibrating plate or "wacker" type compactor. A contractor's or designer's preference for the larger equipment is not a "feasibility" issue.

This condition also may apply where construction methods for particularly difficult terrain or an obstacle require the use of equipment or methods other than that typically used throughout the length of the trail. In an area where small equipment or handtools are normally used to minimize impact on a sensitive adjacent stream, blasting might be required to remove a rock outcropping. Because blasting is outside the range of typical equipment and methods used, this condition for departure would apply.

DESIGN TIP—
What's "feasible?"

Using heavy construction equipment, it may be possible to provide a trail with a maximum 1:20 (5 percent) grade up a 1,500-foot (460-meter) mountain (figure 104). However, the trail would be about three times as long as under a traditional backcountry layout (figure 105), which could cause inappropriate environmental and visual impacts and more than triple the amount of ground disturbed. It wouldn't be feasible to construct an accessible trail in this situation.

Figure 104—A 5-percent grade trail on a steep hill.

Figure 105—A traditional trail grade on a steep hill.

Using the General Exceptions in the FSTAG

Some public lands are reasonably well suited for hiking or pedestrian travel. Other public lands are rocky, soggy, excessively steep, or otherwise ill suited for foot traffic. Two general exceptions are provided in FSTAG section 7.1.2 to ensure that accessibility is provided where it will have the most benefit, be feasible, and provide a meaningful hiking opportunity. These general exceptions provide exemptions from the technical provisions for trails when environmental barriers are so severe or so numerous that a trail through an area can't be modified to meet the intent and objectives of an accessible hiking opportunity.

Where the general exceptions apply, the trail does not have to be accessible, except in two situations:

- A trail must always be accessible from either end to the first uncorrectable environmental barrier if the distance from the end of the trail to the barrier is more than 500 feet (152 meters) (figure 106).

Figure 106—This trail section is over 500 feet (152 meters) long and must be accessible.

- A trail that goes past a prominent feature must always be accessible at least to the feature—no matter how far from the end of the trail—unless there's an uncorrectable environmental barrier between the end of the trail and the prominent feature (figure 107).

Figure 107—There are no uncorrectable barriers between the end of this trail and the waterfall, so this section of the trail must be accessible.

Even if visitors can't use the entire trail, they should be able to enjoy a short hike—especially if it includes a prominent feature (figure 108).

Figure 108—All hikers can enjoy this beautiful alpine lake.

A prominent feature is a natural, cultural, or historic feature along or adjacent to a trail that has national, regional, or local distinction or significance. It might be the focal point, main attraction, or destination of the trail or it may simply be an interesting secondary feature, such as a boulder outcrop, waterfall, grouping of old or unique trees, cultural or historic structure, a wildflower meadow, an area popular for wildlife viewing, or a vista.

General Exception 1 addresses extreme environmental barriers (figure 109) that are effectively impassable and render the trail beyond unreachable for many people

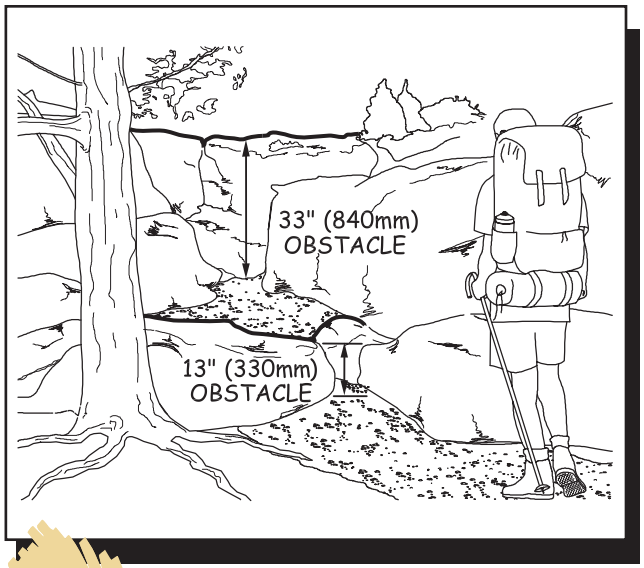


Figure 109—The 33-inch (840-millimeter) rock face is an example of an extreme environmental barrier.

with mobility limitations. It only applies when there are one or more conditions for departure **AND** at least one of the following limiting factors:

- The combination of trail grade and cross slope exceed 20 percent for more than 40 feet (12 meters).

- The surface is not firm and stable for 45 feet (13.7 meters) or more.

- The clear tread width is 18 inches (455 millimeters) or less for at least 20 feet (6 meters).

- A trail obstacle at least 30 inches (760 millimeters) high extends across the full width of the trail.

Remember that sections at the ends of a trail must always be accessible if they lead to prominent features or are more than 500 feet (152 meters) long before the first uncorrectable environmental barrier.

General Exception 2 addresses trails with numerous environmental barriers that can't be eliminated, meaning that the trail would have no possibility of meeting the intent or objectives of an accessible hiking opportunity. Where one or more conditions for departure result in deviations from the technical provisions for more than 15 percent of the length of the trail, the trail is exempt from accessibility requirements. The percentage of trail affected by deviations is calculated by adding up the length of trail impacted by each deviation and dividing that distance by the total length of trail.

Consider the design for a new 1-mile- (1,600-meter-) long trail. Fifteen percent of 1 mile (1,600 meters) is 792 feet (240 meters). If all the lengths of trail where slope, width, or other requirements can't be met because of conditions for departure add up to more than 792 feet (240 meters) of trail, the technical provisions of FSTAG section 7.3 won't apply to most or all of the trail.

Remember that sections at the ends of a trail must always be accessible if they lead to prominent features or are more than 500 feet (152 meters) long before the first uncorrectable environmental barrier.

Some long-distance trails, such as the Continental Divide, Pacific Crest, Appalachian, or Florida National Scenic Trails, or the Nee-Me-Poo National Historic Trail, span many districts or forests. For these trails, only the length of trail planned for construction or alteration within the current planning period is considered when figuring the 15 percent, not the entire length of the trail. This principle applies even if the planning period is several years long. Lengths of trail that are not connected but are covered by the same planning process should be considered separately, unless there is a special circumstance where several trails function together to access one attraction or serve one purpose. Connected sections of trail that will be constructed or altered over several years should be considered together.

Documenting Decisions

If a determination is made that the FSTAG either doesn't apply to a trail or can't be met on some sections of the trail, section 7.1.3 of the FSTAG requires the determination to be documented and saved in the project file. The documentation doesn't have to be anything elaborate, and there's no required format. A single page stating how and why the determination was made, which conditions for departure and exceptions apply to what trail sections, the date, and the names of the people who made the decision is sufficient to show that the FSTAG was used at the onset of the project and that a good-faith effort was applied to the consideration of accessibility. A decision not to make a trail accessible is an important decision that will affect both current and future trail users and managers. The documentation is required to ensure that the decision can still be understood if the people involved are no longer available.

Technical Provisions—How To Make a Hiker/Pedestrian Trail Accessible

Section 7.3 of the FSTAG explains the requirements for accessible trails, including trail **grade** and **cross slope, resting intervals, surfacing, clear tread width, passing spaces, tread obstacles, protruding objects, openings, edge protection,** and **signs.** All of these requirements are minimums. In the spirit and intent of universal design, designers are encouraged to meet the highest provisions wherever it is feasible, given the specific natural constraints of the environment, the level of development, and other managerial considerations. Trail puncheons and trail bridges are included in the Forest Service definition of trail constructed features, so they must be constructed to meet the same requirements. In the following sections, the term *trail* includes trail puncheons and trail bridges.

The building blocks for accessible design are mostly based on wheelchair dimensions, clear space, maneuvering room, and reach ranges found in the ABAAS. This is because the dimensions, multiple moving surface contact points and wheels of a wheelchair are usually the most difficult to accommodate. If a person who uses a wheelchair can use a trail, most other people can, too.

Technical provisions for trails are explained below. An Overview of the FSTAG Implementation Process and an Overview Chart of the FSTAG Implementation Process follow the technical provisions.

Grade and Cross Slope for Trails

Trail grades and cross slopes must meet the requirements explained below. Recognizing that steeper terrain makes it difficult to achieve flat grades everywhere, and that people are able to handle steeper slopes for short distances, several options are provided to afford accessibility while fitting the trail to varying terrain. An exception to the trail grade and cross slope requirements is allowed if a condition for departure exists.

Trails are to be designed with a running slope of up to:

- 1:20 (5 percent) for any distance
- 1:12 (8.33 percent) for up to 200 feet (61 meters)
- 1:10 (10 percent) for up to 30 feet (9 meters)
- 1:8 (12.5 percent) for up to 10 feet (3 meters)
- 1:7 (14 percent) into and out of drain dips for up to 5 feet (1.5 meters) where the cross slope does not exceed 1:10 (10 percent, figure 110).

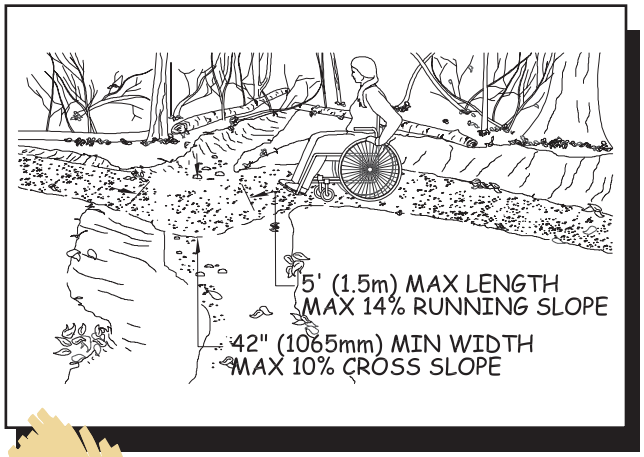


Figure 110—The requirements for accessible slopes at a drain dip.

CONSTRUCTION TIP—

What is a slope ratio?

Slopes are often described as a ratio of vertical distance to horizontal distance, or *rise* to *run* (figure 111). For instance, a slope of 1:20 means that for every foot of vertical rise, there are 20 feet of horizontal distance (or for every meter of vertical rise, there are 20 meters of horizontal distance).

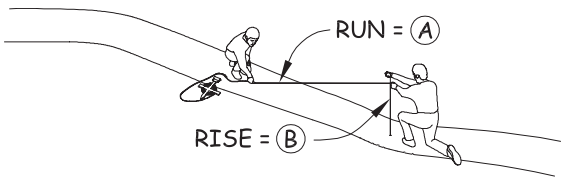


Figure 111—Determining the slope ratio.

To ensure that the trail is not designed as a series of steep segments, no more than 30 percent of the total length of the trail may exceed a grade of 1:12 (8.33 percent).

Cross slopes—the side-to-side slope of a trail tread (figure 112)—can be difficult to traverse, but provide drainage to keep water from ponding and damaging the trail, especially on unpaved surfaces. Trails with too little cross slope tend to become streams. Water running down or ponding on them destroys the trail.

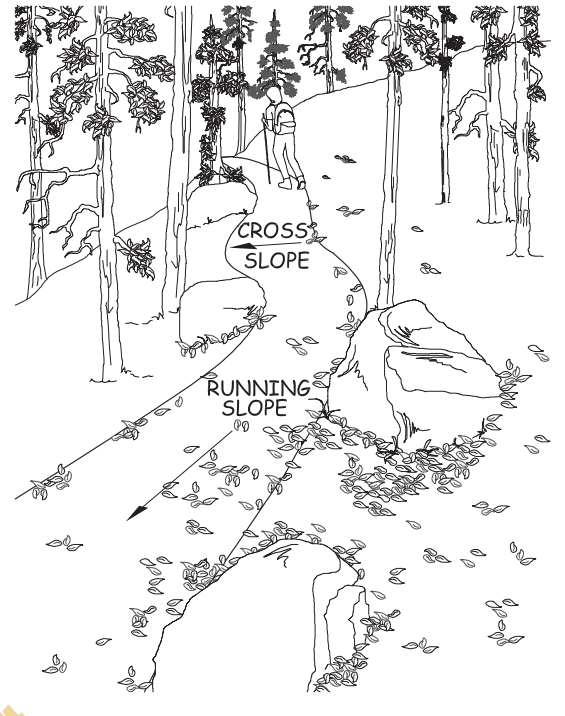


Figure 112—The running slope is measured along a trail's length; the cross slope is measured along its width.

Cross slopes can't exceed 1:20 (5 percent). If a trail has at least 42 inches (1,065 millimeters) clear width at a drain dip, a cross slope of up to 1:10 (10 percent) is permitted at the bottom of the drain dip. The 42-inch (1,065-millimeter) width allows a person who uses a wheelchair to maneuver across the drain dip at an angle, minimizing the chances of tipping over (figure 110). The possibility that a wheelchair might tip over is also why the increased trail grade at a drain dip is only allowed where the cross slope is no steeper than 1:10.

Resting Intervals on Trails

Resting intervals, relatively level areas that provide an opportunity for people to stop and catch their breath, are required any time the running slope exceeds 1:12 (8.33 percent). An exception allows a resting interval to be skipped if one can't be provided because of a condition for departure.

A resting interval is at least 60 inches (1,525 millimeters) long and at least as wide as the trail leading into it (figure 113). Depending on the design and location, the intersection of two trails may act as a resting interval (figure 114). In most cases, the slopes of a resting interval cannot exceed 1:20 (5 percent) in any direction. Where the trail grade falls between 1:20 (5 percent) and 1:12 (8.33 percent), resting intervals must be provided at least every 200 feet (61 meters). For slopes from 1:12 (8.33 percent) to 1:10 (10 percent), resting intervals must be provided at least every 30 feet (9 meters). Trail grades from 1:10 (10 percent) to 1:8 (12 percent) require resting intervals every 10 feet (3 meters).

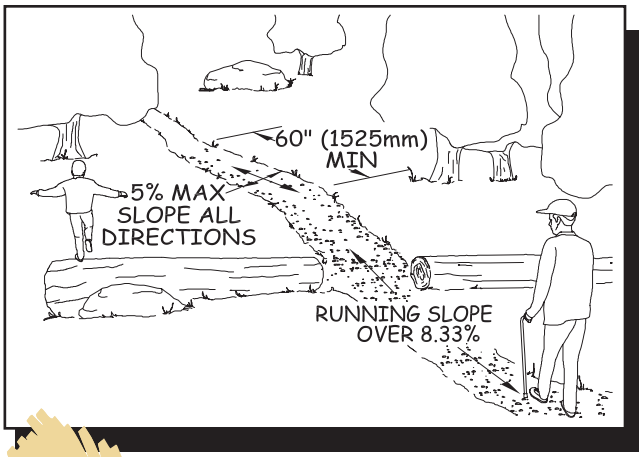


Figure 113—The requirements for resting intervals.

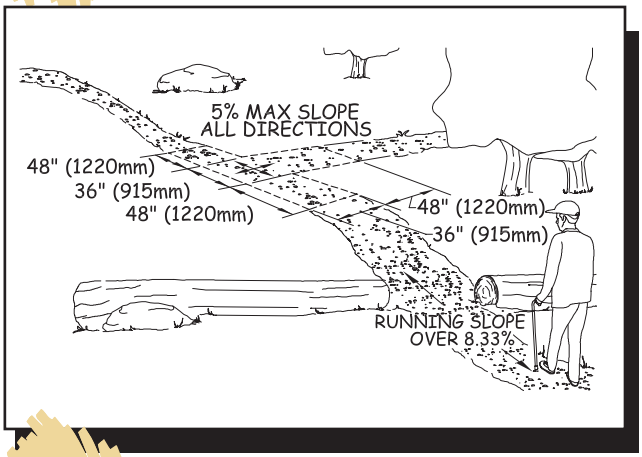


Figure 114—The requirements for a resting interval at a "T" intersection.

Surfaces of Trails

Trail surfaces must be firm and stable. An exception to this requirement is allowed if a condition for departure exists.

Paving with concrete or asphalt is appropriate for highly developed areas. For less developed settings, crushed gravel, fine crusher rejects, packed soil, and other natural materials may provide a firm and stable surface. Natural materials also can be combined with synthetic bonding materials that provide stability and firmness. These materials may not be suitable for every trail, which is why the exception is permitted.

Slip resistance is not required for trails because tree and shrub leaves and needles, dirt, ice, snow, and other surface debris and weather conditions are part of the natural environment that would be difficult, if not impossible, to avoid.

The FSTAG defines a firm surface as a trail surface that is not noticeably distorted or compressed by the passage of a device that simulates a person who uses a wheelchair, as explained in the design tip *What is firm and stable?* Natural soils should be evaluated during the planning process for their ability to be compacted to a firm and stable surface under normally occurring weather conditions during the primary seasons of use. The FSTAG defines a stable surface as a trail surface that is not permanently affected by normally occurring weather conditions and that is able to sustain wear and tear produced by normal use between planned maintenance cycles. The determination of firmness and stability needs to be made keeping in mind the typical conditions that occur in the vicinity of the trail being evaluated. Local trail managers know the surface and how it wears throughout the primary seasons for which the trail is managed.

Clear Tread Width of Trails

Clear tread width means the width of the traveled surface on the ground and also above the ground between obstacles (figure 115). The clear tread of an accessible trail must be at least 36 inches (915 millimeters) wide. An exception permits the width to be reduced to 32 inches (815 millimeters) minimum if a condition for departure exists. A second exception allows an exemption from the clear tread provision if a condition for departure exists and the 32-inch (815-millimeter) width can't be achieved.

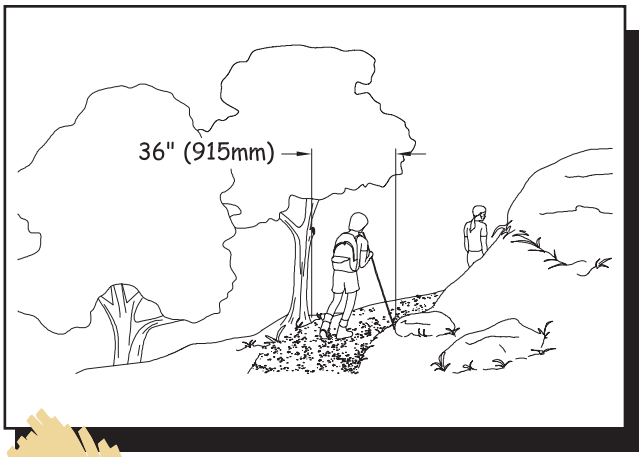


Figure 115—The requirements for clear tread width on a trail.

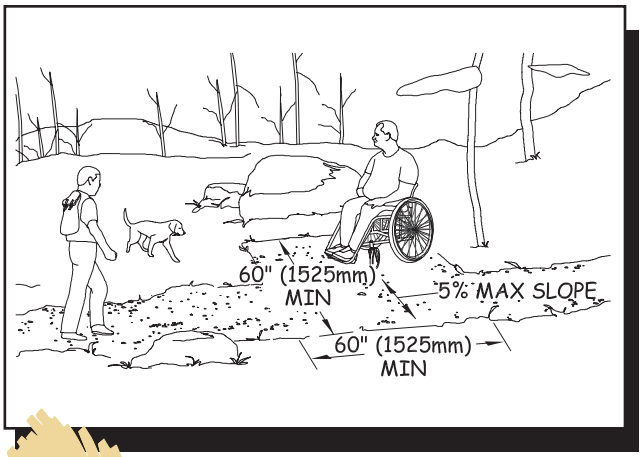


Figure 116—The requirements for passing spaces.

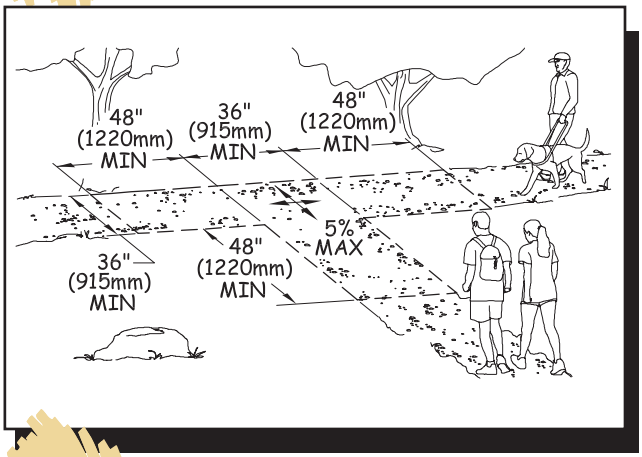


Figure 117—The requirements for passing spaces at "T" intersections.

Passing Spaces on Trails

A 60-inch (1,525-millimeter) clear tread width is required for two wheelchairs to pass comfortably and safely on a trail. However, this width is not always appropriate in all settings and for all trail classes. Where the clear tread width of a trail is less than 60 inches (815 millimeters), passing spaces are required at least every 1,000 feet (305 meters). An exemption is allowed if a passing space can't be provided because of a condition for departure.

Passing spaces must be at least 60 inches (1,525 millimeters) wide (including the trail width) by 60 inches (1,525 millimeters) long (figure 116). A "T" intersection of two trails or other walking surfaces also can be used as a passing space, provided that the arms and stem of the T-shaped space extend at least 48 inches (1,220 millimeters) beyond the intersection (figure 117). Either configuration would provide enough room for someone to move to the side and let an oncoming person pass along the trail. The cross slope of a passing space should not exceed 1:20 (5 percent).

Tread Obstacles on Trails

A tread obstacle is anything that interrupts the evenness of the tread surface. On trails, tread obstacles often occur as a result of ruts, roots, and rocks in the tread surface. Tread obstacles generally can't be more than 2 inches (50 millimeters) high. Tread obstacles can be up to 3 inches (75 millimeters) high if the trail grade and cross slope are both 1:20 (5 percent) or less. These requirements minimize the chance that someone who uses a wheelchair might tip over when crossing a tread

obstacle. An exemption from the obstacle height requirements is allowed if compliance isn't possible because of a condition for departure.

Protruding Objects and Trails

Protruding objects extend into the clear width area of a trail from beside or above the trail. Leaning tree trunks, rock ledges, and branches are common protruding objects. There must be at least 80 inches (2,030 millimeters) of clear headroom above trails, the same requirement as ABAAS section 307. If the vertical clearance of a trail is reduced to less than 80 inches (2,030 millimeters) because of a condition for departure, a barrier must be provided to warn people who are blind or visually impaired (figure 118). An exemption to the requirement

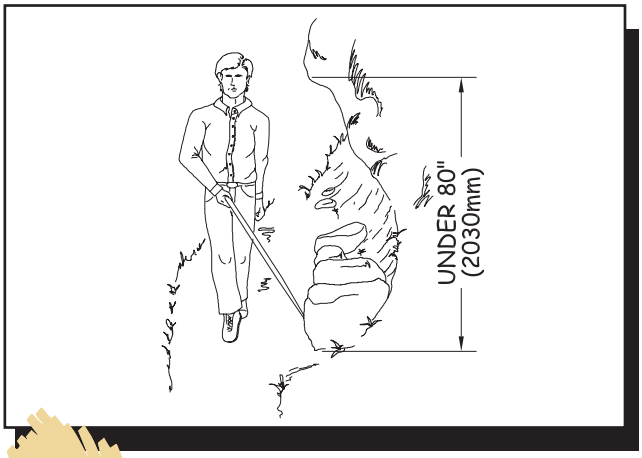


Figure 118—A warning barrier is required wherever vertical clearance is insufficient.

is allowed where a condition for departure prevents installing a barrier or providing 80 inches (2,030 millimeters) of clearance. This exception allows a trail to pass under ledges or through caves without changing the character of undeveloped areas (figure 119).

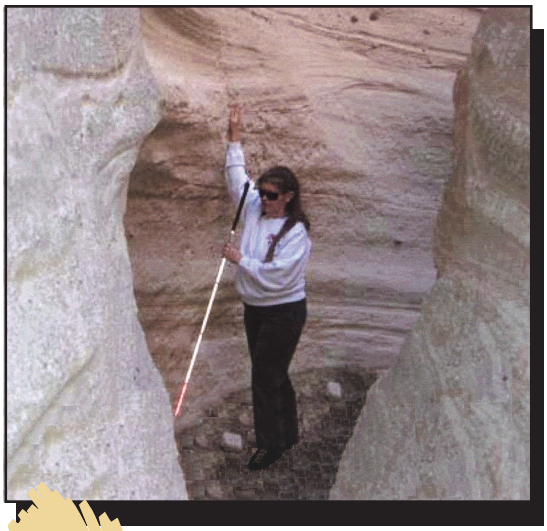


Figure 119—Entering a cave in an undeveloped area managed by the Bureau of Land Management.

Openings in Trail Surfaces

Openings are gaps in the surface of a trail. Gaps include slots in a drainage grate and spaces between the planks on a puncheon, bridge, or boardwalk. Openings that are big enough for wheels, cane or crutch tips, or shoe heels to drop through or get stuck in are hazards that should not exist in pedestrian routes. Openings up to ½ inch (13 millimeters) wide are permitted in trail surfaces. Elongated openings must be placed so that the long dimension is perpendicular or diagonal to the primary direction of travel (figure 120). Elongated openings

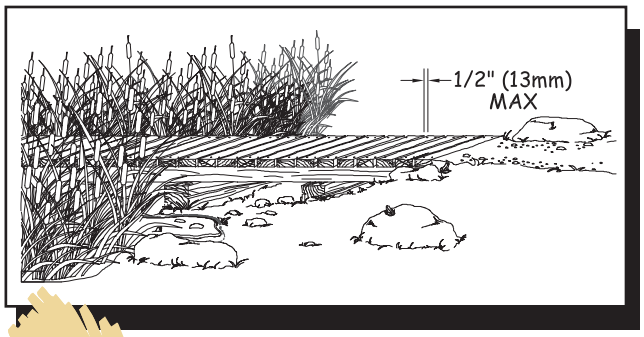


Figure 120—The requirements for openings in the trail surface that are perpendicular to the direction of travel.

less than ¼-inch (6.4 millimeters) wide may be used parallel to the dominant direction of travel (figure 121). This allows trail managers to place boards lengthwise along a boardwalk trail, as is often done in wetland areas.

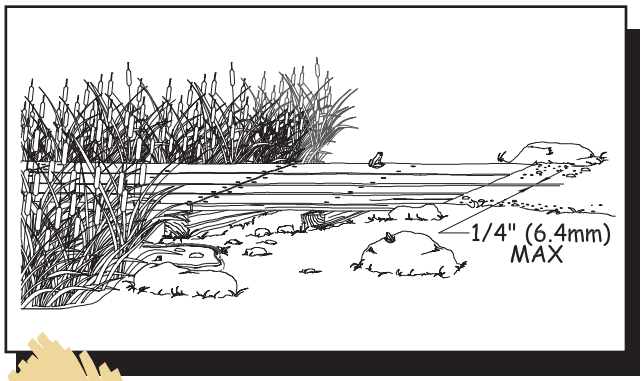


Figure 121—The requirements for openings in the trail surface that are parallel to the directdion of travel.

If there is a condition for departure, openings less than ¾ inch (19 millimeters) wide may be placed perpendicular or diagonal to the predominant direction of travel. This exception allows the use of boardwalk decking that needs more than ½-inch- (13-millimeter-) wide spacing between the planks to permit expansion and to allow water to drain.

If one or more conditions for departure prevent the trail from meeting the requirements above, compliance with the openings provision isn't required.

Edge Protection for Trails

Edge protection is a raised curb, wall, railing, or other projecting surface that defines the edge of a travel surface and helps keep people and assistive devices from accidentally falling off the edge. Edge protection is not required for accessibility on trails. However, if edge protection is provided on a trail to improve safety or for other reasons, it should be designed appropriately for the site and must be at least 3 inches (75 millimeters) high. This is higher than the 2-inch (50-millimeter) edge protection required by the ABAAS because objects less than 3 inches (75 millimeters) high aren't easy to see or detect in the outdoors. Such objects may become a tripping hazard, particularly since natural trail surfaces tend to be irregular. In the outdoors, people with limited vision who use canes tend to search higher than they do indoors (figure 122). They use the tactile change between the trail surface and the surrounding ground surface to distinguish between the edge and the surface of the trail. Holes, slots or other openings in the edge protection may be provided for drainage or other reasons.

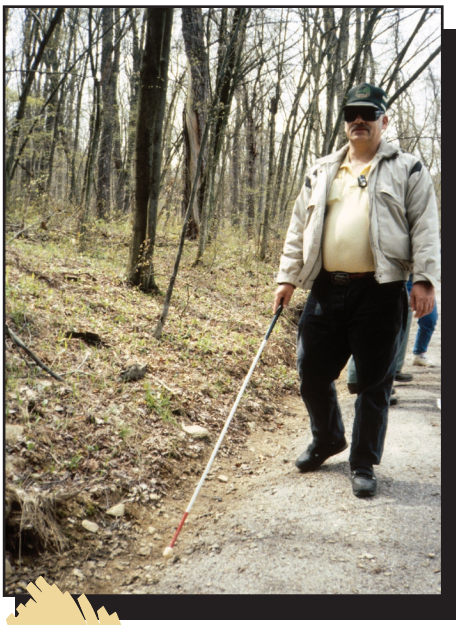
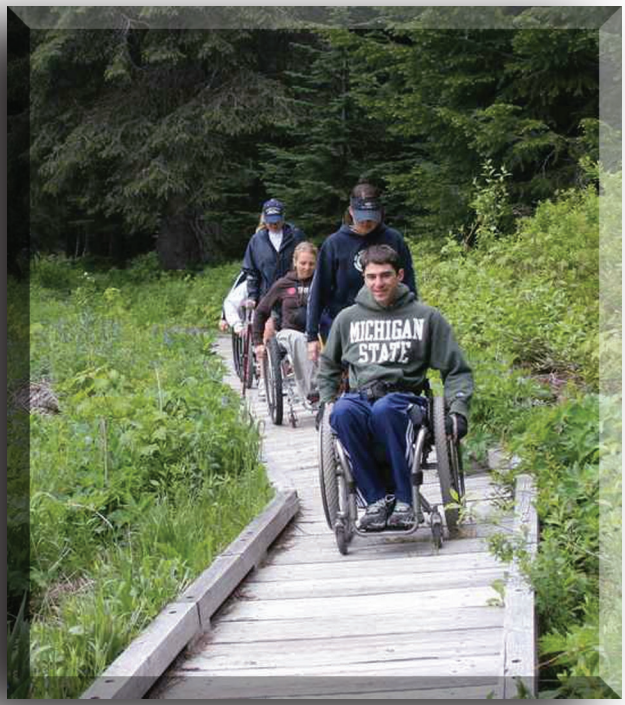


Figure 122—A hiker searches the edge of a trail.

Signs for Trails

Local managers can decide whether to post signs on newly constructed or altered class 1, 2, or 3 hiking or pedestrian trails. If a local manager decides to post signs, they must meet the requirements explained below. Trail classes are explained in *Understanding Trail Terminology*.

Signs must be posted at the trailheads of newly constructed or altered class 4 or 5 trails and trail segments that are designed for hiker or pedestrian use, and at trailheads for trails that have been evaluated for accessibility. At a minimum, information on trailhead signs must include:



- Trail name
- Trail length
- Typical and maximum trail grade
- Typical and minimum tread width
- Typical and maximum cross slope
- Trail surface (type and firmness of surface)
- Any major height obstacle, such as boulders, in the trail tread
- A statement that posted information reflects the condition of the trail when it was constructed or assessed, including the construction or assessment date

The last requirement is because tree blowdowns, flooding, or other events can make trails designed and constructed to FSTAG standards temporarily inaccessible until maintenance crews can clear the obstruction.

Where more extensive trail information such as an aerial map of the trail and related facilities is provided, the location of specific trail features and obstacles that do not comply with the FSTAG's technical provisions should be identified and a profile of the trail grade should be included.

If materials such as maps, brochures, fee envelopes, and so on need to be obtained from or filled out at a sign or kiosk, the sign or kiosk must be designed to meet the standard reach ranges of a person in a wheelchair in accordance with ABAAS section 308 as explained in *Reach Ranges and Operability Requirements*. In addition, 30- by 48-inch (760- by 1,220-millimeter) clear floor or ground spaces must be provided to allow for forward or side approach.

Constructed Features Associated With Trails

In the FSTAG, the term *associated constructed features* refers to tent pads and platforms, pit toilets, viewing areas, benches, warming huts, and similar structures for trail users. To comply with the Architectural Barriers Act of 1968 and Section 504 of the Rehabilitation Act of 1973 (Section 504), associated constructed features provided along trails—even trails that are not accessible—must be designed to comply with the applicable provisions in the FSORAG.

The path of travel between associated constructed features, as well as the path connecting them to a trail, must comply with the FSTAG. These paths are not ORARs and are not required to meet the technical provisions for an ORAR.

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DESIGN TIP—

If the trail isn't accessible, why does the warming hut have to be accessible?

This issue was clarified for Federal agencies when a complaint was filed with the U.S. Access Board against the National Park Service for installing an inaccessible toilet at 10,000 feet (3,048 meters) on Mt. Rainer. The petitioner was a paraplegic who was climbing the mountain with a sit-ski and ropes. He was not able to use the toilet that the rest of his party could use, because it wasn't accessible. The Access Board found that the Park Service was not in compliance with the 1968 Architectural Barriers Act that requires all new construction funded by Federal Executive agencies to be accessible. The Park Service settled the case by replacing the toilet with an accessible model.

The Forest Service was cited by the Access Board after a complaint was filed about a toilet serving the trail at North Doublehead in New Hampshire. The toilet was constructed in 1972, after the 1968 passage of the ABA. The Forest Service replaced the toilet with an accessible model.

Continued

It's really in the best interests of all organizations to ensure that all facilities—regardless of where they are located—are appropriate to the setting and are accessible. When accessibility is integrated into the design from the beginning, there's not much difference in cost. If the design of a facility that's already under construction must be changed to provide for accessibility, or if an inaccessible facility has to be replaced with an accessible facility at a later date, costs will be substantial.

Associated constructed features must be designed appropriately for the setting and in compliance with the applicable provisions in the FSORAG to ensure that the facility can be used for its primary purpose by all hikers, including hikers with disabilities. For example, a trail hut or lean-to with three walls may be provided along a trail. If its floor is above the ground, at least one section of the floor on the open side of the hut must be 17 to 19 inches (430 to 485 millimeters) above the ground to facilitate transfer onto the floor from a wheelchair, as explained in *Warming Huts*.

Requirements for all recreation facilities, including those that are commonly associated with trails, are contained in the FSORAG and explained in the section titled Applying the Forest Service Outdoor Recreation Accessibility Guidelines. The requirements for tent pads are explained in *Camp Unit Tent Pads and Tent Platforms*. The requirements for pit toilets are explained in *Pit Toilets in General Forest Areas*. Constructed features associated with trails must meet the requirements for those features provided in GFAs.

Overview of the FSTAG Implementation Process

Now that you have learned about the extent of application, general exceptions, and the technical provisions, you may be wondering how the whole process ties together. A process overview chart that graphically summarizes the FSTAG steps and sequencing is included below. It guides the trail designer through a series of questions to determine if the FSTAG would apply to the trail being designed. Following this process also enables trail designers to verify that opportunities to provide the highest level of accessibility have been evaluated and that the character, trail class, and experience of the setting have not been changed. You may want to look at a copy of the chart while reading the following explanation of its use.

Step 1—Determine the applicability of the FSTAG
Once a decision has been made to design or alter a trail, three questions must be asked:

1—Is the designed use "hiker/pedestrian"?
If yes,
2—Does the work meet the definitions for new construction or alteration that are explained in *Understanding Trail Terminology*?
If yes,
3—Does the proposed trail connect to a trailhead or accessible trail? *Trailhead* is defined in *Understanding Trail Terminology*.

If the answer to any of those questions is *no*, the FSTAG does not apply and no further analysis is required. The finding and reasons that the FSTAG does not apply should be briefly documented and put in the project file. Even so, it is always desirable to incorporate accessibility where opportunities exist.

If the answer to all three questions is *yes*, the designer moves to step 2.

DESIGN TIP—
No substitute for on-the-ground layout

In order to work through steps 2, 3 and 4 of the overview process, trail designers should have a proposed trail alignment identified on the ground. The review and analysis required in these steps must be based on actual field conditions, rather than relying only on topographic maps.

Step 2—Identify the presence of limiting factors
This step addresses General Exception 1 and the four limiting factors that are explained in *Using the General Exceptions in the FSTAG*. The sequence for identifying the limiting factors may vary and does not need to be done in the order illustrated in the process overview chart.

Let's work our way through the process overview chart by asking four questions, each related to one of the limiting factors. The first question will be explained in detail to serve as an example for the other three.

"Does the combined trail grade and cross slope exceed 20 percent for a continuous distance of 40 feet (12 meters) or more?"

If not, the FSTAG may still apply, so you should consider the next limiting factor. A *continuous distance* means a sustained grade without rest areas or more moderate grades or grade breaks. If the alignment can be relocated to get a more moderate grade, this limiting factor doesn't apply.

CONSTRUCTION TIP—

Measuring grade

Grade can be measured in a number of ways. An informal survey can be done between obvious trail grade breaks with a hand level, survey rod, and measuring chain (figure 123). A digital level can also be used (figure 124). A detailed universal trail assessment process that uses a clinometer and digital inclinometer to measure grade and cross slope has been developed by Beneficial Designs. More information about this process and the instruments needed to perform the assessment are available at: *http://www.beneficialdesigns.com/trails/utap.html#overview%20background*.

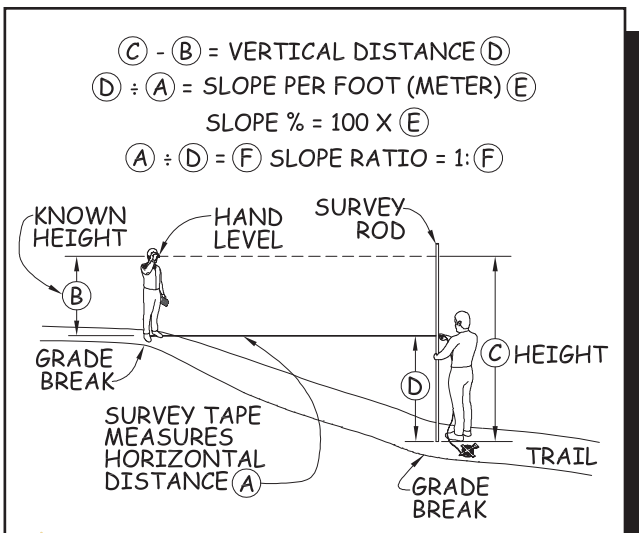


Figure 123—Surveying trail grade with a hand level.

If the grade and cross slope are exceeded, you would need to determine whether a condition for departure exists that permits a deviation from the required grade. If there is no condition for departure, the FSTAG may still apply, so you should proceed to the next limiting factor.

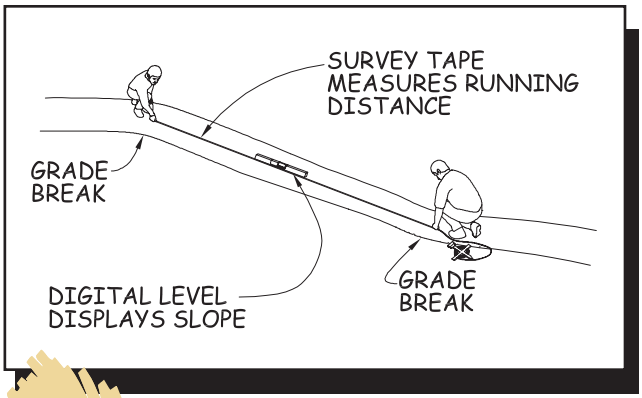


Figure 124—Surveying trail grade with a digital level.

If a condition for departure does exist, document the length of trail that exceeds those grades, the location of the area, and your data source (field survey, clinometer, etc.). The FSTAG requirements don't apply beyond the section with excessive grade.

Next, determine whether the extreme grade and cross slope are more than 500 feet (152 meters) from either end of the trail. If so, FSTAG requirements apply between the end of the trail and this limiting factor. If not, determine whether there is a prominent feature between the end of the trail and this limiting factor. If there is a prominent feature, FSTAG requirements apply from the end of the trail to the prominent feature. If there is no prominent feature, the FSTAG does not apply to this trail at all and no further review or analysis is required. This determination and the applicable condition for departure should be documented for the project file.

Work your way through the other three limiting factors the same way.

"Is the surface unfirm or unstable for 45 feet (14 meters) or more?"

DESIGN TIP—

What is firm and stable?

In the late 1990s, the Access Board funded an Accessible Exterior Surfaces research project conducted by Beneficial Designs of Minden, NV. Results of the study are available on the Access Board's Web site at: *http://www.access-board.gov/research/Exterior%20Surfaces/exteriorsarticle.htm*. Figure 31 shows the rotational penetrometer tool that can be used to evaluate surfaces. For further information, consult Beneficial Designs' Web site at: *http://www.beneficialdesigns.com/*. One of the results of the project was development of a scientific method for determining firm and stable exterior surfaces.

Figure 125 shows the rotational penetrometer tool that can be used to evaluate surfaces. For further information, consult Beneficial Designs' Web site at: *http://www.beneficialdesigns.com/*.

What sort of surface is firm and stable? In general, if the answer to both of the following questions is *yes*, the surface is probably firm and stable.

- Could a person ride a narrow-tired bicycle across the surface easily without making ruts? (The bicycle tires are similar to large rear wheels of a wheelchair.)
- Could a folding stroller with small, narrow plastic wheels containing a 3-year-old be pushed easily across the surface without making ruts? (The stroller's wheels are similar to the front wheels of a wheelchair.)

While this method for determining firmness and stability isn't scientifically accurate, it has proven to be effective.

Figure 125—Using the rotational penetrometer to determine whether a surface is firm and stable.

"Is the trail width 18 inches (455 millimeters) or less for a distance of at least 20 feet (6 meters)?"

DESIGN TIP—

Determining when trail width is a limiting factor

Measuring the existing trail width is easy—just use a measuring tape to get the side-to-side distance of the narrowest stretch of trail. Figuring out if you're stuck with that width may be a little more difficult. The trail may be less than 18 inches (455 millimeters) wide, but if you can widen it in its current location or move the trail alignment to an area where it can be wider, the limiting factor doesn't apply.

"Is there a trail obstacle at least 30 inches (760 millimeters) high?"

If you find a limiting factor where a condition for departure applies, there's no reason to evaluate the trail beyond that point for successive limiting factors. Just look at the section of trail between the limiting factor or prominent feature and the trail terminus. If there are no limiting factors that would prevent compliance with the FSTAG, proceed to step 3.

Step 3—Apply the Technical Provisions.

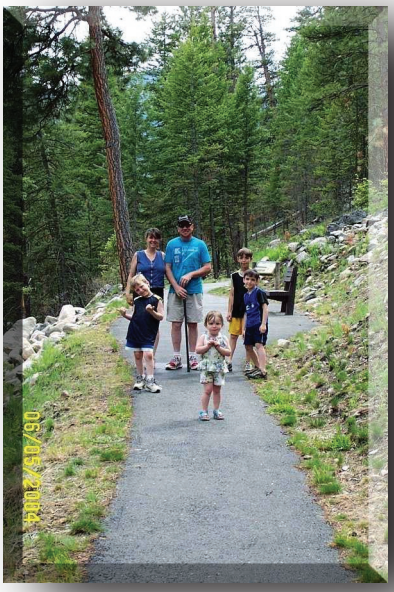
This step involves looking at FSTAG sections 7.3.1 through 7.3.8, which are the provisions for trail grade, cross slope, resting interval, surface, clear tread width, passing space, tread obstacles, protruding objects, and openings. The provisions for edge protection and signs aren't included because they don't affect the accessibility of the trail to the extent the other provisions do.

This summary and the process overview chart do not contain everything you need to know about trail requirements. Designers must refer to the FSTAG for detailed instructions, definitions, conditions for departure, technical provisions 7.0 through 7.3.10, and exceptions.

A series of questions with yes or no answers is asked for each of the provisions listed above, similar to step 2. Let's take trail grade as an example.

First, look at the existing conditions on the ground and determine whether the trail alignment complies with the required grades (1:20 for any distance, 1:12 for up to 200 feet [61 meters], 1:10 for up to 30 feet [9 meters], and so forth). If not, is there a condition for departure that would prevent adjusting the trail alignment or making other changes to achieve compliance? If a condition for departure exists, measure and record the length of the deviation and proceed to the next provision. If the trail alignment complies with the required grades or there is no condition for departure, compliance with the provision for trail grade is required.

Each technical provision is addressed in a similar manner. A determination is made for every provision: either compliance is required, or deviations are permitted. Be sure to measure and record the length of each deviation from a particular provision. Once you have worked through the provisions, proceed to the last step.



If at any point during step 3 you find that the recorded length of deviations from the provisions adds up to 15 percent or more of the total trail length, proceed directly to step 4.

Step 4—Calculate Cumulative Deviation Percentage.
This is the final step in determining how much of the trail must comply with the FSTAG as addressed by general exception 2.

Tally up the measurements of permitted deviations from step 3. If they occur on less than 15 percent of the total trail length, the FSTAG technical provisions apply to the entire trail.

However, if the length of permitted deviations is 15 percent or more of the total trail length, the FSTAG applies to only part of the trail, or may not apply at all.

If the first deviation occurs more than 500 feet (152 meters) feet from one end of the trail, apply the FSTAG from that end of the trail to the first deviation.

If the first deviation occurs less than 500 feet (152 meters) from one end of the trail and a prominent feature is between the end of the trail and the deviation, the FSTAG applies from that end of the trail to the prominent feature.

If the first deviation occurs less than 500 feet (152 meters) from one end of the trail and no prominent feature is between the end of the trail and the deviation, the FSTAG doesn't apply to the trail.

DESIGN TIP—
Applying the process

Figure 126 helps illustrate how to apply the process by calculating cumulative deviations and considering a prominent feature. The drawing shows that:

- Deviations occur on more than 15 percent of the trail because 15 percent of 950 feet = 142.5 feet (15 percent of 290 meters = 43.5 meters), but the deviations total 216 feet (66 meters).
- The first point of deviation occurs 400 feet (122 meters) from the trailhead.
- The vista is only 250 feet (76 meters) from the trailhead.

The trail must comply with the guidelines from the trailhead to the vista. Beyond the vista, the trail does not have to comply with the guidelines.

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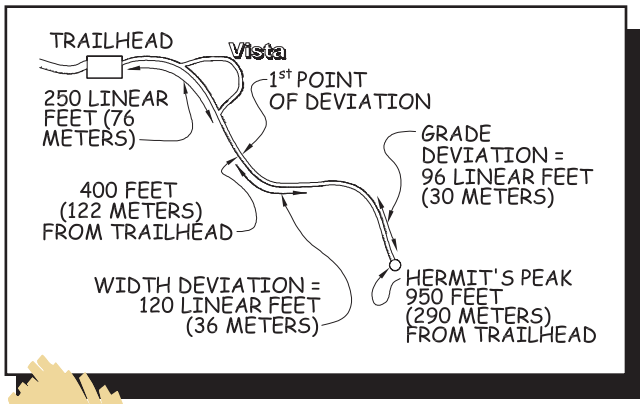

Figure 126—This trail schematic illustrates how to determine where the trail must comply with the FSTAG.

That's all there is to it!

Trail Layout Notes

Overview Chart of the FSTAG Implementation Process

The FSTAG must be applied before initiating new construction or altering any National Forest System trail with a designed use of hiker/pedestrian. Table 4 distills the implementation process into a flow chart that provides easy reference as you work through the process. Before applying the FSTAG, you'll need to:

- Analyze existing conditions, including potential opportunities and constraints (National Environmental Policy Act analysis).
- Identify and verify the desired trail class for the trail or trail segment.
- Identify and verify the designed use of the trail or trail segment.

Table 4—Overview of the FSTAG implementation process: key steps and sequence.

Step 1: Determine applicability of the FSTAG.	Designed use[1] = hiker/pedestrian? **YES** ↓	**NO** → FSTAG does not apply.
	New construction or alteration? **YES** ↓	**NO** → FSTAG does not apply.
	Trail connects to a trailhead or accessible trail? **YES** ↓	**NO** → FSTAG does not apply.
	Proceed to step 2 (Identify presence of limiting factors)	

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Because of the large format of table 4, please turn the page.

Table 4—*(Continued.)*

Step 2: Identify presence of limiting factors General Exception 1 (7.2.1) Note: Seqence for identifying limiting factors may vary and does not need to occur in the order illustrated here.	**TRAIL GRADE** exceeds 20% for 40 feet (12 meters) or more?	**NO** →		**NO** →	
		YES → Document length of trail that exceeds 20% and data source.	Does condition for departure exist?	**YES** →	
	SURFACE *not* firm and stable for 45 feet (14 meters) or more?	**NO** (The surface ***is*** firm and stable.) →		**NO** →	
		YES → (The surface is not firm and stable.) Document surface firmness and data source.	Does condition for departure exist?	**YES** →	
	MINIMUM TRAIL WIDTH less than 18 inches (457 millimeters) for 20 feet (6 meters) or more?	**NO** →		**NO** →	
		YES → Document minimum trail width and data source.	Does condition for departure exist?	**YES** →	
	TRAIL OBSTACLE 30 inches (762 millimeters) or higher across width of trail?	**NO** →		**NO** →	
		YES → Document obstacle type, dimensions, and data source.	Does condition for departure exist?	**YES** →	

					FSTAG may still apply. Proceed to limiting factor for **surface**.
	Is limiting factor more than 500 feet (152 meters) from trail terminus?	**YES** →			FSTAG applies between terminus and this limiting factor or prominent feature. **Proceed to Step 3** (Apply Technical Provisions).
		NO →	Prominent feature present?	**YES** ↗	
				NO →	FSTAG does not apply. Document applicable condition for departure.
					FSTAG may still apply. Proceed to limiting factor for **minimum trail width**.
	Is limiting factor more than 500 feet (152 meters) from trail terminus?	**YES** →			FSTAG applies between terminus and this limiting factor or prominent feature. **Proceed to Step 3** (Apply Technical Provisions).
		NO →	Prominent feature present?	**YES** ↗	
				NO →	FSTAG does not apply. Document applicable condition for departure.
					FSTAG may still apply. Proceed to limiting factor for **trail obstacle**.
	Is limiting factor more than 500 feet (152 meters) from trail terminus?	**YES** →			FSTAG applies between terminus and this limiting factor or prominent feature. **Proceed to Step 3** (Apply Technical Provisions).
		NO →	Prominent feature present?	**YES** →	
				NO →	FSTAG does not apply. Document applicable conditions for departure.
					FSTAG may still apply. **Proceed to Step 3** (Apply Technical Provisions).
	Is limiting factor more than 500 feet (152 meters) from trail terminus?	**YES** →		**YES** →	FSTAG applies between terminus and this limiting factor or prominent feature. **Proceed to Step 3** (Apply Technical Provisions.
		NO →	Prominent feature present?		
				NO →	FSTAG does not apply. Document applicable conditions for departure.

Continued

Table 4—*(Continued.)*

Step 3: Apply technical provisions Technical Provisions (7.3.1 to 7.3.8)	TRAIL GRADE complies with 7.3.1.1?	**YES** →				
		NO →	Does condition for departure exist?	**YES**	Deviation permitted. Measure and record length of deviation.	→
				NO	Deviation not permitted.	→
	TRAIL CROSS SLOPE complies with 7.3.1.2?	**YES** →				
		NO →	Does condition for departure exist?	**YES**	Deviation permitted.[2] Measure and record length of deviation.	→
				NO	Deviation not permitted.	→
	RESTING INTERVAL complies with 7.3.2?	**YES** →				
		NO →	Does condition for departure exist?	**YES**	Deviation permitted.[2] Measure and record length of deviation.	→
				NO	Deviation not permitted.	→
	SURFACE complies with 7.3.3?	**YES** →				
		NO →	Does condition for departure exist?	**YES**	Deviation permitted.[2] Measure and record length of deviation.	→
				NO	Deviation not permitted.	→
	CLEAR TREAD WIDTH complies with 7.3.4?	**YES** →				
		NO →	Does condition for departure exist?	**YES**	Deviation permitted.[2] Measure and record length of deviation.	→
				NO	Deviation not permitted.	→
	PASSING SPACE complies with 7.3.5?	**YES** →				
		NO →	Does condition for departure exist?	**YES**	Deviation permitted.[2] Measure and record length of deviation.	→
				NO	Deviation not permitted.	→

	Comply with trail grade technical provision 7.3.1.1.	
		Proceed to Step 4: calculate cumulative deviation percentage.
	Comply with trail grade technical provision 7.3.1.1.	
	Comply with trail grade technical provision 7.3.1.2.	
		Proceed to Step 4: calculate cumulative deviation percentage.
	Comply with trail grade technical provision 7.3.1.2.	
	Comply with trail grade technical provision 7.3.2.	
		Proceed to Step 4: calculate cumulative deviation percentage.
	Comply with trail grade technical provision 7.3.2.	
	Comply with trail grade technical provision 7.3.3.	
		Proceed to Step 4: calculate cumulative deviation percentage.
	Comply with trail grade technical provision 7.3.4.	
	Comply with trail grade technical provision 7.3.4.	
		Proceed to Step 4: calculate cumulative deviation percentage.
	Comply with trail grade technical provision 7.3.4.	
	Comply with trail grade technical provision 7.3.5.	
		Proceed to Step 4: calculate cumulative deviation percentage.
	Comply with trail grade technical provision 7.3.5.	
		Step 3 continued

Table 4—*(Continued.)*

Step 3: Apply technical provisions Technical Provisions (7.3.1 to 7.3.8)	TREAD OBSTACLES comply with 7.3.6?	**YES →**				
		NO →	Does condition for departure exist?	**YES**	Deviation permitted.[2] Measure and record length of deviation.	→
				NO	Deviation not permitted.	→
	PROTRUDING OBJECTS comply with 7.3.7?	**YES**				
		NO →	Does condition for departure exist?	**YES**	Deviation permitted.[2] Measure and record length of deviation.	→
				NO	Deviation not permitted.	→
	OPENINGS comply with 7.3.8?	**YES →**				
		NO →	Does condition for departure exist?	**YES**	Deviation permitted.[2] Measure and record length of deviation.	→
				NO	Deviation not permitted.	→

Step 4: Calculate cumulative deviation percentage General Exception 2 (7.1.2.2)	CUMULATIVE DEVIATION PERCENTAGE Do permitted deviations occur on less than 15% of total trail length?	**YES →**					
		NO → Deviations occur on more than 15%.	Is first deviation more than 152 meters (500 feet) from trail terminus?				
				YES →			Apply FSTAG technical provisions to entire trail.[3]
				NO →	Does prominent feature exist?		Apply FSTAG technical provisions to segment of trail between terminus and first point of deviation.[3]
						YES →	Apply FSTAG technical provisions to segment of trail between terminus and prominent feature.[3]
						NO →	FSTAG does not apply. Document cumulative deviation percentage.

If you have questions about applying any of the above information, please contact your region's recreation accessibility coordinator. Current contact information is available on the Forest Service's internal computer network at: *http://fsweb.mtdc.wo.fs.fed.us/toolbox/acc/documents/coord.htm*.

	Comply with trail grade technical provision 7.3.6.	
		Proceed to Step 4: calculate cumulative deviation percentage.
	Comply with trail grade technical provision 7.3.6.	
	Comply with trail grade technical provision 7.3.7.	
		Proceed to Step 4: calculate cumulative deviation percentage.
	Comply with trail grade technical provision 7.3.7.	
	Comply with trail grade technical provision 7.3.8.	
		Proceed to Step 4: calculate cumulative deviation percentage.
	Comply with trail grade technical provision 7.3.8.	

[1]Excerpt from *Forest Service Trail Fundamentals* (*www.fs.fed.us/r3/measures/Inventory/Trails.htm*). Definition of designed use: "The intended use that *controls* the desired geometric design of the trail, and determines the subsequent maintenance parameters for the trail…. Of the actively Managed Uses that the trail is developed and managed for, the Designed Use is the *single design driver* that determines the technical specifications for the trail."

Excerpt from Access Board *Recommendations for Accessibility Guidelines: Outdoor Developed Areas, Final Report* (page 11): "*The accessibility guidelines for trails apply to those which are designed and constructed for pedestrian use.* These guidelines are not applicable to trails primarily designed and constructed for recreational use by equestrians, mountain bicyclists, snowmobile users, or off-highway vehicle users, even if pedestrians may occasionally use the same trails. People use these categories of trails by means of transportation other than foot travel or personal mobility device. Design and constructed requirements for equestrians, mountain bikes, OHVs, and snowmobiles are based on the specific requirements for the intended mode of transportation. For the safety of trail users, pedestrian use may not always be permitted on these trails in order to minimize conflicts between motorized and non-motorized recreation. These trails do not preclude use by a person with a disability since it is planned that all trail users would be using the one or more alternative means of transportation for which the trail is designed and constructed. The design and construction of pedestrian trails without consideration of these proposed guidelines, by contrast, could present barriers to some trail users because the intended use is by foot or personal mobility device. For these reasons, the committee intentionally limited the application of the proposed guidelines to pedestrian use trails.

It should be noted that the definition used in these proposed guidelines is not the only definition used by trail designers and manager. Rather, it was developed to specifically define the scope of these guidelines."

[2]If at any point during Step 3 the occurrence of one or more conditions of departure result in permitted deviations from technical provisions on more than 15 percent of the trail length, proceed to Step 4.

[3]Refer to the FSTAG for detailed instructions, definitions, and technical provisions 7.0 through 7.3.

Acronyms

ABA—Architectural Barriers Act
ABAAS—Architectural Barriers Act Accessibility Standards
Access Board—Architectural and Transportation Barriers Compliance Board
ADA—Americans with Disabilities Act
ADAAG—Americans with Disabilities Act Accessibility Guidelines
ANSI—American National Standards Institute
ATV—All-terrain vehicle
BEIG—Built Environment Image Guide
CFR—Code of Federal Regulations
DOD—U.S. Department of Defense
FHWA—U.S. Department of Transportation Federal Highway Administration
FSORAG—Forest Service Outdoor Recreation Accessibility Guidelines
FSTAG—Forest Service Trail Accessibility Guidelines
GFA—General Forest Area
GSA—U.S. General Services Administration
HUD—U.S. Department of Housing and Urban Development
IBC—International Building Code
ISA—International Symbol of Accessibility
ITDS—Interagency Trail Data Standards
MUTCD—Manual of Uniform Traffic Control Devices
OHV—Off-highway vehicle
ORAR—Outdoor Recreation Access Route
RHRIBS—Recreation & Heritage Resources Integrated Business Systems
ROS—Recreation Opportunity Spectrum
RRAC—Regional Recreation Accessibility Coordinator
RV—Recreational Vehicle
TTY—Teletypewriter
UFAS—Uniform Federal Accessibility Standards
USDA—U.S. Department of Agriculture
USPS— U.S. Postal Service

Definitions

Accessibility Evaluation Survey—Comparing each portion of a structure to the accessibility standards and recording compliance and deficiencies.

Accessible—In compliance with the accessibility guidelines at the time the facility or other constructed feature was built or altered.

Alteration of a Recreation Site, Building, or Facility—A change to a portion of a recreation site, building, or facility that is addressed by the accessibility guidelines and that affects the usability of the site, building, or facility.

Alteration of a Trail—A change in the original purpose, intent, or function for which the trail was designed.

Conditions for Departure (from the accessibility guidelines)—Specific circumstances found in natural environments that may make it difficult to comply with the accessibility guidelines.

Construction—Building a new trail, recreation site, or facility where there was none before.

Disability—A medically definable condition that causes a limitation in one or more major life activities such as walking, seeing, hearing, speaking, breathing, thinking, and so forth.

Feasible—Can be accomplished with a reasonable amount of effort or with customary practices.

Firm and Stable Surface—A surface that is not noticeably distorted or compressed and that doesn't shift during the passage of a device that simulates a person using a wheelchair.

General Forest Area (GFA)—For purposes of the Forest Service guidelines, GFAs are all National Forest System lands available for recreational use, other than wilderness areas, where the Forest Service recreation site development scale is 2 or less. Development scale 0 recreation sites do not contain any constructed features, while constructed features in development scale 1 and 2 recreation sites are primarily for resource protection rather than visitor comfort and convenience.

Grab Bar—A bar attached to a wall to provide a handgrip for steadying oneself or to assist in transferring across short distances.

Guardrail—A railing designed to protect people from accidentally falling off an edge where the immediate dropoff is over 30 inches.

Handrail—A narrow railing to be grasped with the hand for support.

Interagency Trail Data Standards—National Trail Data Standards agreed to by the U.S. Department of Agricul-ture Forest Service and the U.S. Department of the Interior Bureau of Land Management, Fish and Wildlife Service, National Park Service, and Bureau of Reclamation.

Limiting Factor—A specific extreme, uncorrectable environmental barrier that makes the trail beyond the barrier unreachable for many people with mobility limitations.

Maintenance—Routine or periodic repair of existing trails, recreation sites, or facilities. Maintenance does not change the original purpose, intent, or function for which the facility was designed.

Pit Toilet—A simple toilet provided in a general forest area with waste disposed directly into the ground or that relies on moldering or composting.

Program Accessibility—Providing all people, including people with disabilities, the opportunity to participate in a program—an activity in which someone may participate or the reason someone visits an area.

Reconstruction—This term is not used in Federal accessibility guidelines or the FSORAG and FSTAG, even though it is used frequently by folks who work in recreation and trails. For the purposes of the FSORAG and FSTAG, actions are categorized as construction, alteration, or maintenance.

Recreation Site—A discrete area on a national forest that provides recreation opportunities, receives use, and requires a management investment to operate or to maintain to standard.

Recreation Site Development Scale—A six-level development scale describing Forest Service recreation site development levels. Definitions of each level are

available at *http://www.fs.fed.us/r3/ measures/Cost/Infra_Files/APPENDIX%20 H_Levels%20of%20Site%20Modification.doc*.

Scoping—The term used for the process of figuring out when, how much, and where the guidelines apply.

Setting—The term used to describe the natural surroundings of a trail or recreation area.

Slope Ratio—A ratio of vertical distance to horizontal distance, or *rise* to *run*.

Technical Provisions—Specific physical characteristics that are required to make the built environment accessible, as identified in the accessibility guidelines.

Trail Classes—Broadly characterize and group trails by desired management characteristics and level of development, while taking into account user preferences, the recreation setting, protection of sensitive resources, and other factors. See the Interagency Trail Data Standards.

Trail Designed Use—The intended use that controls the geometric design of a trail and determines the level to which it should be maintained. See the Interagency Trail Data Standards.

Trail Managed Use—Any mode of travel that is actively managed and appropriate for a specific trail or area. See the Interagency Trail Data Standards.

Trailhead—A site designed and developed by the Forest Service or other government agency, a trail association, trail maintaining club, or other cooperators to provide a staging area for trail use.

Transition Plan—Identifies the changes needed to make a facility accessible and the timeline for completing the changes.

Universal Design—Programs and facilities designed to be usable by all people, to the greatest extent possible, without separate or segregated access for people with disabilities.

Warming Hut—A temporary space or partially enclosed space used briefly for protection from the weather.

Resources

Source Documents

- Forest Service Outdoor Recreation Accessibility Guidelines: *http://www.fs.fed.us/recreation/programs/accessibility/FSORAG.doc*

- Forest Service Trails Accessiblity Guidelines: *http://www.fs.fed.us/recreation/programs/accessibility/FSTAG.doc*

Links

- **7 CFR 15** is the 1994 USDA implementation guideline for Section 504 that prescribes the requirements for ensuring access to programs.
  —Subpart 15b (covers programs operating with Federal agency funding under special use permits or other agreements): *http://www.access.gpo.gov/nara/cfr/waisidx_03/7cfr15b_03.html*
  —Subpart 15e (covers programs conducted by the Forest Service): *http://www.access.gpo.gov/nara/cfr/waisidx_03/7cfr15e_03.html*
  —Section 150d (transition plan development and contents): *http://www.access.gpo.gov/nara/cfr/waisidx_03/7cfr15d_03.html*

- Access Board—*http://www.access-board.gov/*

- Accessibility Guidebook for Outfitters/Guides Operating on Public Lands—*http://www.fs.fed.us/recreation/programs/accessibility/*

- Accessibility Guidebook for Ski Areas Operating on Public Lands—*http://www.fs.fed.us/recreation/programs/accessibility/*

- Accessible Exterior Surfaces Technical Article—*http://www.access-board.gov/research/Exterior%20Surfaces/exteriorsarticle.htm*

- Accessible Handpump—*http://www.fs.fed.us/t-d/programs/eng/handpump.htm*

- ADAAG Accessibility Checklist for Buildings and Facilities—*http://www.access-board.gov/adaag/checklist/a16.html*

- American Trails—*http://www.americantrails.org*

- Americans With Disabilities Act (ADA)—*http://www.access-board.gov/about/laws/ADA.htm*

- Americans With Disabilities Act/Architectural Barriers Act Accessibility Guidelines—*http://www.access-board.gov/ada-aba/*

- Architectural Barriers Act (ABA)—*http://www.access-board.gov/about/laws/ABA.htm*

- Architectural Barriers Act Accessibility Standards (ABAAS)—*http://www.access-board.gov/ada-aba/*

- Backcountry Sanitation Manual—*http://www.appalachiantrail.org/protect/steward/sanman.html*

- Beneficial Designs—*http://www.beneficialdesigns.com/*

- Built Environment Image Guide (BEIG)—*http://www.fs.fed.us/recreation/programs/beig/*

- Designing Sidewalks and Trails for Access
  —Part 1, Review of Existing Guidelines and Practices—*http://www.fhwa.dot.gov/environment/sidewalks/index.htm*
  —Part 2, Best Practices Design Guide—*http://www.fhwa.dot.gov/environment/sidewalk2/index.htm*

- Facilities Toolbox—*http://fsweb.mtdc.wo.fs.fed.us/toolbox/*

- Federal Highway Administration/USDA Forest Service recreational trail publications and videos—*http://www.fhwa.dot.gov/environment/fspubs/index.htm*
  —Paper copies—*http://www.fhwa.dot.gov/environment/rectrails/trailpub.htm*

- Forest Service recreation opportunities—*http://www.fs.fed.us/recreation/*

- Forest Service National Trail Specifications—*http://www.fs.fed.us/database/acad/dev/trails/trails.htm*

- Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG)—*http://www.fs.fed.us/recreation/programs/accessibility/*

- Forest Service Trail Accessibility Guidelines (FSTAG)—*http://www.fs.fed.us/recreation/programs/accessibility/*

- Forest Service Trail Design Parameters—*http://www.fs.fed.us/r3/measures/Inventory/trails%20files/National_Design_Parameters_1_31_2005.doc*

- Infra—*http://infra.wo.fs.fed.us/infra/*

- Interagency Trail Data Standards—*http://www.nps.gov/gis/trails/* and *http://www.fs.fed.us/r3/measures/Inventory/trails%20files/Trail_Class_Matrix_1_31_2005.doc* (Also in the FSTAG: *http://www.fs.fed.us/recreation/programs/accessibility/*)
  —National Trail Management Classes (*http://www.fs.fed.us/r3/measures/Inventory/trails%20files/Trail_Class_Matrix_1_31_2005.doc*)
  —Trail Designed Use and Managed Use Parameters (*http://www.fs.fed.us/r3/measures/Inventory/trails%20files/National_Design_Parameters_1_31_2005.doc*)

- International Building Code (IBC)—*http://www.iccsafe.org/*

- Public Rights-of-Way Accessibility Guidelines—*http://www.access-board.gov/prowac/*

- Recreation & Heritage Resources Integrated Business Systems (RHRIBS, formerly Meaningful Measures)—*http://www.fs.fed.us/r3/measures/*

- Recreation Opportunity Spectrum (ROS)—*http://fsweb.wo.fs.fed.us/eng/facilities/recopp.htm*

- Regional Recreation Accessibility Coordinators (RRAC)—*http://fsweb.mtdc.wo.fs.fed.us/toolbox/acc/documents/coord.htm*

Region/Station Facilities Program Leaders—*http://fsweb.wo.fs.fed.us/eng/documents/fac_leaders.htm*

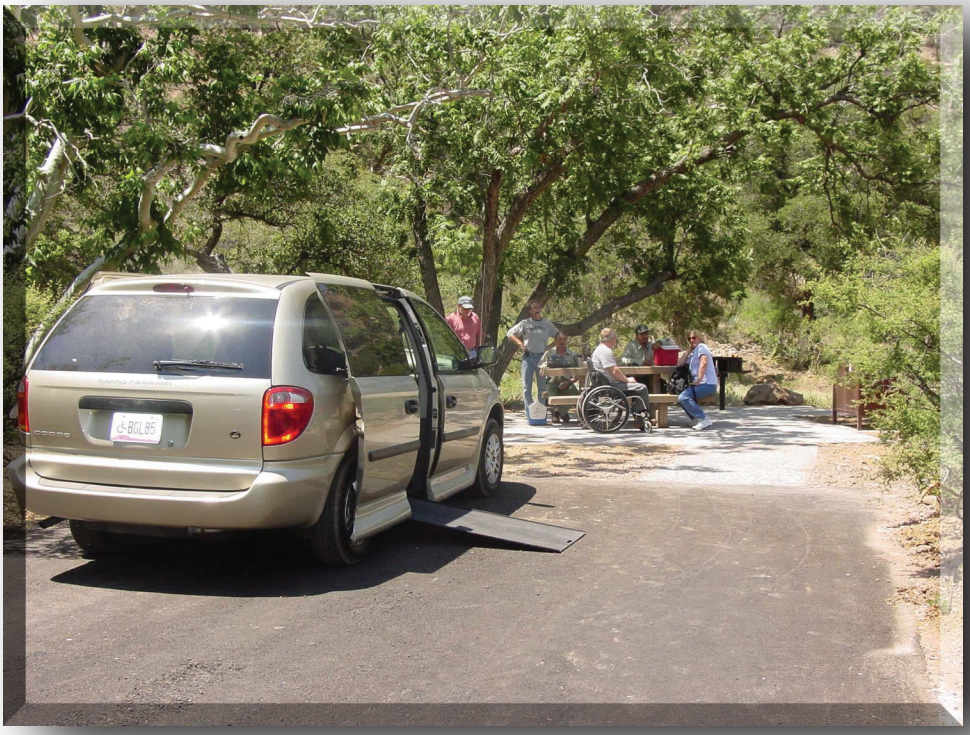
- Rehabilitation Act Section 504—*http://www.access-board.gov/enforcement/Rehab-Act-text/title5.htm*

- Soil Stabilizers on Universally Accessible Trails—*http://www.fs.fed.us/eng/pubs/pdf/00231202.pdf* (Username: t-d, Password: t-d) and *http://www.fhwa.dot.gov/environment/fspubs/ 00231202/*

- Trail Construction and Maintenance Notebook—*http://www.fs.fed.us/eng/pubs/htmlpubs/htm04232825/* and *http://www.fhwa.dot.gov/environment/fspubs/00232839/*

- Uniform Federal Accessibility Standards Accessibility Checklist—*http://www.access-board.gov/ufas/UFAScheckl ist.txt/*

- Universal Design Forest Service Policy, Forest Service Manual Section 2330.5—*http://www.fs.fed.us/im/directives/fsm/2300/id_2330-2005-2.doc*
- Universal Trail Assessment Process—*http://www.beneficialdesigns.com/trails/utap.html#overview%20background*
- Wetland Trail Design and Construction—*http://www.fs.fed.us/t-d/pubs/htmlpubs/htm01232833/* (Username: t-d Password: t-d) and *http://www.fhwa.dot.gov/environment/fspubs/01232833/*
- Wilderness Access Decision Tool—*http://carhart.wilderness.net/docs/wild_access_decision_tool.pdf*



Tips in This Guidebook

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Library Card

Zeller, Janet; Doyle, Ruth: Snodgrass, Kathleen. 2006. Using the Forest Service accessibility guidelines for outdoor recreation and trails. Tech. Rep. 0623–2801–MTDC. Missoula, MT: U.S. Department of Agriculture Forest Service, Missoula Technology and Development Center. 110 p.

This guidebook will help users integrate accessibility into planning, design, construction, and maintenance of outdoor recreation facilities and trails while maintaining the natural setting. It provides detailed information about accessibility requirements in an easy-to-use format, with photos, illustrations, design tips, hotlinks, and sidebars. This guidebook will also help Forest Service personnel, partners, contractors, and Federal and State agencies working in cooperation with the Forest Service understand how to apply the *Forest Service Outdoor Recreation Accessibility Guidelines* and *Forest Service Trail Accessibility Guidelines*.

Keywords: ABA, acronyms, ADA, Americans with Disabilities Act, Architectural Barriers Act, beaches, campgrounds, conditions for departure, definitions, disabilities, Forest Service Outdoor Recreation Accessibility Guidelines, Forest Service Trail Accessibility Guidelines, FSORAG, FSTAG, general exceptions, grills, handpumps, overlooks, parking spaces, picnic tables, showers, slopes, surfaces, terminology, toilets, trails, universal design, wheelchairs

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Electronic copies of MTDC's documents are available on the Internet at: *http://www.fs.fed.us/t-d* (Username: t-d, Password: t-d).

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Forest Service and Bureau of Land Management employees can search a more complete collection of MTDC's documents, videos, and CDs on their internal computer networks at: *http://fsweb.mtdc.wo.fs.fed.us/search.*

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