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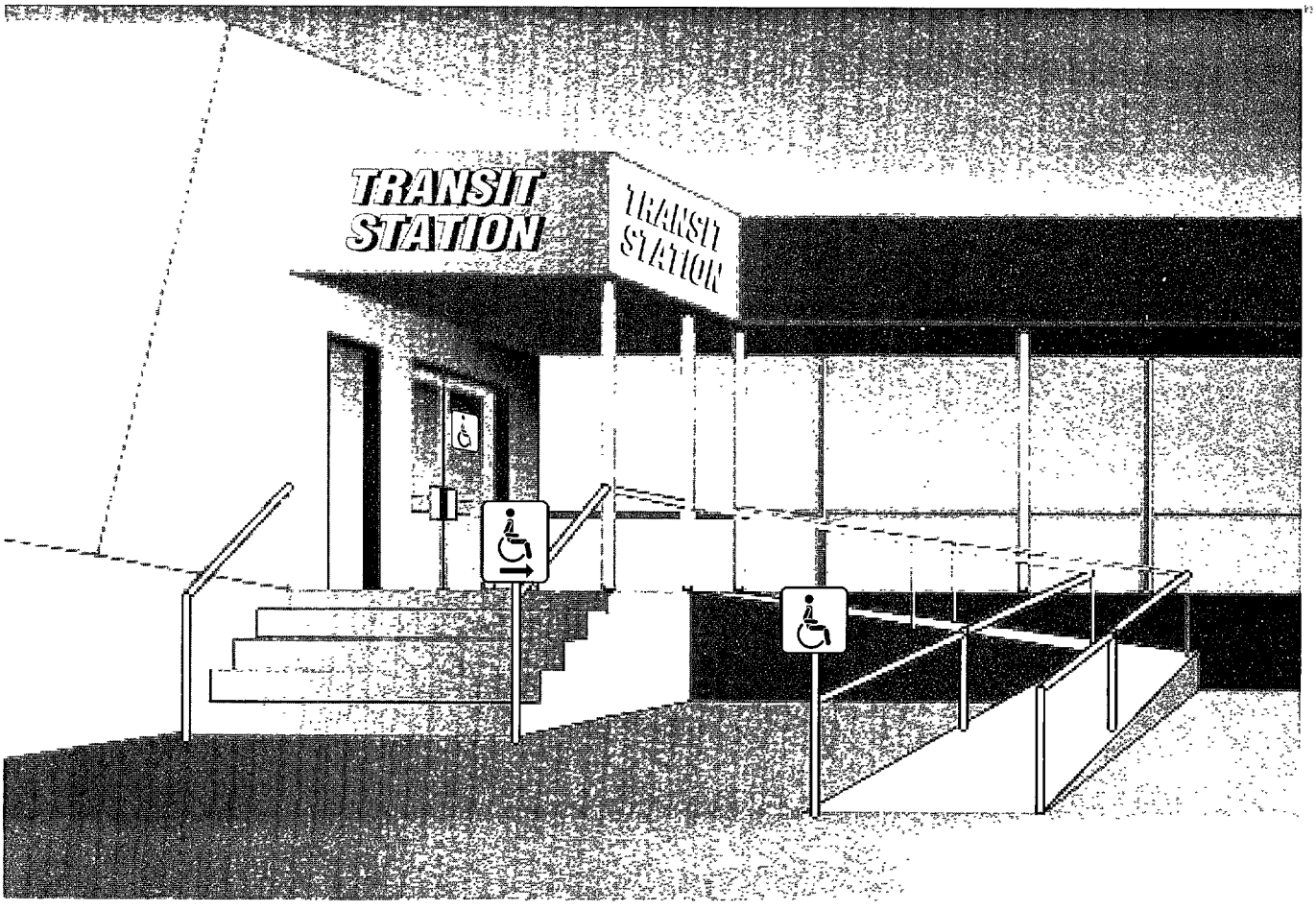
U. S. Department
of Transportation
**Federal Transit
Administration**

ACCESSIBILITY HANDBOOK FOR TRANSIT FACILITIES

Ketron Division of the
Bionetics Corporation
350 Technology Drive
Malvern, PA 19355

July 1992



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6. AUTHOR(S)
John N. Balog, David Chia, Anne N. Schwarz, R. Benjamin Gribbon

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
KETRON Division of The Bionetics Corporation
350 Technology Drive
Malvern,PA 19355
58 Charles Street
Cambridge, MA 02141

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This document is a handbook that will help architects, engineers, and transit system managers to understand and follow the Federal Government regulations contained in the Final Rule, 49 CFR Part 37, which describes the requirements for transportation facilities to be accessible to persons with disabilities. This Handbook explains what is required by th regulations in language that is easy to understand and includes a large number of illustrations which further clarify the requirements for accessibility. This Handbook will make it easier for planners to ensure the accessibility of facilities by offering clear directions, helpful suggestions, and relevant examples of accessible features.

The major areas of accessibility addressed are transit facilities and the ADA, facility site and entrances, interior elements, and waiting and boarding areas. Included in this Handbook are facilities accessibility checklists which ask nunerous questions about facilities and vehicle requirements. Using the checklists, anyone assessing the accessibility of a facility can answer the questions and use the responses to determine where accessible features need to be added or improved.

This Handbook is a companion to the Final Rule and is a reference source for questions about transit facility accessibility.

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METRIC/ENGLISH CONVERSION FACTORS

ENGLISH TO METRIC

LENGTH (APPROXIMATE)

1 inch (in) = 2.5 centimeters (cm)
1 foot (ft) = 30 centimeters (cm)
1 yard (yd ▫ 0.9 meter (m)
1 mile (mi) = 1.6 kilometers (km)

AREA (APPROXIMATE)

1 square inch (sq in, in^2 = 6.5 square centimeters (cm^2)
1 square foot (sq ft, ft^2 = 0.09 square meter (m^2)
1 square yard (sq yd, yd^2) = 0.8 square meter (m^2)
1 square mile (sq mi, mi^2) = 2.6 square kilometers (km^2)
1 acre = 0.4 hectares (he) = 4,000 square meters (m^2)

MASS - WEIGHT (APPROXIMATE)

1 ounce (oz) = 28 grams (gr)
1 pound (lb) = .45 kilogram (kg)
1 short ton = 2,000 pounds (Lb) = 0.9 tonne (t)

VOLUME (APPROXIMATE)

1 teaspoon (tsp) = 5 milliliters (ml)
1 tablespoon (tbsp ▫ 15 milliliters (ml)
1 fluid ounce (fl oz) = 30 milliliters (ml)
1 cup (c) = 0.24 liter (l)
1 pint (pt) = 0.47 liter (l)
1 quart (qt) = 0.96 liter (l)
1 gallon (gal) = 3.8 liters (l)
1 cubic foot (cu ft, ft^3) = 0.03 cubic meter (m^3)
1 cubic yard (cu yd, yd^3) = 0.76 cubic meter (m^3)

TEMPERATURE (EXACT)

[(x-32)(5/9)] ^oF ▫ y ^oC

METRIC TO ENGLISH

LENGTH (APPROXIMATE)

1 millimeter (mm) = 0.04 inch (in)
1 centimeter (cm) = 0.4 inch (in)
1 meter (m) = 3.3 feet (ft)
1 meter (m) = 1.1 yards (yd)
1 kilometer (km) = 0.6 mile (mi)

AREA (APPROXIMATE)

1 square centimeter (cm^2) = 0.16 square inch (sq in, in^2)
1 square meter (m^2) = 1.2 square yards (sq yd, yd^2)
1 square kilometer (km^2) = 0.4 square mile (sq mi, mi^2)
1 hectare (he) = 10,000 square meters (m^2) = 2.5 acres

MASS - WEIGHT (APPROXIMATE)

1 gram (gr) = 0.036 ounce (oz)
1 kilogram (kg) = 2.2 pounds (lb)
1 tonne (t) = 1,000 kilograms (kg) = 1.1 short tons

VOLUME (APPROXIMATE)

1 milliliters (ml) ▫ 0.03 fluid ounce (fl oz)
1 liter (1) = 2.1 pints (pt)
1 liter (l) = 1.06 quarts (qt)
1 liter (l) = 0.26 gallon (gal)
1 cubic meter (m^3) = 36 cubic feet (cu ft, ft^3)
1 cubic meter (m^3) = 1.3 cubic yards (cu yd, yd^3)

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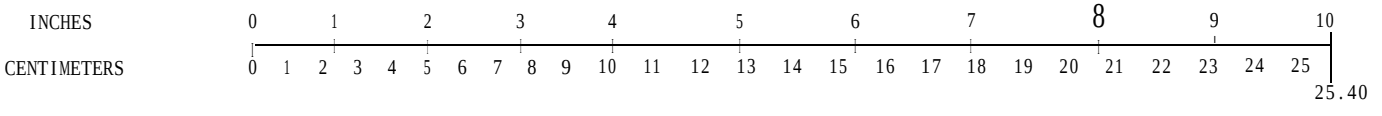
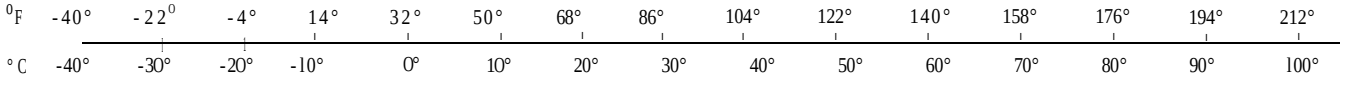


QUICK FAHRENHEIT-CELSIUS TEMPERATURE CONVERSION



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Preface

The Americans with Disabilities Act of 1990 was designed to ensure the rights of individuals with disabilities. The U.S. Department of Transportation published regulations in September 1991 to establish specific requirements of the legislation regarding transit and paratransit services. The **Accessibility Handbook for Transit Facilities** provides expanded information about accessibility of facilities and the activities that transit systems will need to undertake in order for transit facilities to be accessible as defined in the law.

The **Handbook** provides detailed information to help transit designers and planners to construct and renovate transit facilities so that they are accessible to individuals with disabilities of all types, including mobility impairments requiring the use of a wheelchair. The **Handbook** includes all the accessibility requirements contained in the regulations, as well as additional information and suggestions. The language of the document consistently includes terms such as “must be” and “required” for those elements required by the regulations. Terms such as “suggest” and “should be” are used for features that are not required but would improve accessibility.

The Handbook is organized so that adjacent portions of the facility are grouped in the same section. In this way, the **Handbook** can be used during the planning process to ensure that any changes or construction will result in increased accessibility for the users of the transit facility. The use of the **Handbook** in existing facilities will help planners identify how they can improve the accessibility of the facilities without renovation.

Facilities Accessibility Checklists

The appendix is a set of checklists for use when looking at existing facilities or planning construction or alteration of transit facilities. The checklists follow the information in the **Handbook** and provide references to additional information in the **Handbook** as well as in the regulations themselves. Since the checklists can be removed from the document and copied, they are easy to use for each feature of each facility in a system. They can also be used to measure the accessibility gained each time a facility is changed.

ADA Regulations

The ADA regulations themselves-49 CFR Parts 27, 37 and 38: Transportation for Individuals with Disabilities; Final Rule-are included as part of this document. They provide additional information, but the **Handbook** itself contains all the information needed to make transit facilities accessible.

Ongoing Use of the Handbook

This document will be useful on a continuing basis because accessibility features will have to be included whenever facilities are changed-by additions, improvements, or renovations. Accessibility features as described in this document will also have to be included when new facilities are built, and new facilities will continue to appear as transit systems across the country expand and improve their service.

The authors are grateful for the opportunity to assist transit systems in increasing the accessibility of their facilities; in complying with federal regulations; and, most important, in increasing the opportunities for individuals with disabilities to use available transportation facilities.

The authors wish to thank Albert Neumann, Senior Mechanical Engineer at the Federal Transit Administration, for his sponsorship of the project. His support made this **Handbook** possible. William Hathaway, Principal Investigator at the Volpe National Transportation Systems Center, guided this document through its creation, and the authors are grateful for his assistance. They would also like to thank Patricia Ryan, Program Manager at the Volpe National Transportation Systems Center, for her valuable assistance in the entire production of this document. Her dedication to the **Handbook** was a major element in its completion.

At the Architectural and Transportation Barriers Compliance Board, Dennis Cannon offered important assistance and advice on the design of transit facilities. At the Massachusetts Bay Transportation Authority, Alice Fernandes and Robert Adduci provided valuable information and assistance. Judy Byman and Norman Ketola contributed to the information that was included in the **Handbook.**

The authors offer their gratitude and appreciation to Debi Haas for her exceptional production skills and to Lenna Holt for her assistance in editing the final document.

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1. INTRODUCTION

The Americans with Disabilities Act (ADA) of 1990 provides a sweeping range of rights and responsibilities for persons with disabilities. Its stated purpose is:

+ "to provide a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities;

+ "to provide clear, strong, consistent, enforceable standards addressing discrimination against individuals with disabilities;

+ "to ensure that the Federal Government plays a central role in enforcing the standards established in the Act on behalf of individuals with disabilities; and

+ "to invoke the sweep of congressional authority . . . to address the major areas of discrimination faced day-to-day by people with disabilities.'"

The ADA addresses issues of employment, services, and accommodations. It applies to both government agencies and private businesses that serve the public-whether or not they receive government funds. Unquestionably, the ADA will most strongly affect the transit industry. The rest of this section describes the purpose of the **Handbook,** its users, and an overview of the topics covered.

1 .1 PURPOSE

Architects, engineers, and others should understand and follow the specific regulations on accessibility in terms of transportation facilities. The **Handbook** explains the 1991 federal regulations concerning these facilities. The U.S. Department of Transportation (US DOT) has also developed ADA guidelines for two other areas: complementary paratransit service and vehicle specifications.

When the ADA became law in July 1990, it did not include the specific design standards for accessible public facilities. US DOT and the Architectural and Transportation Barriers Compliance Board (Access Board) worked to develop these standards; and in early 1991, the Access Board proposed a rule for facility accessibility. On September 6, 1991, the Access Board and US DOT issued the Final Rule, which sets forth the transportation standards for the ADA. The key regulations for transportation facilities are contained in 49 CFR Part 37. Appendix A to Part 37 includes the facilities specifications that the Access Board developed. A copy is attached at the end.

Although the Access Board specifications are quite detailed, they generally provide minimum or least restrictive standards and sometimes include suggestions in an appendix. The Handbook often recommends specifications or activities beyond those contained in the regulations. The difference between the actual regulations and the **Handbooks'** recommendations is the wording. The terms, "must," "have to," and "require," for example, apply to regulations; the terms, "suggest," "should," and "would be a good idea," for example, apply to recommendations.

The Handbook frequently cites the portion of the regulation being explained. These citations serve, in part, as a reminder: the **Handbook** is a companion to the Rule, not a replacement. The **Handbook is a** reference source for questions about transit facility accessibility. The Final Rule gives the exact wording of the regulations. In addition, the "Section-by-Section Analysis" of 49 CFR Parts 27, 37, and 38 and the '"Construction and Interpretation" of 49 CFR Part 37 (attached at the end) offer further comments on the Final Rule.

1.2 USERS

The Handbook helps users by providing most of the specifications included in the facility regulations. The terminology is nontechnical for the most part, and a glossary provides the meaning of terms that may be unfamiliar.

The following professionals will find the **Handbook** useful in their work:

1. Transit administrators and planners, supervisors of construction, and all personnel who oversee the development, alteration, and construction of transit facilities;

2. Architectural and engineering staff who need an overview of accessibility regulations throughout a facility before preparing detailed designs;

3. Other transit staff involved with aspects of implementing the ADA, for example, those responsible for vehicle specifications and procurement and those involved in routes and schedules for fixed-route service;

4. Federal, state, and local government officials who review facility plans and may be involved in choosing key stations or ruling on disproportionate costs; and

5. Agencies (both public and private) and advocacy groups that work with transit users with disabilities.

The Handbookshould help the transit system, whether it operates buses only or several modes of transportation. Although some material applies more directly to rail modes (light rail, rapid rail, commuter rail, and intercity rail), other specifications and recommendations are appropriate for all modes of transit; large or small systems; and urban, suburban, or rural settings.

1.3 OVERVIEW

Following this introductory material are four sections and an appendix, a glossary, and an index. The four sections and the appendix are briefly described next.

Section 2, Transit Facilities and the ADA, summarizes a number of ADA transit regulations, including the rules for paratransit service, vehicle acquisition, the vehicles themselves, and other types of facilities that may be located in a station. This section also summarizes transit facility regulations, for example, the rules for altering existing facilities and the deadlines for achieving accessible facilities.

Section 3, Site and Entrance, is the first of three sections describing a trip through a transit facility. This section presents specifications for the area surrounding a facility. Topics include station visibility, entrances, and maneuvering space around doors.

Section 4, Interior Elements, looks at the inside of a facility. This section discusses the accessibility standards for fare selling and collection devices; paths, including stairs, ramps, elevators, and escalators; and other features of a facility, for example, signs, public address systems, restrooms, and emergency alarms.

Section 5, Waiting and Boarding, travels to the locations where passengers will be getting on and off the vehicles. This section covers the regulations for waiting areas, platforms, signs, bus stops and shelters, and transfer areas.

The appendix, **Facilities Accessibility Checklists,** consists of numerous questions about the requirements and recommendations for accessible facilities and vehicles.

The text may contain references to previous sections. For example, a facility has signs in its parking area, inside the station, and at its waiting and boarding areas, so Sections 3, 4, and 5 all mention specifications for signage. To make the Handbook more concise, a full discussion of sign specifications appears only once, in Section 3. However, slight variations in specifications are given wherever they occur.

The format of the **Handbook** allows space for margin notes, such as additional design standards of a specific state or transit system. The format also provides for updates: as the government revises the Final Rule and as the transit industry develops new ideas for improved accessibility.

2. TRANSIT FACILITIES AND THE ADA

An understanding of the context for facility guidelines must precede the details of designing and constructing accessible facilities. This section provides that context and presents other issues that relate to accessible transportation facilities, as follows:

- key themes of transit facility accessibility;
- overview and summary of facility guidelines;
- rules on altering existing facilities;
- selection of key stations;
- relationship between facility guidelines and other ADA transit guidelines; and
- timetables for accessibility.

2.1 KEY THEMES

Nearly all transit systems, regardless of their size and extent, have facilities for the riding public. A facility can be a large multilevel, multimodal, even multipurpose complex. A facility can also be a bus **shelter or a parking lot. Making facilities accessible means making them** easier to use. Under the ADA, accessibility is the legal obligation of the transit system and is a sound policy for system marketing and finances.

The tendency is to think of disabled people as a small and distinct portion of the general population. Following this line of thinking could lead to the conclusion that accessibility is a worthy goal for a transit system, but benefits only a small group of its riders. However, all users benefit from accessibility. Everyone benefits from signs that are large and easy to read. Everyone benefits from direct and clearly marked walkways in parking lots. Everyone benefits from clear and audible

public address systems. Everyone benefits from ticket counters, telephones, and vending devices that are easy to find and reach.

In addition, most people will, at one time or another, find that moving about is more difficult than usual. An injury or temporary disability may develop from pushing a stroller or carrying luggage or tending to small children. At any moment, those who usually give no thought to climbing a flight of stairs may be thankful that a ramp or elevator is available.

Other segments of the system's ridership benefit from accessibility. New riders who are unfamiliar with a facility will be able to find their way more easily with clear markings and signs and direct paths to their destination. Second, many riders in the system may not qualify as paratransit eligible under the ADA (or the system's) criteria, but may move more slowly or not see or hear well. Many elderly riders fit in this category.

Accessibility helps everyone. Under the ADA, systems must meet specific requirements: physical specifications, performance standards, and timetables for implementation. The accessibility plans should not be seen as an obligation, but as an opportunity to make the system more attractive to all riders.

Accessible facilities can also save money for the system. Providing a trip on a fixed-route service is much less expensive than providing that same trip with a paratransit system. Under the ADA definitions for paratransit eligibility, "Category 2" individuals are people who would use a fixed-route service if that service were completely accessible. Therefore, the more accessible a fixed-route service (including vehicles), the fewer Category 2 registrants the paratransit service will have. If the fixed-route system becomes completely accessible, no Category 2 registrants should be using the paratransit service.

An investment in creating accessible facilities quickly leads to direct cost savings for the operations. As discussed in **Sections 2.4.1, Key Station Designation Criteria,** and 2.4.2, **Key Stations and Complementary Paratransit Service,** the choice of key stations and other

facilities that will become accessible should consider the most common origins and destinations of the disabled community.

2.1 .1 IMPAIRED MOBILITY AND OTHER DISABILITIES

People with less noticeable disabilities are easy to overlook in system planning. The usual image of a disabled person is someone who uses a wheelchair or other mobility aid, such as a cane, crutch, or walker. People who are visually or hearing impaired or with cognitive disabilities also need help in moving through a transportation facility. Thus, planning for accessibility should also consider the requirements of these passengers.

Like people with limited mobility, people with sensory or cognitive disabilities vary in the degree to which they can still use their sensory abilities. For example, people with limited vision may be able to read signs if they stand close enough. They may be able to distinguish shapes or sharp contrasts in color. People with limited hearing may be able to read lips or use a hearing aid to understand voices on a public address system. Some people with cognitive disabilities can be travel-trained to reach a transit stop or station, get on the proper vehicle, get off at the right stop or station, and head to their final destination.

A transit system can help people with these types of disabilities through a variety of specific accessibility features. **Section** 3, **Site** and **Entrance; Section 4, interior Elements;** and **Section 5 Waiting and Boarding,** discuss these features in detail. The following ihemes should be considered when designing details of the station:

+ large signs and letters;

+ simple symbols;

+ sharp color contrast;

+ simple and consistent floor plans; and

+ repeated (and consistent) directions.

2.1.2 EXISTING FACILITY RULES

Accessibility is not a new idea for transit; many transit systems have been designing accessible facilities for a number of years. The key federal laws include the Architectural Barriers Act of 1968 and Section 504 of the Rehabilitation Act of 1973. Section 504 requires overall program accessibility for federally funded transit programs. The Architectural Barriers Act requires accessibility for all facilities and buildings constructed by recipients of federal funds. The Uniform Federal Accessibility Standards (UFAS) set forth the standards for accessibility. The Architectural and Transportation Barriers Compliance Board (the Access Board) is the federal agency responsible for assuring that transportation facilities comply with UFAS. The ADA accessibility Guidelines (ADAAG) is contained in the Final Rule (specifically, Appendix A of 49 CFR Part 37) relating to the transportation provisions of the ADA. Since ADAAG is based on UFAS, most of its provisions should be familiar to transit entities. Transit systems can consult the Access Board about their technical questions on facility standards.

Many state and local governments have established their own requirements for accessibility to buildings and public facilities. For example, the Massachusetts Architectural Accessibility Board (MAAB) has established standards for public accommodations in that state. Transit systems in Massachusetts must comply with the MAAB standards when they build or alter facilities. In some cases, UFAS, ADAAG, and MAAB standards are the same. In Massachusetts, when the two standards differ, the transit system must follow the stricter standard. A number of other states and localities have their own requirements for facility accessibility. Any system has to be aware of local requirements in addition to those of the ADA. In general, the local standards take precedence when they are stricter than the federal standards and vice versa.

2.1.2.1 Private Entities

Under the provisions of the ADA, private entities are covered under different rules for their facility accessibility. The U.S. Department of Justice, rather than US DOT, has the regulatory and enforcement authority over the facilities of private entities.

2.1.2.2 Facilities **Covered by Previous Regulations**

The regulations provide some flexibility for transit facilities constructed or altered before January 26, 1992. US DOT considers facilities accessible if they met the appropriate standards at the time of construction or alteration. The standards are either **UFAS** or, for a facility altered or constructed without federal money, the American National Standards Specifications for Making Buildings and Facilities Accessible to and Usable by the Physically Handicapped (ANSI Al 17.1 (1980)).

When this provision is applied to facilities, the **ability to** "grandfather" accessibility applies only to the specific elements that are constructed or altered, not to the entire facility. For example, if the entrance was reconfigured to meet old accessibility standards, the rest of the facility is still subject to the new standards. Also, when new standards have no corresponding old standard, the altered facility must comply with the new requirements.

This section of the Final Rule (49 CFS 37.9) was inserted because US DOT did not want to penalize transit systems for following the old standards. **It** applies mainly to the **kev** stations that transit systems have already been making accessible. At the same time, US DOT wants to have as consistent a set of accessibility standards as practicable.

2.1.3 TRANSIT ROLE IN ACCESSIBILITY

As stated in the ADA mandates, people with disabilities must have the same opportunity and access to transit that all other Americans have. Transit in this country has always played a large role in providing opportunity and access to all people. Transit facilities comprise one component of a more accessible environment for disabled people. Eventually, all public accommodations, whether owned by a public or private entity, will have to be altered or constructed to allow equal access. Transit plays a key role for two reasons. First, it is the means for people to reach these other accommodations. Without accessible transit, many people would not have the chance to **use** other community elements that have become accessible. Second, because transit is so

visible, disabled people look to transit to take a leading role in carrying out the ADA.

Transit facilities are just one component of an entire transit system; accessibility also depends on vehicles and operations. **Section 2.6 Transportation Facility Guidelines and Other ADA Transit Guidelines,** discusses the relationship between the two guidelines.

2.2 SUMMARY OF FACILITY GUIDELINES

On September 6, 1991 , US DOT issued the Final Rule for the transportation provisions of the ADA. This Rule is included in 49 CFR Parts 37 and 38, along with amendments to 49 CFR Part 27. The Rule covers three broad topics: vehicles, service, and facilities. Also on September 6, 1991, the Access Board issued Final Guidelines concerning transportation facilities (36 CFR Part 1191) and vehicles (36 CFR Part 9 192).

Many who are involved with paratransit are already familiar with portions of 49 CFR Part 37, primarily Subparts F and G. Subpart C of this regulation specifically deals with transportation facilities. Appendix A of 49 CFR Part 37 includes the standards that the Access Board developed for accessible transportation facilities. Subpart A of this regulation includes general information, definitions of words, and phrases. Those definitions that are relevant to transit facility accessibility appear in the Glossary of the Handbook.

The following paragraphs provide a quick view of the sections within 49 CFR Part 37, Subpart C (CFR 37.49 to 37.69) and CFR 37.9, another key section dealing with facilities. The full text of the regulation appears at the end of the **Handbook.**

37.9 Standards for accessible transportation facilities. This section covers several separate administrative issues. First, a transportation facility is considered "'readily accessible" if it meets the requirements of 49 CFR Part 37, including Appendix A. Second, portions of a facility can be considered accessible if they were constructed or altered to meet UFAS or ANSI Al 17.1 (1980). This "grandfathering'" of accessibility applies only to individual components

that a system constructed or altered before January 26, **1992** to meet those standards, and does not apply to the entire facility. Furthermore, components not covered in UFAS or ANSI Al 17.1 but covered in this Rule must be made accessible to comply with this Rule.

Third, bus systems often do not have control over the construction of their bus stops. But whenever a bus system does have such control, it must follow the standards for bus stop pads (49 CFR 37: ***Section 10.2. 1(1) of Appendix A).*** It must also exercise whatever control it has to ensure compliance.

Fourth, this section explains how a system can apply to the FTA or the Federal Railway Administration (as appropriate) for "equivalent facilitation" in relation to a specification in Appendix A.

37.41 Construction of transportation facilities **by public entities.** Any new transportation facility that a public entity builds must be accessible. For bus, rapid rail, and light rail, this ruling applies for construction that began (i.e., a notice to proceed is issued) after January 25, 1992. For intercity and commuter rail stations, the date is October **7, 1991.**

37.43 Alteration of transportation facilities by public entities. This section discusses the requirements for a public entity altering an existing facility. First, when a public entity alters part or all of a facility, the alteration must result in the facility (or its altered portion) becoming accessible to disabled individuals.

Second, if the alteration involves a key area ("primary function") of the facility, then the public entity must also create an accessible path to the altered area. Primary functions areas include ticket purchase areas, passenger waiting areas, train and bus platforms, and baggage check and pickup areas. **In** addition, accessible paths must be created between the altered primary function area and accommodations such as bathrooms, drinking fountains, and telephones.

Public entities are not obligated to make accessibility alterations to the path of travel that are "disproportionate" in cost. Disproportionate is defined as more than 20 percent of the total cost of alterations to the

primary function areas. The entity must make as many changes as possible to the path of travel up to the 20 percent. Costs attributable to accessibility changes must be carefully calculated and "gold-plating" avoided (such as, counting the cost of a new door when adding a new handle to an old door would be enough for accessibility).

These requirements apply to alterations that began after January 26, 1992. For commuter and intercity rail, these requirements apply to alterations that began after October 7, 1991. More details about alterations are provided in **Section 2.3, Alteration of Existing Transportation Facilities.**

37.45 Construction and alteration of transportation facilities by private entities. For a private organization, requirements for new or altered construction are covered by the Department of Justice regulations (28 CFR Part 36).

37.47 Key stations in light and rapid rail systems. If the transit authority operates a light rail or rapid rail system, it must prepare a plan for the accessibility of the system's key stations and submit it to the **FTA** by July 26, 1992. In general, these stations must be accessible by July 26, 1993. However, for extraordinarily expensive station alterations the FTA may grant an extension to July 26, 2020, provided that two-thirds of the key stations are accessible by July 26, 2010.

CFR 37.47 proposes a number of criteria to identify the system's key stations as described in **Section 2.4.1, Key Station Designation Criteria.**

37.49 Designation of responsible person(s) for intercity and commuter rail stations. This section explains how to determine who is financially and legally responsible for making commuter and intercity (Amtrak) rail stations accessible. The owners and users of the station may come up with an alternate plan for assigning responsibility. **Section 2.5.3, Designation of Responsibility,** provides a full explanation of the methodology for determining responsibility.

37.51 Key stations in commuter rail systems. The provisions in this section are similar to the provisions in CFR 37.47. The difference

for commuter rail systems is that the FTA may grant an extension to July 26, 2010 for accessibility at all key stations (not July 26, 2020).

The proposed criteria for identifying a system's key commuter rail stations are the same as those for light and rapid rail stations. In the **Handbook, Section 2.5, Key Stations in Commuter and Intercity Rail Systems,** describes these criteria.

37.53 Exception for New York and Philadelphia. These two cities have separate agreements concerning their key station planning. These agreements are specific for these cities. Other systems cannot use these agreements as standards for their key station plans.

37.55 Intercity rail station accessibility. All Amtrak stations must be accessible by July 26, 2010.

37.57 Required cooperation. Under the agreement reached in CFR 37.49, the entity responsible for making a commuter or Amtrak rail station accessible does not have to be the station owner. If this situation occurs, the owner must provide "reasonable cooperation" to the responsible entity in its efforts to make the station accessible.

37.59 Differences in accessibility completion dates. Different portions of a single station may have different dates for becoming accessible. This situation may occur if the station serves more than one mode, or simply if the responsible entity sets different timeframes for stages of the alterations. However, work on the later alterations should not prevent people from using the alterations that have become accessible.

37.61 Public transportation programs and activities in existing facilities. This section of the Rule is concerned with the programs and activities that take place in transportation facilities. Facilities that are not undergoing physical alterations to make them accessible still require changes to improve their accessibility. These changes should help people with mobility and other types of disabilities (hearing, vision, mental); however, the alterations do not include making the facilities accessible to wheelchairs.

Examples of such changes include improved lighting and signage, more direct paths to key area, clearer public address systems, larger schedule boards, and tactile strips on platform edges.

2.3 ALTERATION OF EXISTING TRANSPORTATION FACILITIES

Whenever alterations to an existing facility will have an impact on the usability of the facility, the altered portions, to the maximum extent feasible, must be readily accessible to and usable by individuals with disabilities, including those who use wheelchairs (CFR 37.43).

When alterations affect the portion of the facility containing a primary function, such as ticket purchase and collection areas, passenger waiting areas, train or bus platform areas, baggage checking areas, and employment areas, the path of travel must be made accessible. The path of travel to and from the altered area and to bathrooms, telephones, and drinking fountains serving the altered area must also be accessible.

A path of travel is a continuous, unobstructed way of pedestrian passage. With an accessible path of travel, individuals with disabilities, including those who use wheelchairs, can move into and out of the altered area; to and from bathrooms, telephones, and drinking fountains; and to and from an exterior approach, including an entrance, sidewalks, parking, and the street. The accessible path of travel also includes any features for complete accessibility, such as curb ramps, ramps, clear floor paths along corridors, waiting areas, concourse, parking access aisles, elevators, lifts, bridges, tunnels, or other passages between platforms.

2.3.1 MAXIMUM EXTENT FEASIBLE

Occasionally, a facility cannot be altered to fully comply with accessibility standards. In these cases, the facility must be accessible to the maximum extent feasible. If any portion can be accessible, it must be accessible. if a portion of the facility can be accessible to individuals with one disability, but not to those with other disabilities, it must be altered to be accessible to the group with one disability.

For example, if a facility cannot be altered to accommodate individuals who use wheelchairs, but can be accessible to those who use crutches and those who have impaired vision, hearing, or other disabilities that do not require the use of a wheelchair, the facility must be altered to accommodate those to whom it can become accessible. If the transit system cannot install elevators and ramps, it must still install Braille and raised letter signs, audible alarms, and public information systems.

2.3.2 DISPROPORTIONATE COST

If the costs to alter the path of travel, restrooms, telephones, and drinking fountains for accessibility exceed 20 percent of the total cost of the alteration to the primary function area, the additional costs for accessibility are considered disproportionate, and it is not necessary to install all accessibility features. However, it is still necessary to provide as many accessibility features as possible up to the 20 percent.

Costs that can be counted as additional expenditures required to provide accessibility to a primary function area include (CFR 37.43):

1. Costs of providing an accessible entrance and route to the altered area, for example, costs for widening doorways and installing ramps;
2. Costs of making restrooms accessible;
3. Costs of providing accessible telephones; and
4. Costs of relocating an inaccessible drinking fountain.

When the costs of adding accessible features are disproportionate to the cost of the overall alterations, accessible features should be added to the alterations according to the following priority list ***(Section 37.43):***

1. Accessible entrance;

2. Accessible route to the altered area;

3. At least one accessible restroom for each sex, or one unisex restroom (see Note);

4. Accessible telephones;

5. Accessible drinking fountains; and

6. Other accessible elements, such as parking, storage, and alarms.

Note: When a facility has only one restroom, it must be accessible. When it has two, one should be for men and one for women; both should be accessible.

When making a series of alterations, over time, to an area containing a primary function of the station, the total cost of all alterations determines whether the costs for accessible features are disproportionate. The total cost of a series of alterations to the primary function areas during a 3-year period must be considered in determining whether the cost of making the travel path accessible is disproportionate (CFR 37.43). However, only alterations made after January 26, 1992 will be considered as part of the 3 years.

2.4 KEY STATIONS IN LIGHT AND RAPID RAIL SYSTEMS

For light rail, rapid rail, and rail transit systems, certain stations must be designated as key stations. In addition to changes during other alterations, key stations must become accessible as soon as practicable,

but no later than July 26, 1993, unless an extension is granted (CFR ***37.47 and 37.57).***

In addition to the requirement that stations be made accessible when alterations are undertaken, key stations will have to be accessible by July 26, 1993. Rail systems must consult individuals with disabilities and conduct public hearings to help determine key stations.

The following criteria are important in choosing key stations for light and rapid rail systems (CFR 37.47):

1. Stations at which passenger boarding exceeds average station boarding on the system by at least 15%, unless such stations are close to another accessible station;

2. Transfer stations on a rail line or between rail lines;

3. Major interchange points with other transportation modes, including major parking facilities, bus terminals, intercity or commuter rail stations, passenger vessel terminals, or airports;

4. End stations, unless they are close to another accessible station; and

5. Stations serving major activity centers, such as employment areas, government centers, higher education facilities, hospitals or other major health care centers, or other facilities that generate significant numbers of trips by individuals with disabilities.

2.4.1 KEY STATION DESIGNATION CRITERIA

The criteria for designating key stations are not mandatory, but the following discussion of each criterion may help determine which stations should be key stations.

2.4.1.1 Passenaer Boarding

Stations at which passenger boarding exceeds average station boarding experience the highest traffic levels and are most likely to experience the highest boarding levels of people with disabilities. The 15% figure is a useful guideline to distinguish among stations that experience higher boarding levels. Not all stations with higher than average boarding levels need to be key stations, but the stations which experience levels higher than 15 percent should be considered for designation as key stations.

On the other hand, if no stations have passenger boarding that exceeds the average by at least 15%, that does not mean that no stations are key stations on this basis. Those stations at which boarding exceeds the system average may still be centers of heavy ridership and could be considered for designation as key stations.

2.4.1.2 Transfer Stations

Transfer stations have heavier than **average traffic since traffic** comes from each of the routes that enter the station. An advantage of designating a transfer station as a key station and altering it for accessibility is that a single key station serves each of the routes served by the station.

2.4.1.3 Maior Interchanae Points

Major interchange points between different transportation modes should also be considered for designation as key stations. These areas that bring together people from other cities include airports, bus

terminals, intercity rail stations, or vessel terminals. Interchange points make the entire city accessible to individuals with disabilities. If any of these areas are not accessible, certain groups of people cannot even enter the city.

Key stations can be considered at places where the system interchanges with those modes that expand transit service to large segments of the population. Individuals who are located in an area served by only one mode use the interchange points to transfer to another mode. For example, those from a remote part of the area served only by bus would transfer from the bus to another mode, such as the subway, which would rapidly take them to other parts of the area.

2.4.1.4 End Stations

End stations should be designated as key stations because they attract large numbers of people from a range of areas that may not otherwise be close to the route. Not all end stations need to be designated as key stations, but they should be carefully considered in relation to the structure of the rail route. Sometimes the route is such that, although the end station is the end of the line, other stations effectively reach into distant service areas. If other key stations service the same areas as the end station, perhaps the end station need not be an accessible station, particularly if it also experiences low ridership.

2.4.1.5 Major Activity Centers

Certain locations draw large numbers of people for employment, for example, corporate parks and research parks; government centers, including military bases and other government employment centers; and colleges and universities. These centers would also draw large numbers of people with disabilities. Making the transit facilities accessible would be important for people who travel to such places for the opportunities they offer, particularly as a result of expanding accessibility.

In addition, places such as hospitals, rehabilitation centers, and other health care facilities attract people with disabilities by their very nature. The locations of such centers should guide the designation of key stations.

2.4.2 KEY STATIONS AND COMPLEMENTARY PARATRANSIT SERVICE

Even when stations and fixed routes are accessible, some people will still require paratransit service. However, increasing the accessibility of the system does reduce the need for paratransit service and increase the ridership on the accessible system.

Selecting which stations to make accessible has two perspectives. From one point of view, core areas where paratransit service areas overlap may have a higher concentration of people with disabilities. Increasing accessibility in those areas may reduce the number of ADA paratransit eligible individuals and allow more people to ride on the fixed-route system.

From the other point of view, efforts would focus on the more remote areas of the systems, such as end stations, bus terminals, or isolated areas. If the facilities are not made accessible at those locations, the paratransit service may need to bring eligible passengers a significant distance to an accessible station. The paratransit service may even bring passengers directly to their destinations, so that they do not use fixed-route transit at all. Increasing the accessibility of the facilities in these areas may increase the ridership of people whose disabilities have previously prevented them from using the fixed-route service.

These types of decisions should reflect the nature of the service area and the people with disabilities. The important aspect is to learn about these passengers and their transportation needs during the planning process.

Although these criteria are useful, they are not mandatory when selecting which stations to designate as key stations. For example, even if a station meets all five criteria, it does not have to be designated as a key station. Conversely, if the station does not meet any of the criteria, it may still be designated as a key station. The designation of key stations is determined through the planning and public participation process and is based on local factors.

2.4.3 PLANS FOR KEY STATION ACCESSIBILITY

A plan for the accessibility changes to key stations must be developed and submitted to the regional FTA office. The plans are due at the regional office by July 26, 1992 (CFR 37.47).

Prior to preparing and submitting the plan for the key stations, transit systems must consult people with disabilities and hold at least one public hearing regarding the plan. The plan must include documentation of this public participation, comments received during the process, and the transit system responses to those comments (CFR **37.471.**

The plan must also include milestones regarding the implementation of changes for accessibility at key stations (CFR 37.47). Table 2-l shows the due dates for various accessibility changes to light and rapid rail systems.

TABLE 2-1. TIMETABLE FOR LIGHT AND RAPID RAIL SYSTEMS

Transit Type	Accessibility Change	Date
Light and rapid rail	Vehicle acquisition	After August 25, 1990
	New construction and alterations	Work started after Januarv 26, **1992**
	Key station plan	Due July 26, 1992
	Key stations	Accessible by July **26, 1993**
	One car per train	Accessible by July **26, 1995**

2.4.4 DEADLINE EXTENSIONS

A transit system may submit a request for an extension of the July 26, 1993 deadline to the regional FTA office. However, extensions will be granted only for key stations requiring extraordinarily expensive structural changes (CFR 37.47). Extensions will be granted for a period up to July 26, 2020, but two-thirds of the key stations must be made accessible by July 26, 2010.

2.5 KEY STATIONS IN COMMUTER AND INTERCITY RAIL SYSTEMS

In addition to the requirements that stations be made accessible whenever alterations are undertaken, key stations will have to be made accessible by July 26, 1993. Rail systems must consult individuals with disabilities and conduct public hearings to determine key stations.

2.5.1 COMMUTER RAIL STATIONS

The criteria used to designate key stations for commuter rail systems should be the same as the criteria used to designate key stations in light and rapid rail systems.

2.5.1 .1 Plans for Key Station Accessibility

The rail systems must develop a plan for making key stations accessible and submit it to the regional FTA office. The plans are due at the regional office by July 26, 1992 (CFR 37.51).

Prior to preparing and submitting the plan for the key stations, rail systems must consult individuals with disabilities and hold at least one public hearing regarding the plan. The plan must include documentation of this public participation, comments received during the process, and rail system responses to those comments (CFR 37.57).

The plan must also include milestones regarding the implementation of changes for accessibility at key stations (CFR 37.57). Table 2-2 shows the due dates for various accessibility changes to commuter rail systems.

Table 2-2. TIMETABLE FOR COMMUTER RAIL SYSTEMS

Transit Type	Accessibility Change	Date
Commuter rail	Vehicle acquisition	After August 25, **1990**
	New construction and alterations	Work started after October 7, **1991**
	Key station plan	Due July 26, 1992
	Key stations	Accessible by July 26, 1993
	One car per train	Accessible by July 26, 1995

2.5.1.2 **Deadline Extensions**

A request for an extension of the July 26, 1993 deadline may be submitted to the regional FTA office. However, extensions 'will be granted only for key stations requiring extraordinarily expensive structural changes (CFR 37.57). Extensions will be granted for a period up to July 26, 2010 (not July 26, 2020, as for rapid and light rail).

2.5.2 INTERCITY RAIL STATIONS

All Amtrak rail stations must be made accessible as soon as possible, but no later than July 26, 2010.

2.5.3 DESIGNATION OF RESPONSIBILITY

Some stations are owned by more than one entity and used by more than one transit provider. The transit provider is not always an owner of the facility. Therefore, the distribution of responsibility for making the station accessible must be determined. Those responsible for the station will bear the legal and financial responsibility for making the station accessible, according to the applicable proportions (CFR 37.49).

If a public entity owns more than 50 percentof the ‘station, the public entity is wholly responsible for making the station accessible (CFR 37.49).

If a private entity owns more than 50 percent of the station, those who provide commuter or intercity rail service to the station are responsible for making the station accessible. If more than one entity provides commuter or i.ntercity rail service, each is responsible for the accessibility of the station in proportion to the percentage of passenger boarding attributable to’the service of each (CFR 37.49).

If no entity owns more than 50% of the station, the responsibility is divided so that half is the responsibility of the owner and half is the responsibility of those who provide commuter or intercity rail service to the station. If a station has more than one owner, the owners’ half of the responsibility is divided according to the proportion of ownership of each. If more than one entity provides commuter or intercity rail service, each is responsible in proportion to the percentage of passenger boarding attributable to the service of each (CFR 37.49).

However, those who must share responsibility for making a station accessible are permitted to divide the responsibility differently by agreement (CFR 37.49).

Table 2-3 shows the designation of responsibility.

TABLE 2-3. DESIGNATION OF RESPONSIBILITY

Ownership	Responsibility	Proportion of Responsibility
More than 50% by public entity	Public entity	100%
More than 50% by private entity	Those providing commuter or intercity rail service to the station	In proportion to the percentage of passenger boarding attributable to the service of each
Less than 50% by any owner	50% to owners	In proportion to ownership
	50% to providers of commuter or intercity rail service	In proportion to the percentage of passenger boarding attributable to the service of each
Responsibility may be allocated differently by agreement.		

2.6' TRANSPORTATION FACILITY GUIDELINES AND OTHER ADA TRANSIT GUIDELINES

This section describes the guidelines for transportation facilities and other ADA transit systems.

2.6.1 VEHICLE ACQUISITION

The requirements discussed here for the acquisition of accessible vehicles apply only to public entities. Specific requirements exist for the following types of vehicle acquisitions:

1.	Nonrail Vehicles:
+	Purchase or lease of new vehicles by public entities operating fixed-route systems (CFR 37.71),
+	Purchase or lease of used vehicles by public entities operating fixed-route systems (CFR 37.73),
+	Remanufacture of vehicles and purchase or lease of remanufactured vehicles by public entities operating fixed-route systems (CFR 37.75), and
+	Purchase or lease by public entities operating a demand-responsive system for the general public (CFR 37.77);
2.	Rapid or Light Rail:
+	Purchase or lease of new rail vehicles by public entities (CFR 37.791,
+	Purchase or lease of used rail vehicles by public entities (CFR 37.81), and
+	Remanufacture of rail vehicles and purchase or lease of remanufactured rail vehicles by public entities (CFR 37.83);
3.	Intercity and Commuter Rail:
+	Purchase or lease of new railcars (CFR 37.85),
+	Purchase or lease of used railcars (CFR 37.87), and
+	Remanufacture of railcars and purchase or lease of remanufactured railcars to the maximum extent feasible (CFR 37.89).

2.6.1.1 Basic Requirements

From now on (and since August 25, 1900), for any of the solicitations just cited (except the remanufacture. of intercity and commuter railcars), the vehicles must be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs.

2.6.1.2 Nonrail Vehicles for Fixed-Route Svstems

Since all nonrail vehicles (for fixed-route service) purchased or remanufactured after August 25, 1990 must be accessible (CFR 37.71, 37.73, 37.751, the implications of making the route itself accessible should be considered. New vehicles will have lifts, and it makes sense to be able to deploy the lifts at as many stops as possible.

The regulations require that all new bus stop pads be accessible ***(49 CFR 37: Section 10.2.1 of Appendix A).*** They do not require, however, that bus stop pads be installed at every site. If they are installed, they must meet accessibility standards. As new buses with lifts are purchased and put into service, systems should assure that as many of the stops as possible are accessible.

Similarly, new or replacement bus shelters must be designed to be accessible (49 ***CFR 37: Section 10.2.7 of Appendix A).***

Installing accessible bus stop pads means that as many passengers as possible can use the accessible vehicles that are purchased. Doing otherwise would not make sense. No systems would want to run the accessible buses and not be able to provide service to passengers with disabilities because the bus stops were not accessible or the lifts could not be deployed at all stops.

2.6.1.3 Rail Vehicles for Rapid or Liaht Rail Svstems

All new rapid or light rail vehicles solicited for acquisition after August 25, 1990 must be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs ***(CFR 37.79).***

In addition, each train consisting of two or more vehicles must have at least one accessible car, as soon as practicable, but not later than July 26, 1995 ***(CFR 37.93).***

New station construction undertaken after Januarv 26, 1992 must result in fully accessible facilities, including an accessible path of travel, signs, a detectable warning device at platform edges, and an accessible public address system ***(49 CFR 37: Section 10.3.1 of Appendix A).***

New vehicles and existing station platforms must be coordinated so that the vertical gap between them is 1.5 inches or less and the horizontal gap is 3 inches or less at one door. New vehicles in new stations must have a vertical displacement of 5/8 inch or less (49 ***CFR 37: Section 10.3.2 of Appendix A).***

An exception is made for retrofitted vehicles, so that the vertical gap can be 2 inches or less and the horizontal gap can be 4 inches or less ***(49 CFR 37: Section 10.3.2 of Appendix A).***

Key stations must be made accessible by January 26, 1993. Without careful planning, some key stations may be accessible, but no accessible railcars may be available to run through them. Then again, the opposite situation may occur: new, accessible cars may have been delivered, but all the key stations may not have been made accessible. Moreover, until all stations have been made accessible through the completion of alterations and new construction, trains with an accessible car may be stopping at stations that are not accessible, so people with disabilities cannot use them.

During accessibility changes, including new construction, alterations to existing stations, remanufacturing of existing vehicles, and the purchase of new vehicles, transit systems should examine how accessible other aspects of the service are because a change in one may show the need for a change in another.

For example, as systems purchase new vehicles and remanufacture old ones, they will want to operate them on routes that connect at completed key stations. As the completion date for key station accessibility approaches, systems will want to have as many accessible vehicles as possible on the routes, even though the requirement for one accessible car per train is not due for completion

until 2 years later. Systems will want to schedule as many accessible runs as possible on a line with accessible key stations so that as many people with disabilities as possible will **be** able to use the service.

Both the rail system, which will be acquiring vehicles and adapting stations, and individuals with disabilities will gain from assuring that accessible vehicles run on accessible routes and that accessible routes are serviced by accessible vehicles.

2.6.1.4 Intercity and Commuter Railcars

Intercity or commuter railcars solicited for acquisition after August 25, 1990 must be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs ***(CFR 37.85).***

In addition, each intercity or commuter train must have at least one accessible car, as soon as practicable, but no later than July 26, ***1995 (CFR 37.93).***

New station construction undertaken after October 7, 1991 must entail fully accessible facilities, including an accessible path of travel, signs, a detectable warning device at platform edges, and an accessible public address system ***(49 CFR 37: Section 10.3.1 of Appendix A).***

The vehicles and existing station platforms must be coordinated so that the vertical gap between them is 1 1/2 inches or less and the horizontal gap is 3 inches or less ***(49 CFR 37: Section 10.3.2 of Appendix A).*** New vehicles in new stations must have a vertical displacement of 5/8 inches or less.

An exception is made for retrofitted vehicles, so that the vertical gap can be 2 inches or less and the horizontal gap can be 4 inches or less (49 ***CFR 37: Section 10.3.2 of Appendix A).*** Where it is structurally or operationally infeasible to meet these requirements, lifts, ramps, bridge plates, or mini-high platforms can be used.

Key stations of commuter rail lines must be made accessible by January 26, 1993. All Amtrak stations must be made accessible by July 26, 2010. Without careful planning, some key stations may be accessible, but no accessible railcars may be available to run through them. Then again, the opposite situation may occur: new, accessible

cars may have been delivered, but all the key stations may not have been made accessible; or trains with an accessible car may be stopping at stations that are not accessible.

During accessibility changes, including new construction, alterations to existing stations, remanufacturing of existing vehicles, and the purchase of new vehicles, transit systems should examine how accessible other aspects of the service are because a change in one may show the need for a change in another.

2.6.2 VEHICLE SPECIFICATIONS AND FACILITY ACCESSIBILITY

Vehicle specifications will affect facility design and vice versa.

2.6.2.1 Buses, Vans, and Systems

One vehicle specification requirement will have an impact on the design of accessible facilities for buses and vans: the requirement for mobility aid accessibility ***(CFR38.23).*** All buses and vans, in accordance with the regulations for vehicle acquisition dates, must be equipped with a level-change mechanism or boarding device, such as a lift or ramp ***(CFR 38.23).***

A final consideration is the type of lift installed on vehicles that will be using the accessible bus stops. The amount of vertical and horizontal movement of the lift at every height must be considered at each accessible bus stop. Although the required dimensions for the clear platform space will accommodate many lifts and allow their operation, all the particular lifts installed on vehicles must be checked. A lift may move outside the specified dimensions in its normal operation, and must be checked to determine that it cannot be obstructed at the accessible bus stops.

2.6.2.2 Rapid Rail Vehicles and Systems

Three sections of the Final Rule on vehicle specifications for rapid rail vehicles may have an impact on facilities:

1. Doorways ***(CFR 38.53);***
2. Public information systems ***(CFR*** 38.67); and
3. Between-car barriers ***(CFR 38.63).***

Doorways-Rapid Rail Vehicles

Passenger doorways on rapid rail vehicles must have a clear **opening** at least 32 inches in width ***(CFR*** 38.53). The accessible **stations** must be able to accommodate this width at the platform.

In addition, the position of the doorways must conform with that of the boarding platform. When new vehicles operate in new stations, the maximum allowable horizontal gap between the vehicle floor and the station platform is 3 inches, and the maximum allowable vertical gap is 5/8 inch ***(CFR 38.53).***

For new vehicles operating in existina stations, the vertical gap for at least one doorway of a new vehicle must be 1% inches or less. At key stations, the horizontal gap must be 3 inches or less ***(CFR 38.53).***

For retrofitted vehicles in new and kev stations, the horizontal gap must be 4 inches or less and the vertical gap must be 2 inches or less *(**CFR 38.53).***

Systems will need to coordinate alterations and new construction with the purchase and retrofitting of vehicles in order to meet these gap specifications. Although a vehicle doorway will be the same height from the track at different stations, the platforms may vary in height. The platforms must meet the vehicle doorways within the tolerances given in the specifications.

Systems will also need to coordinate the purchase of new vehicles and the retrofitting of old vehicles with the structure of existing stations, particularly the key stations.

Public Information Systems-Rapid Rail Vehicles

Each vehicle operating in stations with more than one line or route needs an external public address system to permit announcements regarding train, route, or line identification ***(CFR*** 38.67). The exception is when the station announcement system provides information on arriving trains.

Transit systems will find it useful to compare having an announcement system at each station or having one installed on each accessible train. A single system at each station may be more cost-effective than multiple systems on each train. Many stations may already have public information systems that announce incoming and departing trains.

Between-Car Barriers-Rapid Rail Vehicles

Trains must have a safety device between railcars to prevent individuals from inadvertently stepping off the platform between the cars and falling onto the tracks ***(CFR 38.63).*** The regulations address solutions that are mounted on the trains, such as pantograph gates, chains, or motion detectors.

Station platforms are an exception if they have screens that close off the platform edge and open only when trains are correctly aligned with the doors.

If a station has this type of screen, the trains that run through it do not need to have a between-car barrier. On the other hand, if the trains run through other stations that are not constructed with the screen, the between-car barrier would be necessary.

2.6.2.3 Light Rail Vehicles and Systems

For light rail vehicles, two sections of the vehicle specification Rule may impact the type of accessibility features to be installed at stations:

1. Doorways ***(CFR 38.73);*** and
2. Mobility aid accessibility ***(CFR 38.83).***

Doorways-Light Rail Vehicles

Passenger doorways on light rail vehicles must have a clear opening at least 32 inches in width ***(CFR*** 38.73). The accessible stations must be able to accommodate this width at the platform. Stations cannot be designed to board persons with disabilities at a different stopping position than for boarding the general public.

In addition, the position of the doorways must conform with that of the boarding platform. When new vehicles operate in **new** stations, the maximum allowable horizontal gap between the vehicle floor and the station platform is 3 inches and the maximum allowable vertical gap is 5/8 inch ***(CFR 38.73).***

For new vehicles operating in existing stations, the vertical gap for at least one doorway of a new vehicle must be less than 1% inches. At key stations, the horizontal gap must be less than 3 inches ***(CFR 38.73).***

For retrofitted vehicles in new and key stations, the horizontal gap must be less than 4 inches and the vertical gap must be less than 2 inches ***(CFR 38.73).***

When it is not operationally or structurally possible to meet the specifications for horizontal or vertical gaps, devices that meet the specifications for ramps and lifts may be installed on the vehicles or platforms ***(CFR 38.73).*** Another alternative is to install platform- or vehicle-mounted ramps or bridge plates that meet the specifications for such devices ***(CFR 38.53).***

Alterations and new construction must be coordinated vvith the purchasing and remanufacturing of vehicles so that these gap specifications can be met. Stations and platforms at key stations and at other altered stations may require changes to be at the proper height for new and remanufactured vehicles.

The reverse is also true because stations may have to accommodate **a** variety of vehicles with doorways at different heights, as new vehicles are purchased, old vehicles continue to be used, and the remanufacturing of vehicles is not yet completed.

If the platform heights cannot conform with the doorway height of all the vehicles that will be stopping at them, other devices such as lifts, ramps, or bridge plates at the platform may have to be installed. The decision about whether to install such devices on the vehicles or on a platform will depend on whether the vehicles meet the gap requirements at other platforms. If the vehicles are of the proper height and distance when they are at other platforms, the problem is more with the platform than the vehicle, and the preferred solution may be to install a device at certain stations.

Mobility Aid Accessibility-Light Rail Vehicles

If new light rail vehicles do not meet the vertical and horizontal gap requirements just described, they will need to be equipped with a level-change mechanism or boarding device, such as a lift or ramp ***(CFR 38.83).***

The accessible stations will need a clear space for the lift to be deployed. The platform space requirements for deploying the lift for light rail vehicles are the same as the requirements for clear spaces at bus stops. **Section 2.6.2.1, Buses, Vans, and** Systems, describes these requirements.

2.6.2.4 Commuter Railcars and Systems

For commuter railcars and systems, two sections of the vehicle regulations may impact the design of facilities for accessibility:

1. Doorways (CFR 38.93); and
2. Mobility aid accessibility (CFR 38.95).

Doorways-Commuter Railcars

At least one door on each side of commuter rail vehicles must have a clear opening at least 32 inches wide (CFR 38.93). The accessible stations must be able to accommodate this width at the platform, at the same stopping location used by the general public.

The position of doorways on commuter rail vehicles operating in stations with high platforms or mini-high platforms must conform with the position of the boarding platform. **Doorways-Rapid Rail Vehicles in Section 2.6.2.2, Rapid Rail Vehicles and Systems,** describes the specifications for the horizontal and vertical gaps between the vehicles and the platform for commuter railcars.

Mobility Aid Accessibility-Commuter Railcars

If new commuter rail vehicles do not meet the vertical and horizontal gap requirements just described, they must be equipped with a level-change mechanism or boarding device, such as a lift or ramp (CFR 38.95).

All accessible stations will need a clear space for the lift to be deployed. The platform space requirements for deploying the lift for commuter railcars are the same as the requirements for clear spaces at bus stops. **Section 2.6.2.1, Buses, Vans, and Systems, describes these** requirements.

2.6.2.5 Intercity Railcars and Systems

For intercity (Amtrak) railcars and systems, two sections of the regulations may impact the design of facilities for accessibility:

1. Doorways (CFR 38.7 73); and
2. Mobility aid accessibility (CFR 38.725).

Doorways -Amtrak Railcars

At least one door on each side of Amtrak rail vehicles must have a clear opening at least 32 inches wide (CFR 38.7 73). The accessible stations must be able to accommodate this width at the platform, at the same stopping location used by the general public.

The position of doorways on Amtrak rail vehicles operating in stations with high platforms or mini-high platforms must conform with the position of doorways on the boarding platform. **Doorways-Rapid Rail Vehicles** in **Section 2.6.2.2, Rapid Rail Vehicles and Systems,** describes the specifications for the horizontal and vertical gaps between the vehicles and the platform for Amtrak railcars.

Mobility Aid Accessibility-Amtrak Railcars

If new Amtrak rail vehicles do not meet the vertical and horizontal gap requirements just described, they must be equipped with a level-change mechanism or boarding device, such as a lift or ramp (CFR 38. 725).

All accessible stations will need a clear space for the lift to be deployed. The platform space requirements for deploying the lift for Amtrak vehicles are the same as the requirements for clear spaces at bus stops. **Section 2.6.2.1, Buses, Vans, and Systems,** describes these requirements.

2.6.3 COMMERCIAL FACILITY GUIDELINES

Within a transportation facility, other facilities may also need to be accessible. The regulations include specific requirements for a number of facilities. The most relevant for transportation facilities are as follows:

+ restaurants and cafeterias (49 ***CFR 37: Sections 5.7 to 5.9 of Appendix A*** of the Department of Transportation Final Rule);

+ business and trade (49 ***CFR 37: Sections 7.1 to 7.4 of Appendix A);*** and

+ automated teller machines ***(49 CFR 37: Section 4.34 of Appendix A).***

2.6.3.1 Restaurants and Cafeterias

All restaurants and cafeterias located at transit stations must be fully accessible when new construction is undertaken or the facility is altered (49 ***CFR 37; Section 5.7 of Appendix A).*** If fixed tables are provided, 5% of them, and at least one, must be accessible. In addition to general requirements for accessibility, specific requirements for restaurants concern the following:

♦ counters and bars ***(49 CFR 37: Section 5.2 of Appendix A);***

♦ access aisles ***(49 CFR 37: Section 5.3 of Appendix A);***

♦ dining areas ***(49 CFR 37: Section 5.4 of Appendix A);***

♦ food service lines ***(49 CFR 37: Section 5.5 of Appendix A);***

♦ tableware and condiment areas ***(49 CFR 37: Section 5.6 of Appendix A);***

♦ raised platforms ***(49 CFR 37: Section 5.7 of Appendix A);*** and

♦ vending machines and other equipment ***(49 CFR 37: Section 5.8 of Appendix A).***

The transit system is responsible for the accessibility of any of these areas that it operates as well as areas that the system owns and leases to a private company.

An accessible path of travel must also be provided between accessible restaurants and cafeterias and other accessible areas of the station. The path may need to include such adaptations to the facility as accessible doorways, ramps, special floor surfaces, and other accessibility features.

2.6.3.2 Business and Trade

Facilities that are used for business transactions with the public must be made accessible when the facilities are altered or new construction is undertaken. Aside from the general specifications that apply to all facilities, the specific requirements for business areas are as follows:

+ sales and service counters, teller windows, and information counters ***(49 CFR 37: Section 7.2 of Appendix A);***

+ checkout aisles ***(49 CFR 37: Section 7.3 of Appendix A);*** and

+ security bollards ***(49 CFR 37: Section 7.4 of Appendix A),***

The transit system is responsible for the accessibility of any of these areas that it operates, as well as areas that the system owns and leases to a private company.

The responsibility to make facilities accessible is divided among owners and transit providers as outlined in Table 2-3.

The transit system will also need to provide an accessible path of travel between accessible business establishments and other accessible areas of the station. The path may need to include such adaptations to the facility as accessible doorways, ramps, special floor surfaces, and other features.

2.6.3.3 Automated Teller Machines

For automated teller machines, there must be a clear space in front of the machine ***(49 CFR 37: 4.34.3 of Appendix A).*** The clear space must be large enough to allow a person in a wheelchair to approach the machine in a parallel direction ***(49 CFR 37: Section 4.27.2 of Appendix A).*** The highest operable part must no higher than 48 inches from the ground and the lowest no lower than 15 inches from the ground.

Although a financial institution typically owns and operates automated teller machines, the transit system may need to change the design of the facility when alterations or new construction are undertaken. If the machine faces onto a part of the station, the transit system must provide sufficient clear space in front of the machine. Also, the transit system cannot do through a contract what it could not do itself. Therefore, it could not enter into an agreement with a financial institution to install inaccessible machines.

2.7 TIMETABLE FOR IMPLEMENTING CHANGES

Table 2-4 shows the different accessibility dates that apply to both facilities and vehicles. The dates for each facility do not coincide so that transit systems will gain flexibility in setting priorities. However, that flexibility could result in mismatches of vehicles and facilities that may or may not be accessible at a particular point in time.

TABLE 2-4. TIMETABLE FOR VEHICLE AND FACILITY ACCESSIBILITY

Transit Type	Accessibility Change	Date
Nonrail	Vehicle acquisition	After August 25, 1990
	New Construction and alterations	Work started after January 26, 1992
Light and rapid rail	Vehicle acquisition	After Aunust 25, 1990
	New construction and alterations	Work started after January 26, 1992
	Key station plan	Due July 26, 1992
	Key stations	Accessible by July 26, 1993
	One car per train	Accessible by July 26, 1995

Table 2-4. Timetable for Vehicle and Facility Accessibility (Continued)

Transit Type	Accessibility Change	Date
Commuter rail	Vehicle acquisition	After August 25, 1990
	New construction and alterations	Work started after October 7,199l
	Key station plan	Due July 26, 1992
	Key stations	Accessible by July 26, 1993
	One car per train	Accessible by July 26, 1995
Intercity rail	Vehicle acquisition	After August 25, 1990
	New construction and alterations	Work started after October 7, 1991
	One car per train	Accessible by July 26, 1995
	All facilities	Accessible by July 26, 2010

If a station is subject to different completion dates because, for example, it is served by different transportation modes, the earlier completion dates apply for the following elements of the station ***(CFR 37.59):***

1. Common elements of the station;
2. Portions directly serving the rail system with the earlier completion date; and
3. An accessible path from common elements to portions directly serving the system with the earlier completion date.

For example, if a key station is served by both commuter and intercity rail service, common elements of the station and any elements directly serving the rapid rail service must be made accessible by July 26, 1993. In addition, an accessible path is required from the common elements to the commuter rail areas by July 26, 1993. These changes are required even though they may involve changes to the intercity rail service areas that do not have to be accessible before July 26, 2010.

3. SITE AND ENTRANCE

This section presents requirements and recommendations for improving the visibility and accessibility of the station and its surroundings: the drop-off and parking areas, paths, entrance sites, and doors.

Topics in the first part include:

+ pedestrian paths;
+ drop-off areas;
+ parking; and
+ paths from other transit modes.

Topics in the second part include:

+ entrance sites;
+ door dimensions;
+ space around the entrance;
+ doors in series;
+ door hardware; and
+ door operation.

The appendix, **Facilities Accessibility Checklists,** lists required and recommended features for accessibility.

3.1 STATION VISIBILITY

For everyone's ease of use, a highly visible station is best. A building of a particular architectural style or design, or one that is noticeably different from surrounding buildings, is easier to find. Setting the building off from others with distinctive colors, designs, logos, or other features helps passengers locate the station and its entrance.

Signs are an important feature of station visibility and ease of access. Letter styles, sign appearance, and color choice should be unique to the transit system so that passengers can readily identify

stations. Easy-to-read lettering and distinctive signs help individuals with limited vision loss in their efforts to identify the facilities ***(ADA Accessibility Guidelines for Buildings and Facilities, 49 CFR 37: Section 4.30 of Appendix A of the Department of Transportation Final Rule).***

The specifications for sign size, words or symbols, and location are as follows:

1. Letters, numbers, and designs on signs should be sized according to viewing distance.

2. For overhead signs, the minimum height over a walkway is 80 inches and the minimum character height is 3 inches.

3. The background must contrast well with the letters and designs, either dark on light or light on dark.

4. The finish on signs must be matte or another nonglare finish.

5. Signs at ground level must have no obstructions in front so people can stand as close as 3 inches away to read them.

6. Some signs at ground level indicating accessible features must include the International Symbol of Accessibility and written information in raised, letters:
   a. Letters and numerals raised 1/32 inch and accompanied with Grade 2 Braille; and
   b. Raised characters at least 6/8 inch high, but not more than 2 inches high.

3.11 APPROACH ON A SIDEWALK

Passengers may arrive at a transit station by a variety of means: along a sidewalk, in a private vehicle, by drop-off from a car, in a van, feeder bus, or paratransit service; or from another transit mode or line.

The pathways leading to the station entrance need to be accessible from each of these approaches. Each pathway and approach is discussed in detail.

The pathway issues include:

+ walkways;
+ parking;
+ passenger drop-off area;
+ curb cuts;
+ ramps; and
+ surface materials and obstacles.

This section presents ways to examine existing or proposed stations and determine how passengers will get to them. Regardless of which means passengers use to get to the station, approaches have to be accessible and

+ minimize the distance to an accessible entrance;
+ lead to accessible entrances near the main flow of traffic; and
+ provide a safe pathway for passengers who use them.

Passengers approach the station from other areas of pedestrian traffic along sidewalks or other paths. They must be able to locate the station, identify the accessible entrances, move off the sidewalk onto the accessible path to the station, and move along the accessible path to the entrance.

3.1.1.1 Signs

Signs must display two types of information: the location of the entrance and the location of an accessible entrance.

Entrance Signs

Signs indicating the entrance to the facility will need to be visible and readable by a variety of passengers. The letters, numbers, and

designs on signs should be sized according to viewing distance. Individuals who are not in vehicles will want to see the signs as they approach the station. Their need determines the height of the entrance signs. A sign high on the building can be seen from a distance. A sign over the entrance can be seen by an approaching passenger.

In addition, signs marking the entrance must be placed at eye level. For all signs, the background must contrast well with the letters and designs, either dark on light or light on dark. The high contrast will help all passengers read the signs.

Often a reflection or glare can make signs difficult to read, so the finish on signs must be matte or another nonglare finish.

Signs at ground level should have no obstructions in front of them so that people can stand as close as 3 inches away to read them. Often individuals with vision impairment can read printing if they are close to it.

Accessible Entrance Signs

Each accessible entrance must have a sign indicating that it is accessible. In addition, all entrances that are not accessible must have a sign indicating the direction to an accessible entrance.

The boxed list immediately preceding **Section 3.1.1, Approach on a Sidewalk,** presents detailed suggestions about the lettering, size, and placement of signs. Figure 3-l shows the International Symbol of Accessibility.

Before the path to the accessible door becomes impassable, a sign mounted to the right of the path should indicate the location of an accessible entrance and meet the sign specifications just described. The signs should be placed at turns and other points along the path to prevent people from traveling in the wrong direction.

Figure 3-1. International Symbol of Accessibility

3.1.1.2 Placement of Sians

One for Each Entrance

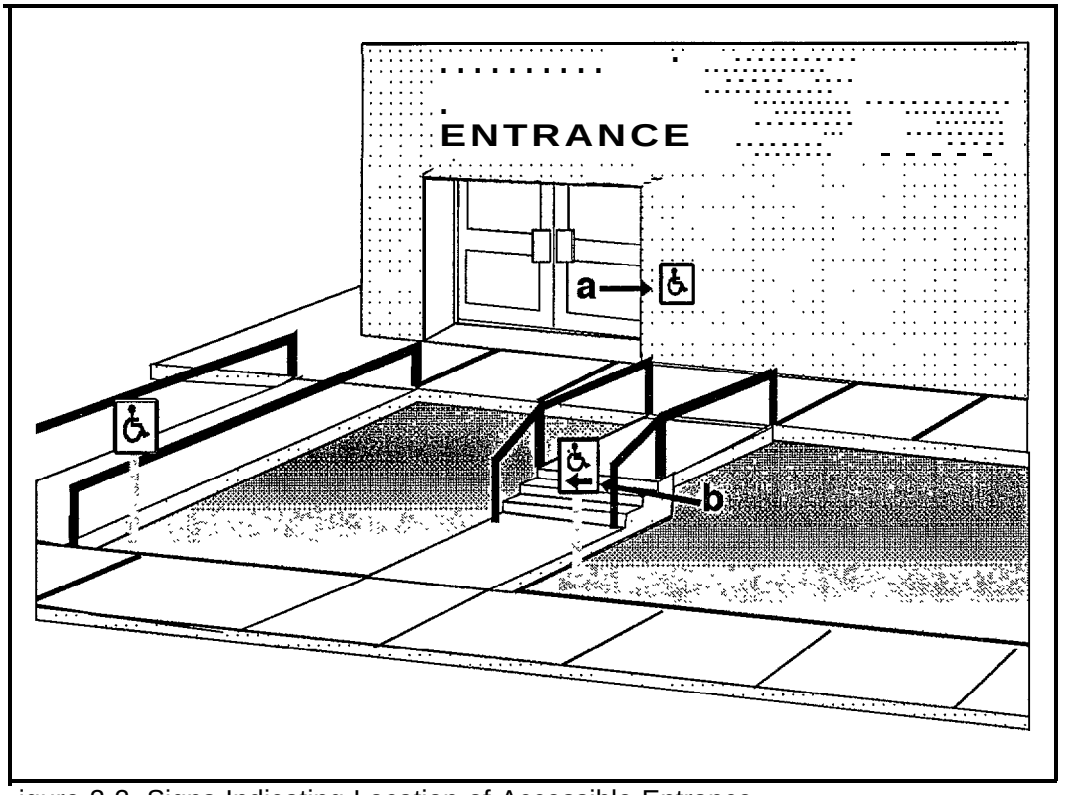
A sign showing the accessible symbol should appear at all accessible entrances (see Figure 3-2, pointer a). In addition, each entrance should feature a sign with the symbol and directions to the nearest accessible entrance to emphasize the accessibility of the facility and help passengers find their way.

Signs along the Pathway

A sign showing the directions to the nearest accessible entrance should be placed at each point where the path becomes impassable. The sign should indicate the direction of the path to the accessible

entrance (see Figure 3-2, pointer b). In addition, whenever a passenger comes to a point where a path splits, a sign must point out the accessible path. It is generally a good idea to place signs wherever they might clarify directions.

A less accessible facility needs more signs to point passengers in the right direction. As the facility becomes more accessible, it will need fewer signs.



igure 3-2. Signs Indicating Location of Accessible Entrance

3.1 .1.3 Location of Accessible Entrance

In order to provide equal access to people with disabilities, the accessible entrance should be just as much a part of the main flow of pedestrian traffic as any other entrance. Locating the accessible entrance near the main flow of traffic will minimize the distance the

passenger needs to travel to the entrance and may also minimize changes **or** adaptations needed along the accessible pathway.

3.1.1.4 Accessible Pathway

A pedestrian approaching the station will require accessibility in each of the following maneuvers:

+ from the sidewalk to the path to the accessible entrance;
+ along the path;
+ over or across obstacles;
+ over curbs; and
+ up or down ramps.

Surface

The surface of the accessible pathway should be free of bumps, but have a texture that provides traction. Changes in level up to 1/4 inch may remain vertical. Changes in level between 1/4 inch and1/2 inch high must be beveled to a slope of no more than 1:2 Changes in level greater than 1/2 inch require a ramp ***(49 CFR37; Section 4.5.2 of Appendix A).*** Figure 3-3 shows guidelines for level changes.

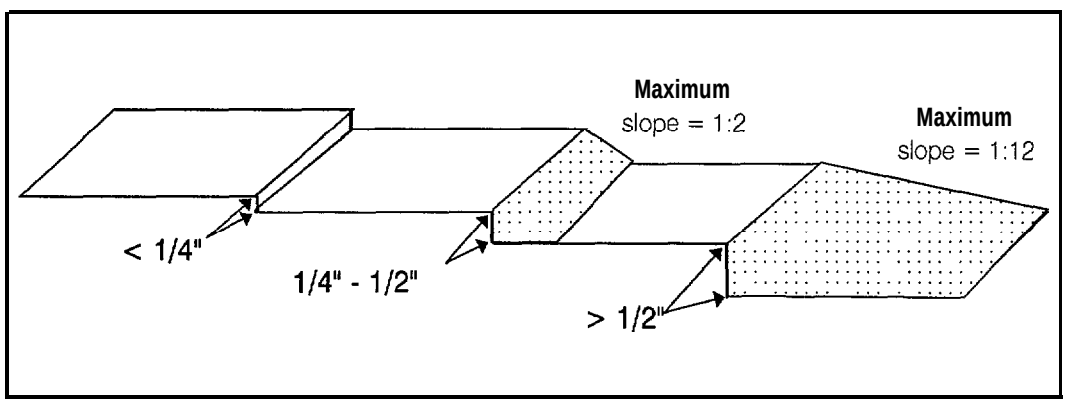


Figure 3-3. Accessible Pathway Surface Levels

Paving Materials. Small vertical changes in level can stop a wheelchair unexpectedly or trip a person. Paving materials such as bricks or

concrete blocks often have irregularities exceeding 1/4 inch and thus should be avoided for accessible pathways. Even if they are laid to 1/4-inch tolerances, the bumping from rolling on jointed materials can be uncomfortable for people in wheelchairs.

Surface Texture. Slip-resistant surfaces must be the choice for accessible paths. The surfaces should remain slip-resistant in both wet and dry conditions and should not require more than normal housekeeping to retain slip-resistance. Slip-resistance is an important factor in the choice of flooring materials. Glazed tile or marble would be unwise choices, but unglazed textured tile or broom-finished concrete would be acceptable.

Grates

Grates should be avoided on accessible paths. If they cannot be avoided, their openings must be no greater than 1/2 inch wide in one direction. If the openings are longer in the other direction, the long direction must be perpendicular to the flow of traffic (49 CFR 37: ***Section 4.5.4 of Appendix A).*** Small casters on the front of wheelchairs, for example, can easily slip into openings more than 1/2 inch long and stop the wheelchair abruptly.

Path of Sufficient Width

In general, the minimum allowable width of an accessible oath is 36 inches. At points along the path where a permanent object juts into the path (e.g., column, drinking fountain), the minimum width shall be 32 inches. This minimum width is not sufficient for traveling side by side ***(49 CFR 37: Section 4.2. 7 of Appendix A).***

A 48-inch path is wide enough for a person in a wheelchair and a person on foot to travel side by side. This width also allows a person on foot to pass the person in the wheelchair.

A path width of 60 inches allows two-way traffic of individuals in wheelchairs and lets a person in a wheelchair pass another wheelchair. Figure 3-4 shows pathway width guidelines.

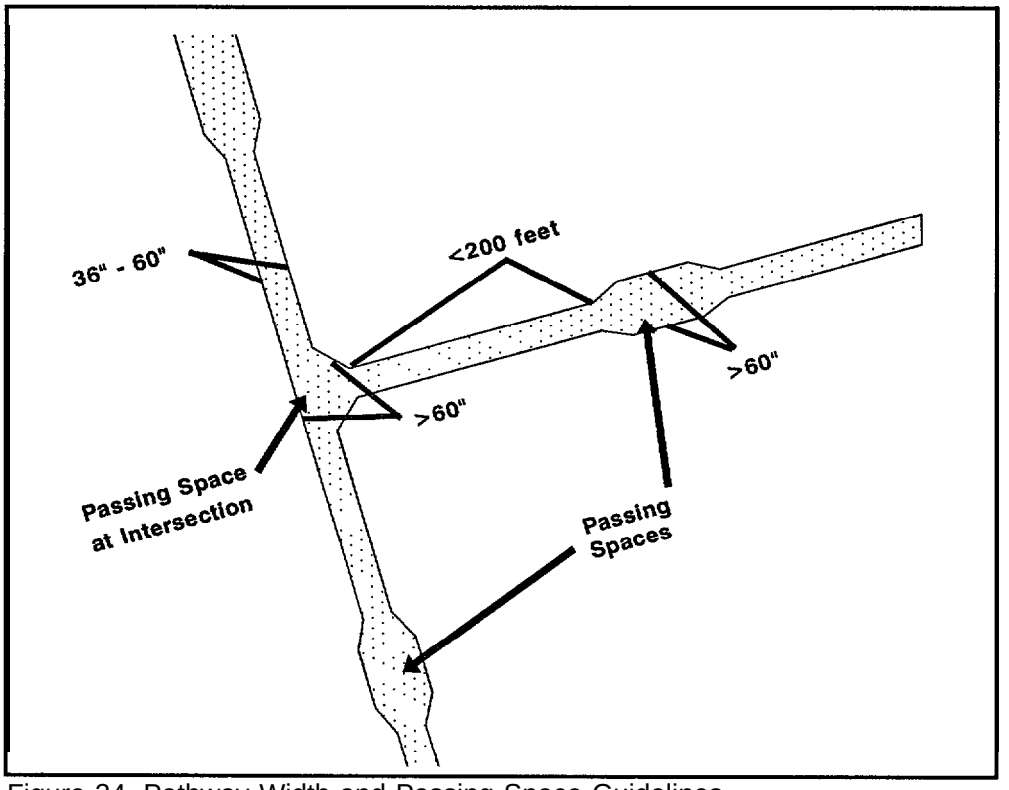


Figure 34. Pathway Width and Passing Space Guidelines

Passing Spaces

A pathway that is less than 60 inches across must include passing spaces at regular intervals. The passing spaces must be at least 60 inches wide and occur at least every ***200*** feet (49 ***CFR 37: Section 4.3.4 of Appendix A).*** As an example, an intersection of two paths that widens to 60 inches is **a** good way to provide a passing space. Figure 3-4 shows the guidelines for passing spaces.

Lighting

Good lighting in and around transportation facilities is helpful for all passengers and is especially critical for persons with limited vision. Lighting along accessible paths must be relatively uniform. The

arrangement of lights should minimize areas of shadows. Lighting near signs must also be relatively uniform and minimize glare on the signs (49 ***CFR 37: Section 70.3. 7 of Appendix A).***

The regulations do not require a minimum level of lighting or a specific lighting configuration. Fluorescent ceiling lights with proper diffuser panels provide uniform illumination. By contrast, recessed ceiling lights provide uneven illumination and should not be the only lighting source.

Pathway Clear of Obstacles

The accessible path to the entrance must never contain obstacles that would impede a wheelchair. Such obstacles include:

+ Curbs;

+ Steps;

+ Changes in level of more than 1/4 inch;

+ Poles or other fixtures that narrow the path;

+ Objects that protrude from walls and narrow the path:
  - telephone booths,
  - water fountains,
  - signs or maps,
  - schedules or other information in display racks;

+ Objects that stand in the path, and narrow it:
  - trash containers,
  - potted plants or other decorative items,
  - advertising displays,
  - newspaper dispensers,
  - cash boxes or parking meters;

+ Ticket vending machines; and

+ Surfaces that are difficult to travel on, such as gravel, stones, or sand.

If any of these obstacles or others occur along the accessible path, they must be moved, changed, or improved to maintain accessibility.

Curbs **will need curb cuts. Steps must have ramps nearby.** Smaller changes in level must be equipped with ramps or beveled. Uneven surfaces must be improved. These alterations may mean moving or redesigning objects if they infringe on the accessibility of the path.

3.1.1.5 Curb Cuts

The maximum allowable slope for a curb cut is 1: 12, or a length of 12 inches of horizontal surface for every inch of vertical rise. The surface of the curb cut must be firm and stable, as well as slip-resistant. In addition, curb ramps must have a detectable warning. The curb surfaces are designed to warn anyone who steps on them or taps them with a cane. In this case, the hazard is both the slope of the curb cut and the proximity of motor vehicle traffic.

A detectable warning:

1. Is raised truncated domes:
   - **diameter of 0.9 inch (23 mm),**
   - height of 0.2 inch (5 mm),
   - center-to-center spacing of 2.35 inches (60 mm) along vertical and horizontal axes, staggered rows;

2. Contrasts with surrounding surface, either dark on light or light on dark, and the material providing contrast is an integral part of the surface; and

3. Covers the entire width and depth of the curb ramp, exclusive of flared sides.

Figure 3-5 shows a detectable warning surface on a curb cut.

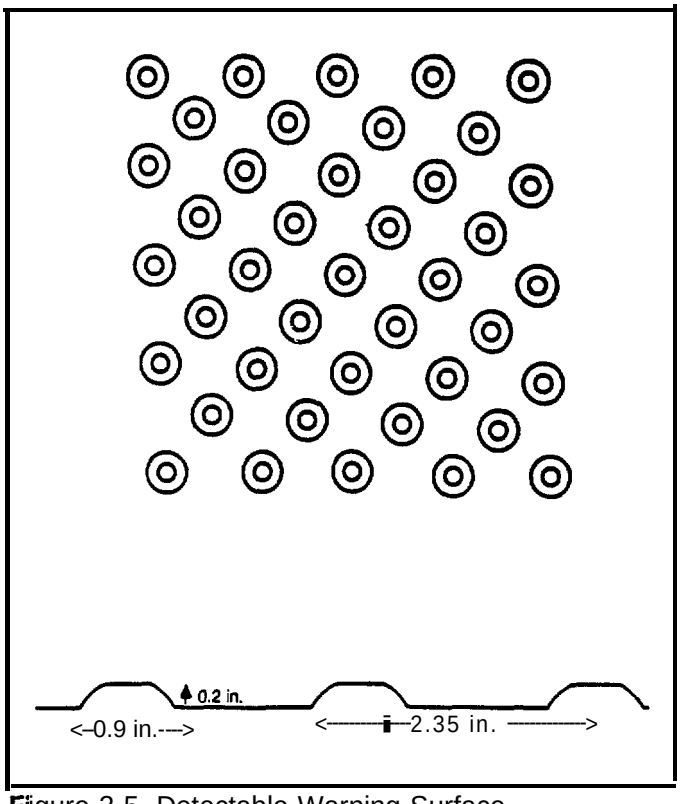


Figure 3-5. Detectable Warning Surface

Placement of Curb Cuts

Installing curb cuts involves a number of considerations. Two are the use of good sense and a concern for the safety of all individuals.

Various other aspects of curb cut placement are as follows:

1. Curb cuts that enter a street need a crosswalk to alert drivers of the crossing traffic.

2. The entire surface of the curb cut ramp must be included in the crosswalk area, no matter where the curb cut is placed in relation to the corner.

3. Curb cut placement includes attention to the place in the street where the ramp will lead the passenger. If the curb cut is at an angle, a person in a wheelchair may roll to a place that a motorist would not anticipate.

4. A sidewalk may be too narrow if a curb cut is placed perpendicular into the side. Placing the curb cut nearer the corner should provide more space.

5. Curb cuts should be away from the normal route of a visually impaired person. People who are visually impaired usually walk on the sidewalk away from the street, next to the buildings or grassy area. The curb is a cue to alert them that they are entering the street.

6. If the sidewalk has no curbs, a detectable warning must be installed so that people with visual impairments know that they are entering the street.

Figure 3-6 shows these features in curb cut placement. The numbers in the preceding list match the numbers in the figure.

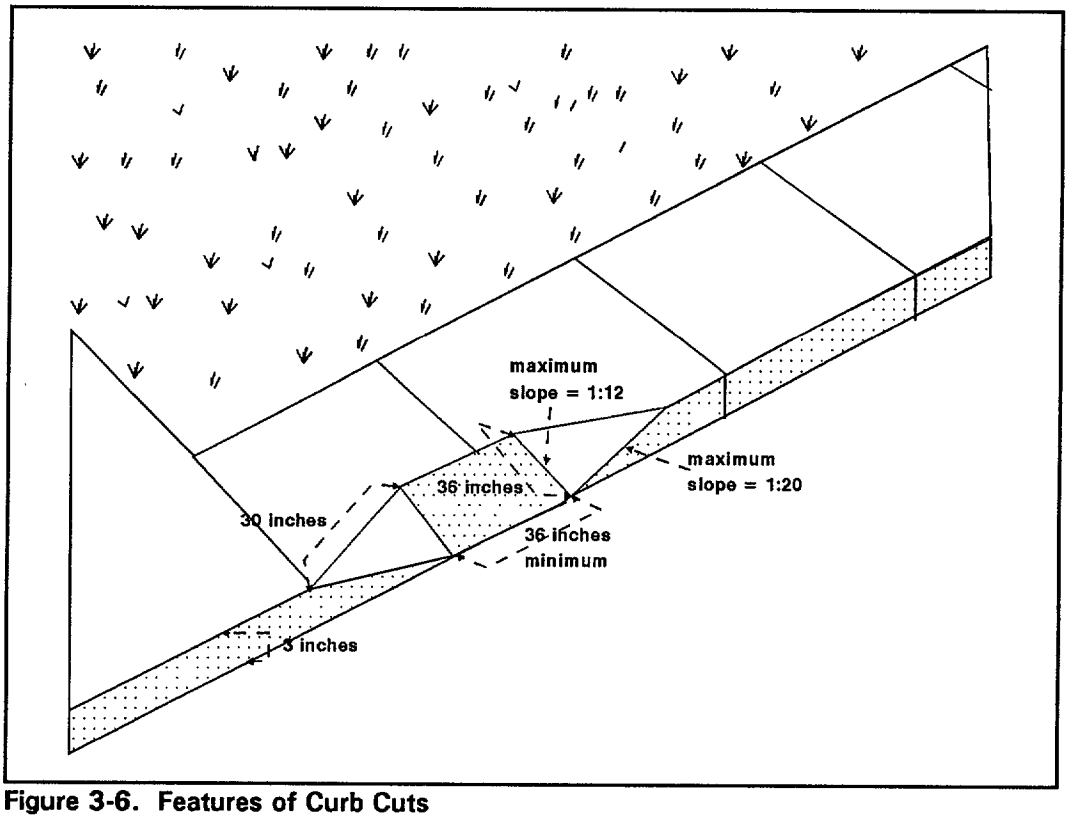


Figure 3-6. Features of Curb Cuts

Two common styles of curb ramps are flared and returned. Flared curb cuts have slopes on either side of the ramp. Returned curb cuts have sides that rise vertically from the foot of the ramp to the sidewalk level. Some states do not allow returned curb cuts because the vertical sides are a hazard. Flared curb cuts are the first choice. If pedestrians must cross a curb cut, it must have flared sides rather than returned, unless it is protected by handrails or guardrails (*49 CFR 37: Section 4.7.5 of Appendix A*).

Dimensions of Curb Cuts

Curb cuts must meet the three basic dimensions specified in the ADA Final Rule ***(49 CFR 37: Section 4.7 of Appendix A).***

1. Minimum width is 36 inches, not including the width of the flared sides ***(49 CFR 37: Section 4.7.3 of Appendix A).***

2. The maximum slope of the curb cut is 1 :1 2, the same as for ramps ***(49 CFR 37: Section 4.7.3 of Appendix A).***

3. The maximum slope of flared sides is 1: 10; **1:** 12 if there is level landing at the top which is less than 48 inches (49 ***CFR 37: Section 4.7.5 of Appendix A).***

Figure 3-7 shows these dimensions for a flared curb cut on a curb 3 inches high. The curb cut must have no lip at the bottom.

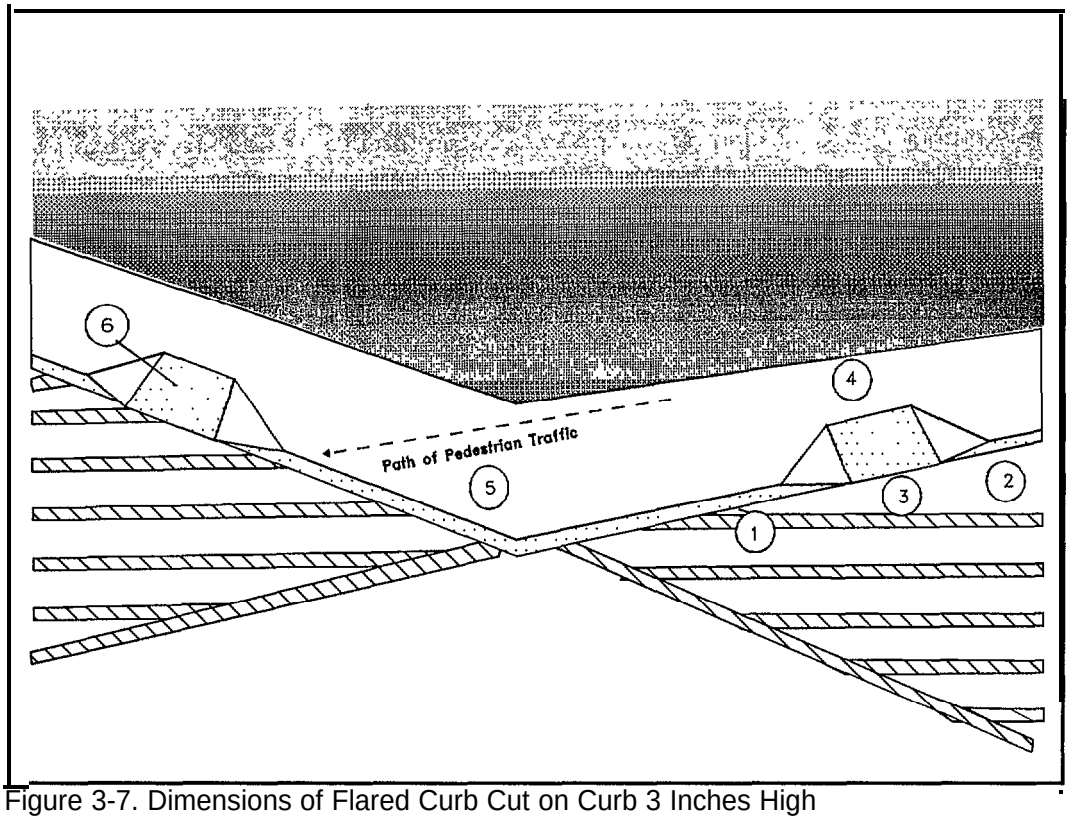


Figure 3-7. Dimensions of Flared Curb Cut on Curb 3 Inches High

Diagonal Curb Cuts

Some localities have installed diagonal curb cuts, which fit at the point of the corner of the sidewalk. This type of curb cut eliminates the need for separate curb cuts facing both directions at an intersection. However, safety considerations can make these curb cuts more difficult to place, and they may not be practical in all situations. Diagonal curb cuts must meet the following specifications:

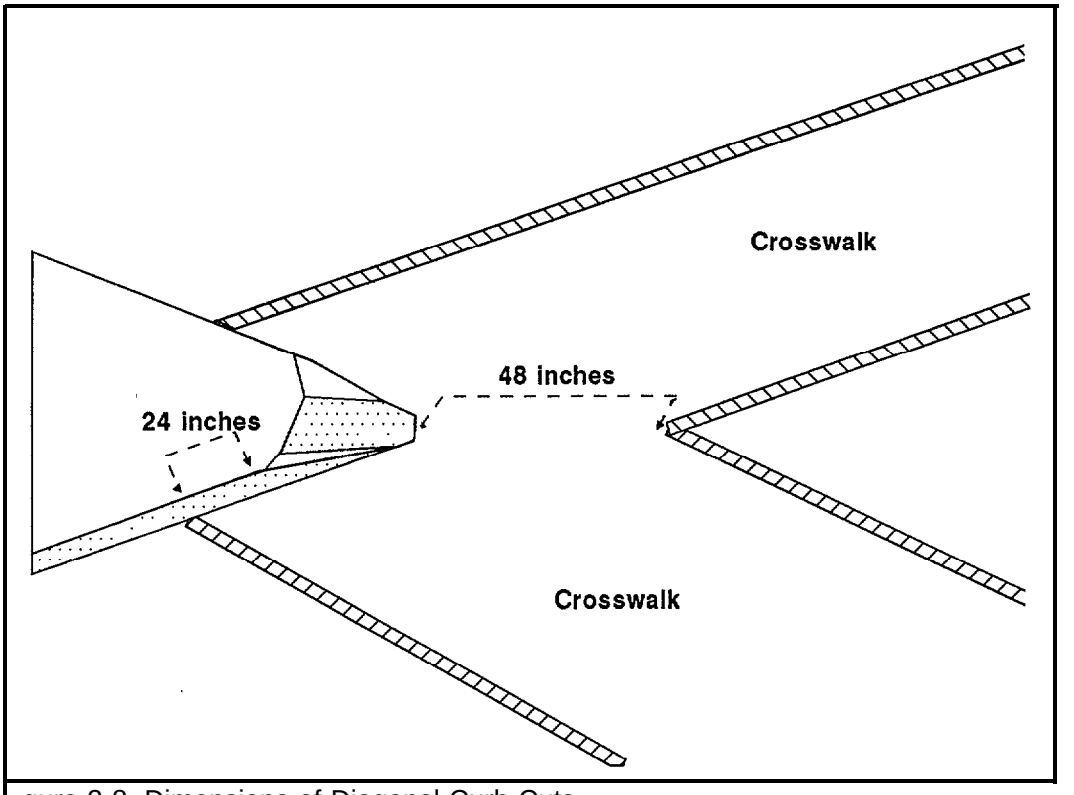
1. They must have a minimum clear space (that is, an unobstructed area at the foot of the curb ramp that does not protrude into vehicle traffic lanes) of 48 inches at the bottom, between the foot of the ramp and the traffic lanes.

2. If the crosswalk is marked, the entire 48 inches of clear space must be included in the crosswalk.

3. If the diagonal curb cuts have returned edges, the edges must be parallel to the flow of pedestrian traffic.

4. If the diagonal curb cuts have flared sides, there must be 24 inches of straight curb on each side of the curb cut. The 24 inches of straight curb must also be included in the crosswalk ***(49 CFR 37: Section 4.7.70 of Appendix A).***

Figure 3-8 shows the dimensions of diagonal curb cuts. The requirement for 48 inches of clear space at the foot of the curb cut and within the crosswalk moves the crosswalk itself further into the areas of vehicle traffic. Thus, the person using the curb ramp does not inadvertently move directly into traffic. However, if streets and vehicle traffic lanes are narrow, this curb cut might not be a practical option. Determining the best type of curb cut requires careful evaluation of areas where the curb cuts will be installed.



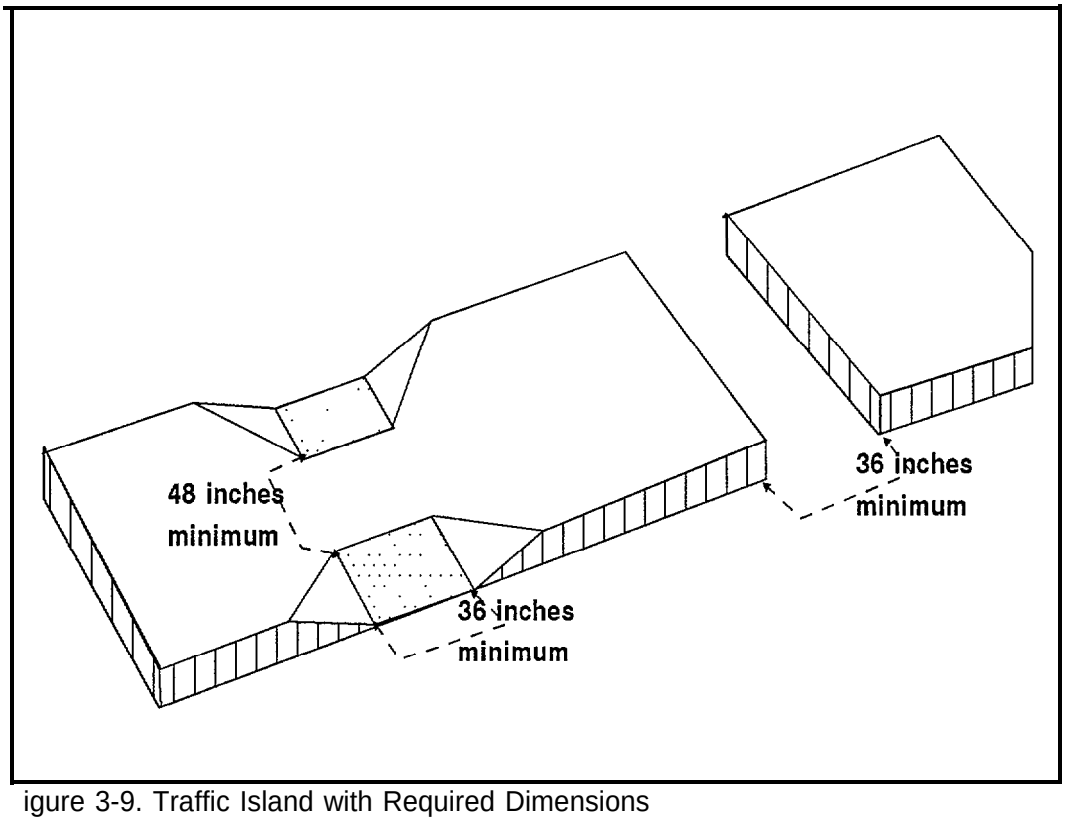
gure 3-8. Dimensions of Diagonal Curb Cuts

Traffic Islands

Factors to consider include any curbs that would obstruct an accessible path, including traffic islands or similar structures. Traffic islands must be cut through and made level with the street.

Traffic islands may also be equipped with ramps, provided there is room for at least 48 inches of level surface between the two ramps. For example, if the curb on the island is 3 inches high, the ramp on the curb cuts on each side of the island would need to be 36 inches long. The island would have to be at least 120 inches for ramps to be installed (36 + 36 + 48 = 120). If it were narrower, the walkway would have to be cut to the street level. If it were 120 inches **or** wider, the two options would be installing ramps or cutting the island to make it level with the

street. Figure 3-9 shows a traffic island treated with ramps at one end and cut through to the street level at the other end, with required dimensions shown.



igure 3-9. Traffic Island with Required Dimensions

Grass or slick materials are not safe surfaces for wheelchair travel and can be difficult for individuals with canes or crutches. The ramp or path cut through the island must have a stable and slip-resistant surface.

3.1.1.6 Ramps

Ramps are a major feature of accessible paths. Any accessible route, or portion of a route, with a slope greater than 1:20 is considered a ramp (49 ***CFR 37: Section 4.8.7 of Appendix A).*** Ramps or any other sloped surfaces must be installed with the most gradual slope possible. The slope of any particular area can be reduced by extending the path length over which the person travels. A longer ramp has a gentler slope.

The ADA Final Rule specifies the following parameters for ramps:

1. **The maximum running slope is 1 :12 (49 CFR 37: *Section 4.8.2 of Appendix A).* (Exceptions are described next.) The maximum cross** slope is 1:50.

2. **The maximum rise for any ramp is 30 inches (49 *CFR 37: Section* 4.8.2). As mentioned earlier, any change in level greater than1/2 inch must be equipped with a ramp (49 *CFR 37: Section 4.52).***

3. **The minimum clear width of the ramp is 36 inches (49 *CFR 37: Section 48.3).***

Figure 3-10 shows a ramp with the required dimensions.

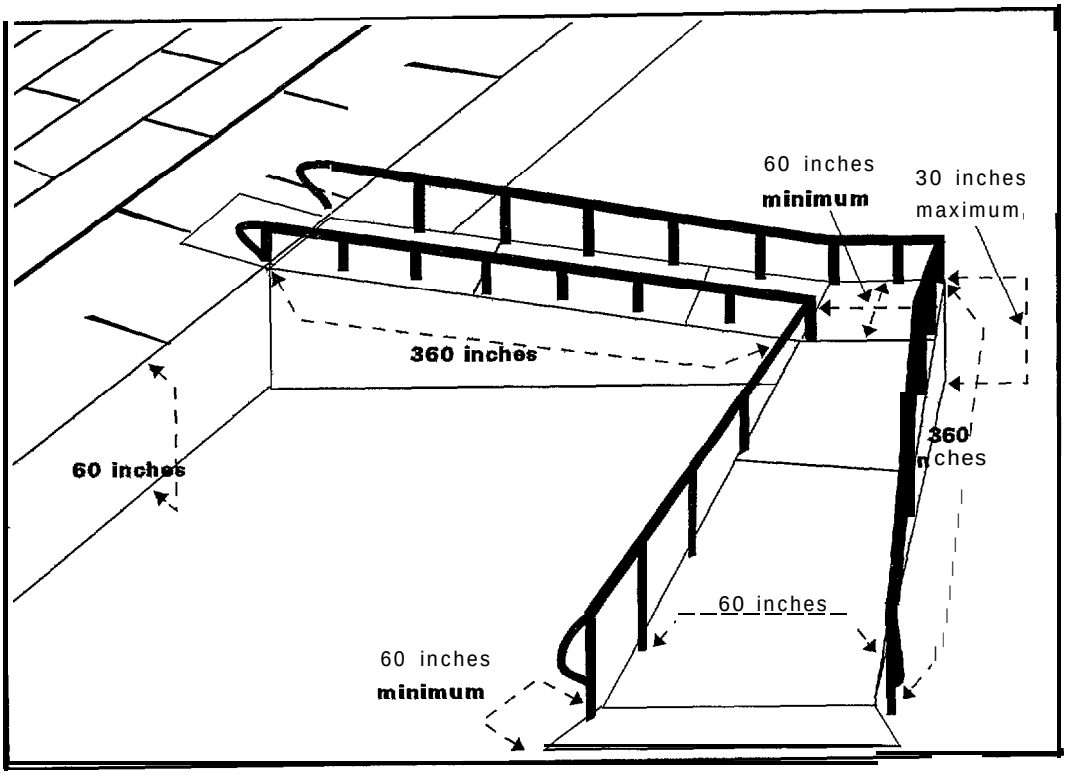


Figure 3-10. Minimum Required Dimensions of a Ramp

In addition to specifying dimensions, the ADA Final Rule also specifies features required on ramps:

+ landings;

+ handrails; and

+ edge protection.

Exceptions to Minimum Slope

The ADA Final Rule states that if space limitations in the alteration of an existing facility prohibit use of a slope of 1: 12, a maximum slope of 1 .10 is permitted for a maximum rise of 6 inches. A maximum slope of 1:8 is permitted for a maximum rise of 3 inches. A slope of 1:8 is the absolute maximum permitted ***(49 CFR 37: Section 4. 7.6 of Appendix A).***

For example, if the space does not allow a ramp long enough to decrease the slope to 1:12, a shorter ramp can be installed. If the vertical rise is 3 inches, a ramp 24 inches long may be installed (slope of 1:8). For a slope of 1 :1 2, the ramp would have to be 36 inches long on the 3-inch vertical rise. If the vertical rise is 6 inches and a 72-inch ramp cannot be installed due to space limitations, a 60-inch ramp may be installed (slope of 1 :10). If the vertical rise is greater than 6 inches, a slope of 1: 12 or less must be provided.

Landings

All ramps must have level landinas at the top and the bottom. The landing allows people in wheelchairs to stop safely before and after a ramp. It also allows people to pass each other and provides space for changing directions. When the ramp leads to an entrance, the landing offers space for opening doors.

Landings must have the following minimum dimensions (49 ***CFR 37: Section 4.8.4 of Appendix A):***

1. Width: at least as wide as the ramp leading to it;

2. Length: a minimum of 60 inches of clear length;

3. For a change of direction at the landing: minimum width of 60 inches and minimum length of 60 inches; and

4. For a doorway at the landing: various specifications depending on the door operation and location. **(Section 3.2, Entrances,** describes this situation in more detail.)

Handrails

Any ramp with a rise greater than 6 inches or a horizontal run of more than 72 inches must have handrails ***(49 CFR 37: Section 4.8.5 of Appendix A).*** The detailed description in the ADA Final Rule provides useful guidelines for installing handrails for use by anyone.

Handrails are required to:

1. ***Be provided along both sides of the ramp (49 CFR 37: Section 4.8.5 of Appendix A);***

2. Be continuous on the inside rail of switchback or dogleg ramps; and if not continuous, extend at least 12 inches (parallel with the ground) beyond the top and bottom of the ramp segment ***(49 CFR 37: Section 4.8.5 of Appendix A);***

3. Provide 1 1/2 inches of clear space between the handrail and the wall, if any (49 ***CFR 37: Section 4.8.5 of Appendix A);***

4. Be mounted so the top of the handrail is between 34 and 38 inches above the ramp surface ***(49 CFR 37: Section 4.8.5 of Appendix A);***

5. Have rounded or smoothly returned ends ***(49 CFR 37: Section 4.8.5 of Appendix A);***

6. Be stable within their fittings ***(49 CFR 37: Section 4.8.5 of Appendix A);***

7. Have a gripping surface of a diameter or width between 1 1/4 and 1 1/2 inches ***(49 CFR 37: Section 4.26.2 of Appendix A);***

8. Be recessed a minimum of 3 inches deep if located in a recess while extending a minimum of 18 inches above the top of the rail ***(49 CFR 37: Section 4.26.2 of Appendix A);***

9. Be free of any sharp or abrasive surfaces on either the handrail or the adjacent wall ***(49 CFR 37: Section 4.26.4 of Appendix A);*** and

10. Have continuous gripping surfaces.

3.1.2 PASSENGER DROP-OFF FROM A VEHICLE

Many people get to the station by being dropped off. The vehicle used may be a private automobile, one of the transit system's buses or vans, or a bus from another transit operator. These passengers need a safe and accessible drop-off area, along with an accessible path to the station entrance.

3.1.2.1 Visibility

When a vehicle approaches a station, the drop-off area should be easy to see. Signs and markings on the road should lead the vehicle right to the area.

If a new drop-off area is being installed, it should be as convenient and visible as possible. The drop-off area should be located near the accessible entrance of the facility. In addition, it must be located so that the pathway to the entrance is accessible. Like other accessible features, it must also be located as near as possible to the normal flow of pedestrian and vehicle traffic.

3.1.2.2 Drop-off Area Signs

For the passenger drop-off area, signs should indicate the location of the facilitiy entrance, the direction of the accessible path to the entrance, and the location of the accessible drop-off area.

Sections 3.1.1.1 Signs, and **3.1.1.2, Placement of Signs,** describe sign requirements.

Signs that show the location of the accessible passenger drop-off and loading zone must include the International Symbol of Accessibility and meet the applicable requirements for signs ***(49 CFR 37: Section 4.7.2 of Appendix A).***

The signs showing the location of the accessible passenger drop-off area should display characters and letters of the size required for the expected viewing distance. The sign should be visible and readable from

whatever point the driver of the vehicle enters that part of the parking lot or driveway ***(49 CFR 37: Section 4.30.3 of Appendix A).***

The letters and numbers of the sign should have a width to height ratio of between 3:5 and 1 :1. In addition, the stroke width to height ratio must be between 1:5 and 1:10 ***(49 CFR 37: Section 4.30.2 of Appendix A).*** Figure 3-l shows a sample sign for the required letter sizes and proportions.

3.1.2.3 Dimensions of Passenaer Drop-off Area

The passenger drop-off area is the area adjacent to the sidewalk or the area before an entrance that provides sufficient space for the vehicle to pull out of traffic and unload the passenger. The key point is to provide sufficient room for a person in a wheelchair or with other impairments to safely alight from a vehicle away from the flow of traffic. The area must also have sufficient room for the person to move to the accessible pathway.

The ADA Final Rule specifies an access aisle that is adjacent and parallel to the area where the vehicle pulls up. The aisle **must** also be a minimum of 60 inches wide and 20 feet long ***(49 CFR 37: Section 4.6.6 of Appendix A).***

An additional requirement is a minimum of 114 inches of vertical clearance at the passenger drop-off area and along at least one vehicle access aisle ***(49 CFR 37: Section 4.6.5 of Appendix A).***

3.1.2.4 Curb Cuts

If the passenger drop-off area is adjacent to a sidewalk, **a** curb cut must be provided. A curb cut that leads into the access aisle should be installed near the end of the aisle so that a parked vehicle would be a less likely obstruction. **Section 3.1 .1.5, Curb Cuts,** describes curb cuts.

3.1.2.5 Ramps

Any portion of an accessible pathway with a slope greater than 1:20 is considered a ramp. **Section 3.1 .1.6, Ramps,** describes requirements for ramps.

3.1.3 PARKING

Individuals with disabilities may also approach the station by driving their own vehicles. The ADA Final Rule includes specifications for the number of accessible parking spaces and their dimensions, their location, and the requirements for an accessible pathway from the accessible parking spaces to the facility entrance.

3.1.3.1 Signs

Accessible parking spaces must be clearly marked with signs that include the International Symbol of Accessibility.

3.1.3.2 Number of Accessible Parking Spaces

If parking is provided at the station, some of the spaces must be accessible. Table 3-1 shows the required number of accessible parking spaces based on the total number of parking spaces provided (49 ***CFR 37: Section 4.7.2 of Appendix A).***

Table 3-I. Required Number of Accessible Parking Spaces

Total Parking Spaces	Required Number of Accessible Spaces
I-25	1
26-50	2
51-75	3
76-I 00	4
101-150	5
151-200	6
201-300	7
30 I-400	8
401-500	9
501-I ,000	2% of total
1,001 and over	20 plus 1 for each 100 over 1,000

In addition, one of every eight accessible spaces, and at least one, must be van-accessible, which means that the width of the access aisle is larger ***(49 CFR 37: Section 4.7.2 of Appendix A).***

The total number of parking spaces refers to all lots for the station, but the accessible spaces should not necessarily be evenly distributed among all the lots associated with the station unless better access is achieved. In fact, a better choice would be to concentrate the accessible spaces in lots and locations that are closest to the accessible entrance by the shortest accessible pathway.

3.1.3.3 Dimensions of Accessible Parking Spaces

Accessible parking spaces must be at least 96 inches wide (49 ***CFR 37: Section 4.7.2 of Appendix A).*** Adjacent to the parking space there must be an access aisle at least 60 inches wide. An accessible aisle between two accessible parking spaces can be shared by the two spaces ***(49 CFR 37: Section 4.6.3 of Appendix A).*** The maximum slope in all directions **is 1:50.**

Accessible parking spaces for vans must also be 96 inches wide; in addition, the access aisle must be at least 96 inches wide (49 ***CFR 37: Section 4. 7.2 of Appendix A).*** A vertical clearance of 98 inches must be provided at van-accessible spaces and along a vehicular path to and from them.

3.1.3.4 Location of Accessible Parking Spaces

Accessible parking spaces must be located on the shortest accessible route of travel to the accessible entrance ***(49 CFR 37: Section 4.6.2 of Appendix A).*** The location of the parking lot, the accessible entrance, and the length of the accessible path should be considered when determining which parking areas are closest to the building. If a parking lot is not right next to a building, the accessible parking spaces should be located along the shortest accessible pathway to the accessible entrances to the buildings. When more than one accessible route leads to the entrance, the best location for the parking spaces is along the shortest route. When a number of accessible entrances have parking adjacent to them, the accessible spaces by the various entrances must be dispersed ***(49 CFR 37: Section 4.6.2 of Appendix A).***

The access aisles for the accessible parking spaces themselves must become part of the accessible route. For example, if the parking spaces touch a sidewalk, a curb cut must be installed at the position of each access aisle. Similarly, traffic islands and parking barriers must be sized and positioned so that they do not interfere with movement from the access aisle to the route to the entrance. The access aisle and parking space must be at the same level and a curb ramp must not intrude into the access aisle.

Figure 3-11 shows the dimensions of accessible parking spaces and the location of curb cuts.

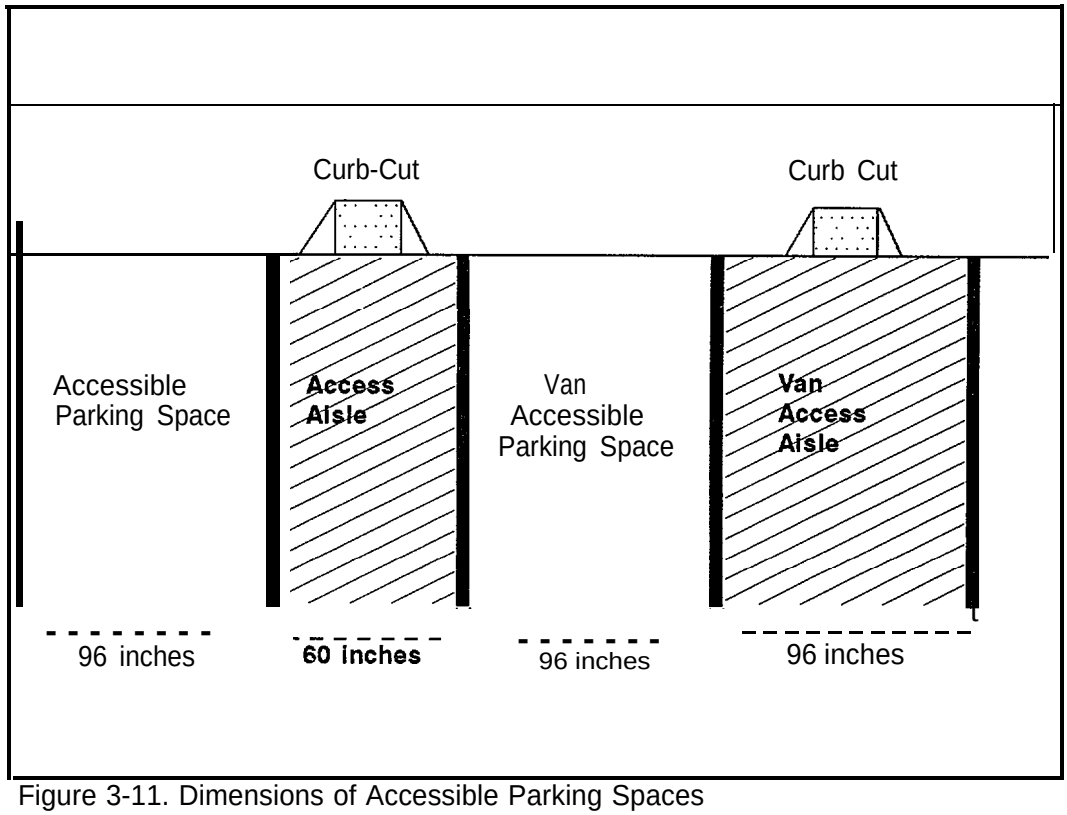


Figure 3-11. Dimensions of Accessible Parking Spaces

3.1.3.5 Curb Cuts

Curb cuts at the access aisle must comply with the specifications in the ADA Final Rule. **Section 3.1 .1.5, Curb Cuts,** describes requirements for curb cuts.

3.1.3.6 Accessible Pathway from Accessible Parking

The access aisle of accessible parking spaces becomes a part of the accessible pathway to the entrance of the station. Plans for an

accessible pathway must include the following changes if any of them prove an obstacle to people with an impairment:

+ surface;
+ path width; and
+ obstacles.

Section 3.1.1.4, Accessible Pathway, describes the requirements for an accessible pathway.

3.1.4 OTHER TRANSIT MODES

Passengers often arrive at a station by a different transit mode from the one on which they started. Passengers may arrive at a commuter rail station or subway station by a transit bus. Passengers may transfer from a commuter rail station to a subway station. Transfers to change routes within one transit mode may take place wholly within the building. However, transfers from one mode to another may involve crossing a parking lot and other spaces along an accessible path.

This discussion focuses on the transfer from a bus to a rail station or subway station, but the requirements apply to any type of transfer. The differences would be in the specific accessible features of a bus stop in comparison to any other type of transit stop.

3.1.4.1 Signs

When new signs are installed, they must meet the sign specifications described in **Section 3.1.1.1, Signs,** and **Section 3.1.1.2, Placement of Signs.**

3.1.4.2 Location of Transit Stop

When changes for stations, transit stops, and the accessible pathways between them are carefully planned, the result is the greatest accessibility with a minimum of disruption of normal traffic patterns of people moving between transit modes.

For example, the accessible pathway between transit modes should be along the same travel path that all passengers use. If a shorter pathway or a shorter accessible pathway can be provided, it might be best to move the transit stop.

For the most part, the transit stop is located as close to the station as traffic will allow. If possible, the entrance closest to the transit stop should be accessible. If it is not, then changing the location of the transit stop or adding an entrance accessible to people with disabilities is a good improvement.

If an accessible pathway already leads to the station entrance, that pathway should be **designed so that it meets the transit stop, or the** transit stop could be moved so that it intersects the accessible pathway. It depends on which is possible and which is more practical.

3.1.4.3 Safe Path to Station

In addition to an accessible oath between the transit stop and the accessible entrance to the station, the design must include a safe oath. People with disabilities usually move more slowly than many people. Individuals in wheelchairs are lower to the ground and may not be as visible to drivers in a busy parking lot.

Transit stops are often across the street or across the parking lot from the station, so the path that people will be taking should be designed for the greatest possible safety.

The path should follow sidewalks as often as possible. That requirement must be weighed, however, against the length of the path if it circumnavigates a large parking lot. People will tend to cut across a lot or intersection rather than follow a roundabout **route.**

For example, if the parking lot has no sidewalk on the route that leads between the transit stop and the station, but people cross there regularly, a crosswalk could be established by painting stripes on the pavement and, perhaps, posting pedestrian crossing signs. If the new crosswalk becomes part of the accessible path, curb cuts and ramps must be installed.

3.2 ENTRANCES

This description of accessible entrances includes their location and doors.

3.2.1 LOCATION OF ACCESSIBLE ENTRANCE

According to the ADA Final Rule, at least one public entrance must be accessible to individuals with disabilities, and at least one accessible entrance must be on a ground floor. In addition, the number of accessible entrances must be equal to or greater than the number of exits required by the applicable fire and building codes (49 ***CFR 37: Section 4.7.3 of Appendix A).*** Providing the number of accessible entrances as required by building codes does not necessarily increase the overall number of entrances planned for the facility. The better solution would be to make all or most planned entrances accessible.

Wherever an accessible entrance is installed or designed, it must be an integral part of the accessible route. The accessible routes from the transit stops, accessible parking spaces, passenger drop-off areas, and public streets or sidewalks must lead to accessible entrances to the facility. The accessible entrances must also be connected by accessible routes to all the accessible features of the facility ***(49 CFR 37: Section 4.74.7 of Appendix A).***

The requirements for accessible entrances and routes impact planning for the location of the entrances that will be designed for accessibility. The locations of the accessible entrances should ensure that accessible routes to all accessible interior and exterior elements can be installed. Each entrance should be evaluated to determine which can be made accessible and placed on an accessible route in the most cost-effective manner. Selecting entrances for accessibility should focus on the least disruption to the normal flow of traffic.

The ADA Final Rule is very clear in stating that a service entrance cannot be the only accessible entrance ***(49 CFR 37: Section 4.74.2 of AppendixA).*** The regulations specifically describe the features of public entrances and define public entrances as any entrances that are not loading or service entrances ***(49 CFR 37: Section 4.7.3 of Appendix A).***

3.2.2 DOORS

At each accessible entrance, at least one door must comply with the accessibility requirements.

3.2.2.1 Accessible Door Width

The doors must be wide enough for a person in a wheelchair to enter, so they must have at least 32 inches of clear width. That width is measured between all handles or protrusions on the door and the latch-side jamb when opened to ***90*** degrees ***(49 CFR 37: Section 4.73.5 of Appendix A).***

If the doorway depth is more than 24 inches, it is more like a continuous part of the pathway than a single point along the accessible pathway. In this situation, the minimum width of the doorway is 36 inches ***(49 CFR 37: Section 4.73.5 of Appendix A).***

If the doorway consists of two independently operating leaves, at least one leaf must provide sufficient width and maneuvering space (49 ***CFR 37: Section 4.73.4 of Appendix AI.*** A person in a wheelchair must need to operate only a single leaf of the door to enter or exit the building; therefore, both should be wide enough for the individual to enter, and the wide one must provide sufficient maneuvering space for the individual to operate it. Figure 3-12 shows the required doorway widths for entrance doors.

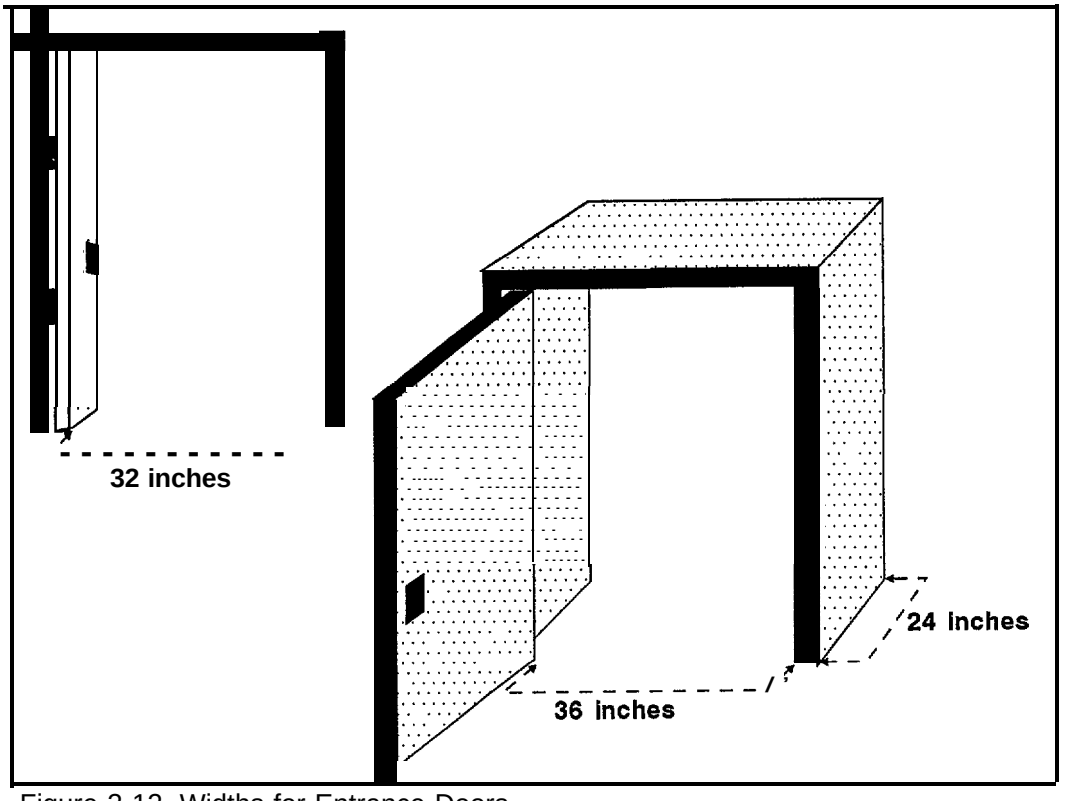


Figure 3-12. Widths for Entrance Doors

3.2.2.2 Threshold Heights

The maximum threshold height for doors (other than exterior sliding doors) is 1/2 inch ***(49 CFR 37: Section 4.73.8 of Appendix AI.*** The maximum threshold height for exterior sliding doors is 3/4 inch (49 ***CFR 37: Section 4.73.8 of Appendix A).*** Like other changes in level along an accessible pathway, changes between 1/4 inch and 1/2 inch must be treated with beveling to a slope no greater than 1:2. Changes between 1/2 inch and 3/4 inch must include a ramp with a slope no greater than ***1:12 (49 CFR 37: Section 4.5.2 of Appendix A)***. Figure 3-3 shows the requirements for changes in levels.

3.2.2.3 Revolving Doors

Revolving doors and turnstiles cannot be the only means of entry into the station ***(49 CFR 37: Section 4.73.2 of Appendix A).*** However, they need to be replaced only if there is not enough room to install accessible doors as well. Accessible routes must be as similar as possible to the route taken by all passengers entering the facility. For example, individuals with disabilities must not have to enter through an employee entrance while all others are entering by the turnstiles.

Gates, including ticket gates, must also meet all the applicable requirements for accessible doors ***(49 CFR 37: Section 4. 73.3 of Appendix A).***

3.3 MANEUVERING SPACE AROUND DOORS

Doors that are not automatic or power-assisted must have sufficient maneuvering space on both sides. For the most part, the maneuvering space includes enough depth in front of the door for an individual in a wheelchair to back up and fully open the door. The maneuvering space must also include enough clear space at the side of the door, on the latch side, for an individual in a wheelchair to maneuver around the open door and into the door opening.

The exact space requirements vary somewhat depending on how individuals approach the door. Many doors are approached directly from the front, but accessible doors can be approached from the side on a ramp, provided there is a level landing of the appropriate size at the door. An accessible ramp can lead up or down to the front of the door, but it can also approach the door from the side. For example, when the length of the ramp is being increased in order to reduce the slope, ramps can then be installed parallel to the building or even turn or switch back to fit the necessary length into the available space. From whatever direction the ramp approaches, the landing must be large enough for the individual to maneuver and use the door.

A clear space must not contain any obstructions-on the ground or around the space-that would prevent an individual in a wheelchair from maneuvering. In addition, the clear space must not be covered

with a material that makes it difficult to move a wheelchair and should not include changes in level greater than 1/4 inch.

When accessible doors and their approaches are designed, these space requirements may conflict with the space available at doors. Changing the direction of approach or moving the hinge of the door from one side to another may provide sufficient space.

The space available on either side of a door should determine the direction in which it will open. For example, the pull side of the door requires more space on the landing than the push s'ide requires. Thus, if one side of the door has a ramp and the other side is an open courtyard, the door should open into the courtyard rather than onto the landing of the ramp. In addition, such designs must take into account relevant building and fire codes.

3.3.1 FRONT APPROACH

The most common direction for approaching a door is from the front, although the installation of new ramps may make other approaches common. A greater amount of clear space is required on the pull side of the door than on the push side because the user and the door must have space in the clear area in front of the door. In addition, the person must have enough room to maneuver the wheelchair around the door. The bull side of the door must have a minimum of 60 inches of clear depth in front of the door. The latch side of the door must have a minimum of 18 inches of clear width, although 24 inches is preferable ***(49 CFR 37: Section 4.13.6 of Appendix A).*** Figure 3-l 3 shows the requirements for the pull side of a door approached from the front.

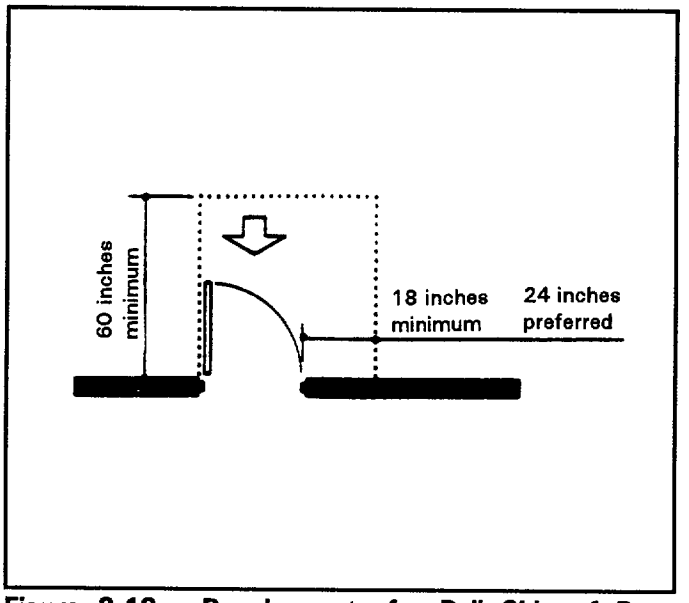


Figure 3-13. Requirements for Pull Side of Door Approached from Front

The push side of the door must have a minimum of 48 inches of clear depth in front of the door (*49 CFR 37: Section 4.13.6 of Appendix A*). There is no specific requirement for additional space at the side of the door because the person will not be maneuvering around the open door to enter. However, if the door is equipped with an automatic closing device and a latch, the requirement is 12 inches to the latch side of the door. Figure 3-14 shows the requirements for the push side of a door approached from the front.

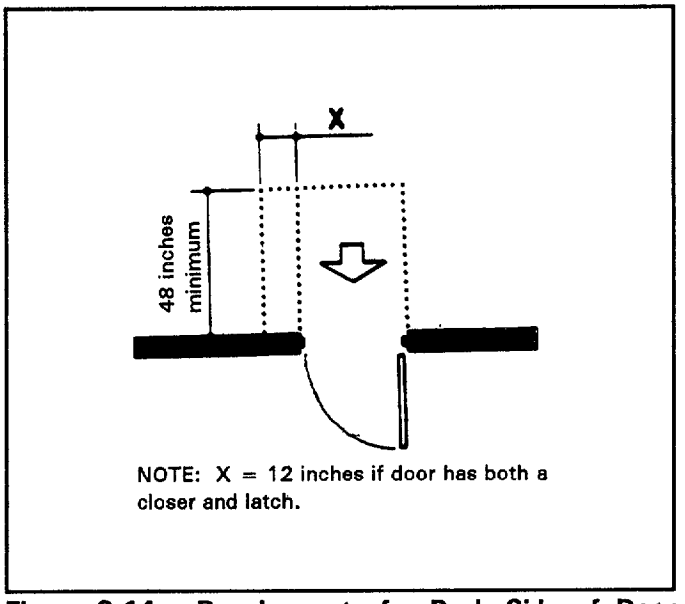


Figure 3-14. Requirements for Push Side of Door Approached from Front

3.3.2 SIDE APPROACH

An approach from the side can require more maneuvering space. An individual must be able to maneuver safely in front of the door without striking obstacles or running onto an uneven surface.

In general, more space must be available if the ramp approaches the door from the hinge side as opposed to the latch side. More space must also be available on the pull side of the door than on the push side. Again, one way to resolve space limitations may be to install doors that open onto the area with the most available maneuvering space and to put hinges on the more convenient side relative to the approach.

3.3.2.1 Latch-Side Approach

Pull Side

On the pull side of the door, a minimum of 48 inches of clear depth must be available in front of the door. If the door has an automatic closing device, 54 inches of clear depth must be available.

With an automatic closing device, an individual may want to open the door to the maximum extent to gain enough time to'get through. The additional maneuvering space allows the door to be opened to the maximum extent. An additional clear width of 24 inches to the side of the latch door is another requirement (49 CFR 37: Section 4.13.6 of ***Appendix A).*** Figure 3-15 shows the required dimensions for the maneuvering space on the pull side of a door approached from the latch side.

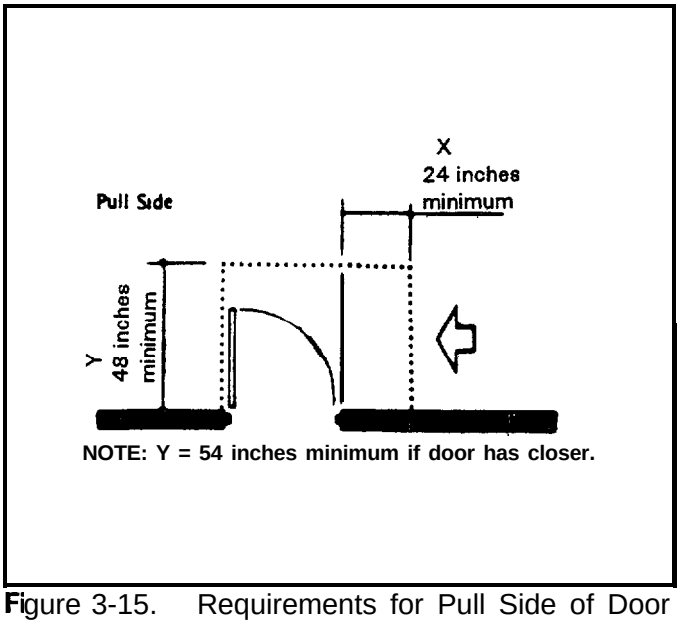


Figure 3-15. Requirements for Pull Side of Door Approached from Latch Side

Push Side

On the push side of the door, a minimum of 42 inches of clear depth must be available in front of the door; 48 inches if the door has an automatic closing device; and a minimum of 24 inches of clear width to the latch side ***(49 CFR 37: Section 4.13.6 of Appendix A).*** Figure 3-l 6 shows the requirements for the maneuvering space on the push side of a door approached from the latch side.

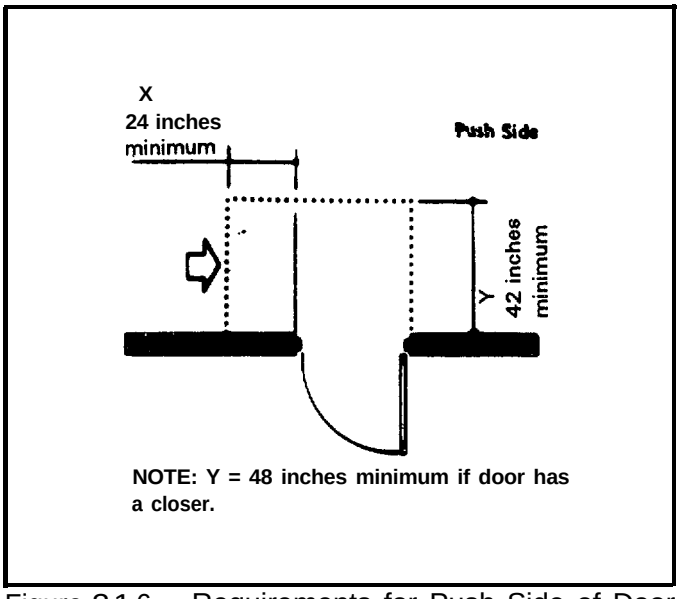


Figure 3-1 6. Requirements for Push Side of Door Approached from Latch Side

3.3.2.2 Hinge-Side Approach

Pull Side

On the pull side of the door, a minimum of 54 inches of clear depth must be available in front of the door. If 54 inches of depth is provided, a minimum of 42 inches of width must be available on the latch side. **If** 60 inches of clear depth is available in front of the door, a minimum of 36 inches of additional width must be available on the latch side (49 ***CFR 37: Section 4.13.6 of Appendix A).***

These dimensions allow additional maneuvering space, either on the side of the door or directly in front of it. Opening the door from the pull side means pulling the door open by maneuvering in front of it or from the side. The space provided will determine which method would be more appropriate. Figure 3-17 shows the requirements for the pull side of a door approached from the hinge side.

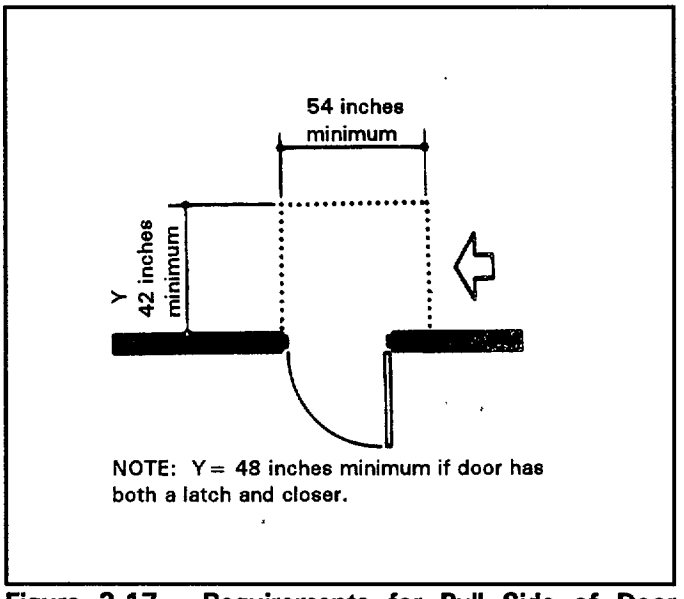


Figure 3-17. Requirements for Pull Side of Door Approached from Hinge Side

Push Side

On the push side of the door, a minimum of 42 inches of clear depth must be available and a minimum width of 54 inches from the latch to beyond the hinge of the door. The 54 inches in width include the width of the door, plus an additional 22 inches or more to the latch side of the door (*49 CFR 37: Section 4.13.6 of Appendix A*). Figure 3-18 shows these requirements for the push side of a door approached from the hinge side.

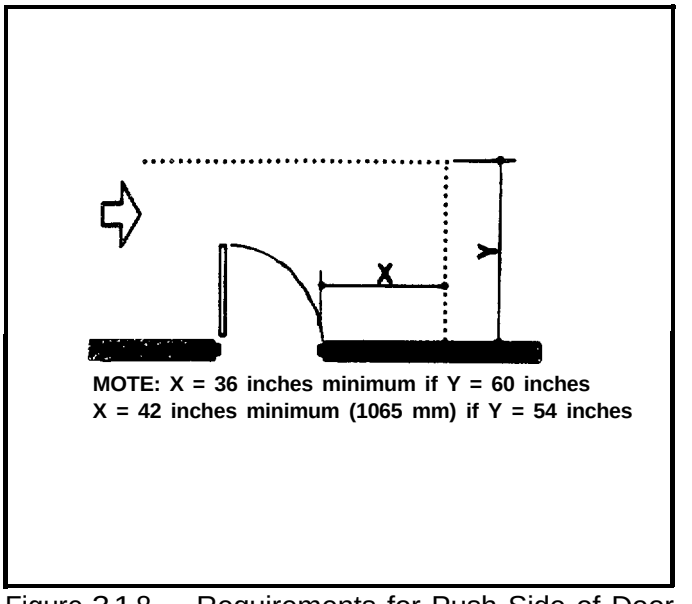


Figure 3-18. Requirements for Push Side of Door Approached from Hinge Side

3.3.3 TWO DOORS IN SERIES

Many facilities have two doors in series, with a vestibule in between. People with disabilities often have a problem with these types of doors because there is not enough room between them to maneuver and open the doors. A person in a wheelchair needs enough room to be in the vestibule and to fully open a door that opens onto the vestibule, or the person can become trapped between the doors.

In addition to providing sufficient space between the two doors, the design plan can gain more maneuvering space by offsetting the doors rather than having them open right in front of each other. If the doors are offset by moving them away from each other in the direction of their hinges, most of the space in front of one of them will be available to maneuver a wheelchair. Figure 3-19 shows this concept. Each of the maneuvering space requirements discussed before must be applied to each door individually. This placement of doors, however, does not replace the space requirements of the ADA Final Rule, as discussed next.

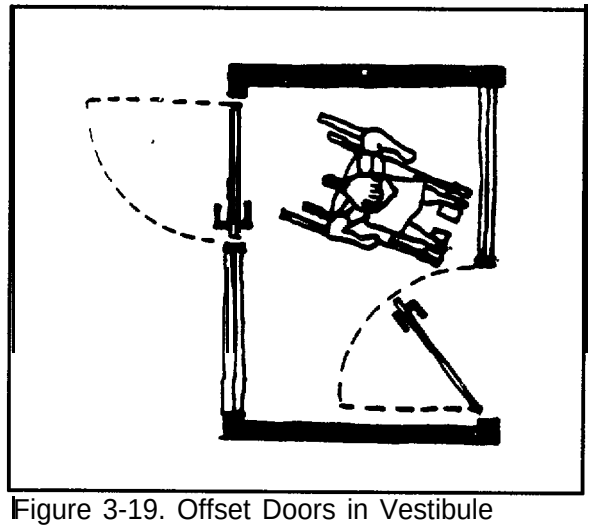


Figure 3-19. Offset Doors in Vestibule

The minimum distance between two doors in series is the sum of the width of the door swinging into the space plus 48 inches. The doors must also swing in the same direction, or both must swing away from the vestibule space. They cannot be arranged so that both doors swing into the vestibule ***(49 CFR 37: Section 4. 73.7 of Appendix A).*** Maneuvering space between vestibule doors can be increased by having both doors open away from the vestibule. However, this approach must be considered in conjunction with the maneuvering space available on the outside of the vestibule. In any case, the door arrangements must comply with relevant safety codes. Figure 3-20 shows the required dimensions of two doors in series.

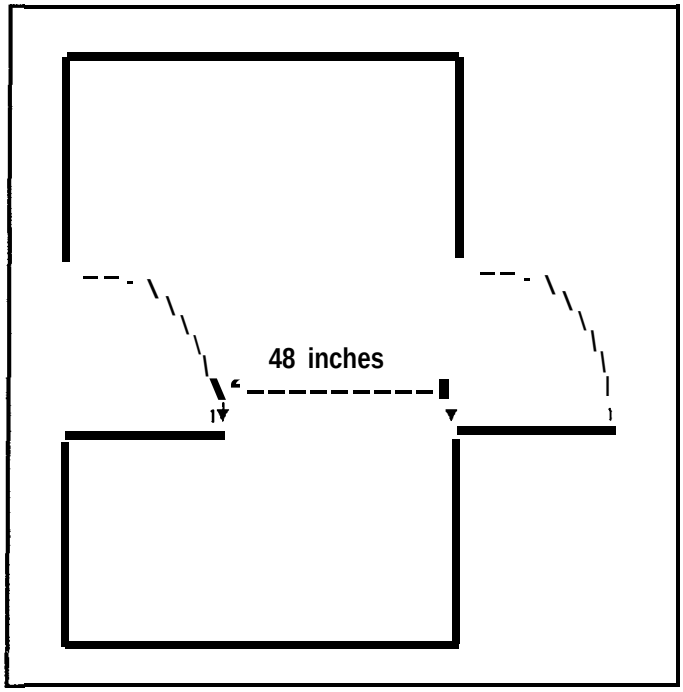


Figure 3-20. Dimensions for Two Doors in Series

3.3.4 DOOR HARDWARE

With many types of impairments, the individual must hold a mobility aid in one hand or use one hand to maintain balance. Individuals in wheelchairs may need to keep one hand on the wheelchair to prevent it from drifting. For people with disabilities, any door must open with the use of one hand.

Some disabilities affect the ability to grasp and to twist the wrist. Many types of door handles can be operated with one hand without twisting. Lever-type mechanisms, push-type mechanisms, and U-shaped handles are specifically mentioned in the Final Rule, but others are available as well (49 CFR 37: ***Section*** 4.73.9 ***of*** Appendix A). Still other devices fit over standard door knobs and convert them to lever handles.

The door hardware used at an accessible entrance can be mounted no higher than 48 inches from the floor (49 CFR 37: ***Section 473.9 of Appendix A).*** At this height, people in wheelchairs can reach it without unnecessary difficulty.

3.3.5 DOOR OPERATION

People with disabilities may have diminished strength and be unable to open heavy or stiff doors. Using lighter doors or installing power assistance can reduce the force required to open doors. An additional recommendation would be to keep doors lubricated and otherwise maintained in good working order.

In addition, the slope of the surface on which the doors are mounted may affect the force needed to open them. Pushing or pulling a door open against even a small uphill grade can be too difficult for a person with disabilities.

3.3.5.1 Door Opening Force

Doors can require no more than 5 pounds of force to open (49 ***CFR 37: Section 4.13.1 7 of Appendix A).*** Accessible doors must meet these requirements, but not all doors must. If the doors to the station are heavy or require excessive force to open, special devices can be installed on the accessible door at each accessible entrance. The device opens the door once it has been pushed and slows down the speed at which the door closes.

Fire doors must have the minimum opening force allowable by the authority regulating fire safety (49 CFR 37: ***Section 4.73. 7 7 of Appendix A).***

3.3.5.2 Automatic Doors

If the space around doorways does not provide the required maneuvering space, or if doors require excessive force to open, one solution is to install doors that automatically close and open. They can be expensive, but may be a more cost-effective alternative than dramatic reconstruction of a facility entrance. Common types of automatic doors

include those that are operated by a photoelectric cell mounted above the door and those operated by pressure on a floor pad.

Also available for accessible entrances are doors operated by a push button or similar device. The door can be used manually by anyone who can push it open, but the button activates the automatic opening for those who cannot. On the pull side of the door, the button must be mounted on an extension so that the person operating it is out of the way of the door as it opens.

Automatic doors must meet ANSI/BHMA Al 56.10-I 985 or ANSI/BHMA Al 56.19-l ***984 (49 CFR 37: Section 4.73.72 of Appendix A).***

Automatic doors must open slowly: no faster than 3 seconds. In addition, anyone must be able to stop the doors safely as they are operating. Automatic doors cannot require more than 15 pounds of force to stop ***(49 CFR 37: Section 4.13.12 of Appendix A).***

Like manual doors, power-assisted doors can require no more than 5 pounds of force to open ***(49 CFR 37: Section 4.73.72 of Appendix A).***

4. INTERIOR ELEMENTS

This section describes the accessibility requirements for elements inside the facility: fare collection, the path, and other elements.

The description of fare collection includes requirements for:

+ location and number;
+ design;
+ signs; and
+ turnstiles and gates.

The description of the path includes requirements for:

+ floors;
+ circulation paths;
+ stairs and ramps; and
+ elevators and escalators.

The descriptions of other elements include requirements for:

+ signs;
+ public address systems;
+ telephones;
+ restrooms;
+ water fountains;
+ emergency alarms;
+ information and vending areas; and
+ baggage check and claims areas.

The appendix, **Facilities Accessibility Checklists,** lists required and recommended features for accessibility.

4.1 FARE SELLING AND COLLECTION

Facilities for selling and collecting fares can take a number of different forms. For transit modes such as subways, the fare collection areas are also the access areas to the subway platform. For other modes, fare collection takes place on board; and riders buy the tickets, tokens, or passes at the platform or from a ticket vendor elsewhere in the facility. An accessible fare collection system must allow a disabled person to purchase tickets or tokens or otherwise pay their fare; and to reach the area where they board the transit vehicle.

Fare selling and collection devices may take the form of a self-service ticket vending machine, a fare collection or ticket vending booth, a ticket-activated turnstile or gate, a fare-collecting transit employee, or variations of these methods, including the use of debit cards or card-reading machines. Whatever the means of selling and collecting fares, access must be provided for persons with disabilities.

4.1.1 LOCATION AND NUMBER

Like other features of accessibility, the location and number of accessible fare selling and collection facilities should be planned to ensure that individuals with disabilities remain with the flow of traffic of all passengers. Individuals with disabilities should not travel an extra distance to use accessible facilities.

Accessible fare selling and collection devices must be located along the accessible route that connects all accessible facilities and accessible entrances. At least one accessible fare selling and collection device must be located at each accessible entrance ***(49 CFR 37: Section 70.3 of Appendix A).***

If self-service devices are available for the general public, at least one must be an accessible self-service device. There must be at least one accessible self-service device for entering and one for exiting the facility, if at least one of each is available to the general public. If a single device is used for exiting and entering the facility, a single accessible device is sufficient ***(49 CFR 37: Section 70.3 of Appendix A).***

Placement of the accessible fare selling and collection devices should be as close to the accessible point of entry or exit as possible (49 ***CFR 37: Section 70.3 of Appendix A).*** If the circulation path for those with disabilities does not coincide with the path used by the general public, the accessible fare collection devices must be located adjacent to the accessible entry or exit point. This placement reduces the distance that individuals with disabilities need to travel between fare selling and collection and the entrance.

For transit modes in which fare collection provides access to the interior of the facility (for example, a subway), the best choice is to locate the accessible fare collection device adjacent to the accessible entrance gate to the platforms. For transit modes in which passengers buy tickets or tokens for collection on the train or bus, the accessible fare collection facility should be adjacent to either the station entrance or the entrance to the train platform or bus stop.

Since all accessible fare selling and collection facilities must be located on an accessible path, the location of the accessible path will help to determine the best location for accessible fare selling and collection.

4.1.2 DESIGN

The design of fare selling and collection devices for use by individuals with impairments should reflect the design of automatic teller machines. In other words, the design must reflect the reach ranges of a person in a wheelchair and the needs of individuals with sight impairments.

In general, fare devices must have a minimum clear opening of 32 inches and must permit passage of a wheelchair ***(49 CFR 37: Section 70.3 of Appendix A).*** Thus, the surface must be free of obstacles, have no changes of level greater than 1/4 inch, and have a maximum slope of ***I:20 (49 CFR 37: Section 4.3 of Appendix A).*** The descriptions that follow assume that the accessible fare devices are located on a wall or other vertical arrangement, or that people approach a ticket window or kiosk. However, the descriptions and dimensions also apply to devices that are not vertical. Individuals in wheelchairs may need to reach

controls on a horizontal surface, and such controls must be in the same reach ranges as described next.

4.1.2.1 Clear Floor Space and Reach Range

The accessible fare selling and collection devices must have a clear floor space that will accommodate a wheelchair. The minimum floor space for a wheelchair is 30 inches by 48 inches. Since the clear space may be rectangular, its position can be such that the wheelchair is either facing the device or parallel to it (*49 CFR 37: Section 4.2.4.1 of Appendix A*). The clear floor space for a wheelchair at an accessible fare device must adjoin or overlap an accessible route, or adjoin another clear floor space for wheelchair accommodation (*49 CFR 37: Section 4.3.4.2 of Appendix A*). Figure 4-1 shows the location of the clear floor space in front of a fare collection device. The dimensions indicate a space facing (A) or parallel (B) to the device.

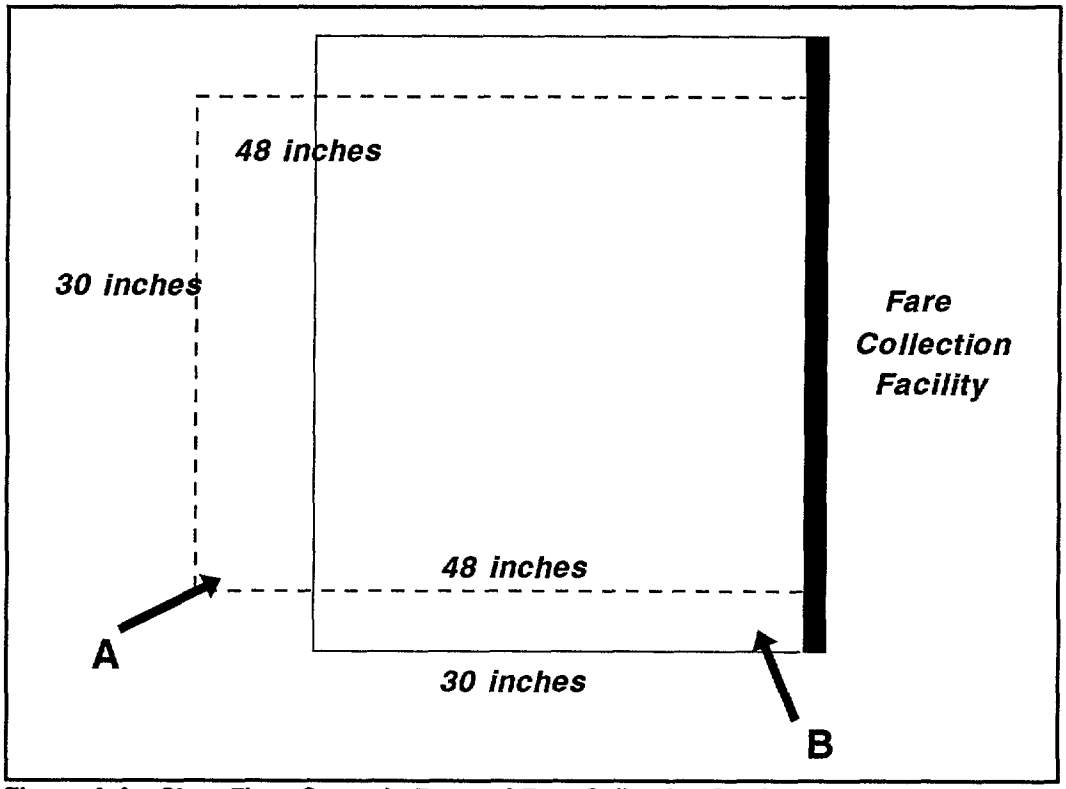


Figure 4-1. Clear Floor Space in Front of Fare Collection Device

4.1.2.2 Controls Location

The orientation of the clear floor space determines where to locate the controls on the device to accommodate the reach range of a person in a wheelchair.

Clear Space Facing Controls

When the clear floor space allows the wheelchair to face the device, the **controls on the device must** be between 15 inches and 48 inches above the floor ***(49 CFR 37: Section 4.2.5 of Appendix A).***

When an obstacle is in front of the controls (a writing surface, for example), it must be no deeper than 25 inches. If the depth of the obstacle is less than 20 inches, the maximum height for the controls is still 48 inches.

However, if the obstacle depth is 20 to 25 inches, the maximum height for the controls is 44 inches from the floor. All the controls must be located above the obstacle. Figure 4-2 shows the reach distances when a wheelchair faces the fare devices ***(49 CFR 37: Section 4.2.5 of Appendix A).***

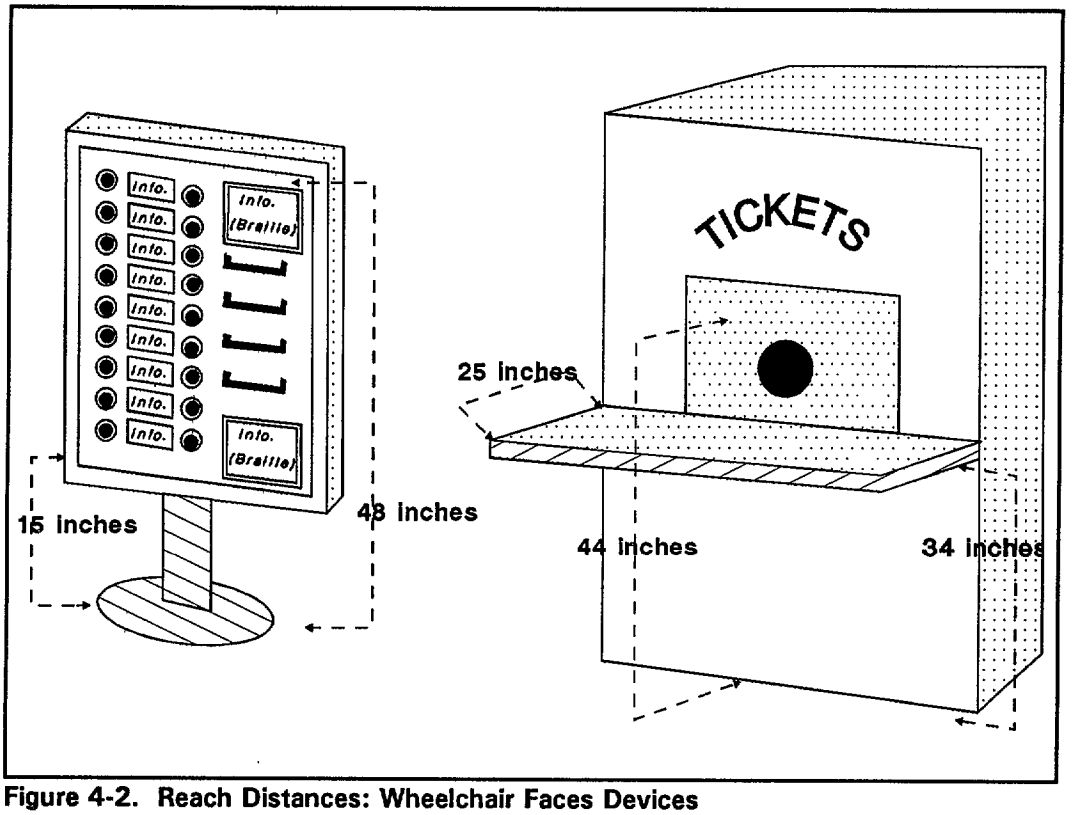


Figure 4-2. Reach Distances: Wheelchair Faces Devices

Clear Space Parallel to Controls

The device must provide for a parallel approach, but may also provide for a forward approach. However, the reach ranges must allow operation of the controls from the forward approach so the reach ranges must conform to the requirements shown in Figure 4-2.

4.1.2.3 Controls Operation

Like other devices designed for disabled individuals, the fare device controls must be operable with only one hand. Operating the controls must not require tight grasping, pinching, or twisting of the wrist. Many disabled individuals must use one hand to hold canes, walkers, or crutches, or to stabilize their wheelchairs. In addition, many conditions prohibit small movements of the hand, excessive grip strength, or twisting of the wrist. The force required to activate the controls of the fare device can be no greater than 5 pounds (49 ***CFR 37: Section 4.27.4 of Appendix A).***

4.1.2.4 Equipment for Persons with Vision Impairments

For fare selling and collection devices, all necessary instructions and information must be accessible to people with vision impairments. Individuals with vision impairments must be able to read the information without assistance ***(49 CFR 37: Section 4.34.4 of Appendix A).***

Although the regulations are not specific about making user information on automatic fare collection devices accessible to persons with vision impairments, the requirements for signs in raised letters and Braille characters are good guidelines ***(49 CFR 37: Section 4.30.4 of Appendix A).*** Raised letters should be raised l/32 inch and should be uppercase in a sans serif or simple serif style. The raised letters should be accompanied by Grade 2 Braille. The raised characters should be between 5/8 inch and 2 inches in size.

Other good additions to assist persons with visual impairments are audible beeps or other sounds when they press buttons; audible alarms for items such as change return and ticket dispensing; and any audible signals for other functions of the accessible fare collection devices, including synthesized human speech.

4.1.3 SIGNS

If some are not accessible, the location of the accessible fare selling and collection facility should be marked with a sign displaying the International Symbol of Accessibility. **Section** 3.1.1.1, **Signs,** and **Section 3.1.1.2, Placement of Signs,** describe the requirements for signs.

4.1.4 TURNSTILES AND GATES

All gates that a person in a wheelchair pushes to open must have a smooth continuous (flush) surface extending 25 inches, from 2 inches to 27 inches above the floor. This surface is the area for pushing the gate open and holding it open while maneuvering through the gate (49 ***CFR 37: Section 70.3 of Appendix A).*** A surface that is not smooth and continuous (the bars of a gate, for example) may latch on a part of a wheelchair and prevent the gate from being opened without assistance.

In addition, all gates or entrances at fare collection facilities must comply with all requirements for accessible entrance doors. These requirements include specifications for:

1. Accessible door width;
2. Threshold height;
3. Maneuvering space;
4. Two doors in series;
5. Door hardware;
6. Door opening force; and
7. Automatic doors.

Section 3.2.2, **Doors,** describes the specifications for gates and doors.

4.2 CIRCULATION PATH

The path from the accessible entrance to other accessible features of the transit facility must be accessible to disabled individuals. The floor surface must be even and provide sufficient space, both at the entrance or exit and along the accessible route. Circulation paths within the facility must also be clear of obstructions and must be on a route that coincides with that used by the general public. In addition, a ramp may be necessary depending on the change in height. If the path includes elevators, at least one elevator on an accessible path must be accessible itself, with sufficient maneuvering space and accessible controls.

4.2.1 FLOORS

The areas around the entrance doors to the facility and the gates, doors, or turnstiles for entrance to the transit area must be accessible. The floors must have an even surface for safe maneuvering. The areas must also be wide enough for access by individuals using wheelchairs. The clear space must be adequate for maneuvering, including sufficient headroom so that individuals with vision impairments will not strike their heads.

4.2. 1.1 Even Surface

The surface of the circulation paths and at accessible features should be free of bumps, but should have a texture that provides traction. Changes in level up to 1/2 inch may remain vertical. Changes in level between 1/4 inch and 1/2 inch high must be beveled to a slope of no more than 1:2 Changes in level greater than 1/2 inch must have a ramp ***(49 CFR 37: Section 4.5.2 of Appendix A).*** Figure 3-3 shows guidelines for level changes.

Small vertical changes in level can stop a wheelchair unexpectedly or trip a person. Paving materials such as bricks or concrete blocks should be avoided for accessible pathways, since they often have irregularities exceeding % inch. Even if they are laid to %-inch tolerances, the bumping from rolling on jointed materials can be uncomfortable for people in wheelchairs.

4.2.1.2 Surface Texture

Slip-resistant surfaces must be the choice for floors along accessible paths. The surfaces should remain slip-resistant in both wet and dry conditions and should not require more than normal housekeeping to retain slip-resistance. Slip-resistance is an important factor in choice of flooring materials. Glazed tile or marble would be unwise choices, but unglazed tile or broom-finished concrete would be acceptable.

4.2.1.3 Grates

Grates should be avoided on accessible paths. If they cannot be avoided, their openings must be no greater than 1/2 inch wide in one direction. If the openings are longer in the other direction, the long direction must be perpendicular to the flow of traffic (49 ***CFR 37: Section 4.5.4 of Appendix A***). Small casters on the front of wheelchairs can easily slip into openings more than 1/2 inch long and stop the wheelchair abruptly.

4.2.1.4 Carpet

If a facility has carpeting, the carpet must be firmly attached to the floor surface or ground. A carpet that buckles from use can trip someone walking; it can also stop a wheelchair short, in which case the individual may be thrown from the seat. Also, the carpet must have a firm padding or no padding at all ***(49 CFR 37: Section 4.5.3 of Appendix A).***

The texture of the carpet is important. The requirements are a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum allowable thickness of the pile is 1/2 inch ***(49 CFR 37: Section 4.5.3 of Appendix A).***

The edges of the carpet must be fastened securely to the floor surface. Trim must be installed along the entire length of the carpet edge. The trim must be beveled to a slope no greater than 1:2 if the change in level of the carpet is between 1/4 and 1/2 inch. If the change in level is more than 1/2 inch, a ramp with a maximum slope of 1:2 must be installed.

4.2.2 DIMENSIONS

Within the boundaries of the facility, at least one accessible path must connect all accessible buildings, facilities, spaces, and elements. Within the building, at least one accessible path must connect the accessible entrances with all accessible facilities, spaces, and elements ***(49 CFR 37: Section 4.3.2 of Appendix A).*** **Section 3.1.1.4, Accessible Pathway,** describes requirements for an accessible path.

Although the regulations do not specify how to route the accessible path, the best way is to group accessible elements together as much as possible without moving them from the path of general traffic. Grouping the accessible elements reduces the distances that individuals with disabilities need to travel to use the accessible elements. Grouping the elements also reduces the number of changes involved in creating a number of accessible paths.

4.2.2.1 Sufficient Width

In general, the minimum continuous width of an accessible path is 36 inches. This width is not sufficient for traveling side by side (49 ***CFR 37: Section 4.2.7 of Appendix A).***

A width of 48 inches is wide enough for a person in a wheelchair and a oerson on foot to travel side by side. This width also allows a person on foot to pass the person in the wheelchair.

A path width of 60 inches allows two-wav traffic of individuals in wheelchairs and lets a person in a wheelchair pass another wheelchair. Figure 4-3 **shows** pathway width guidelines.

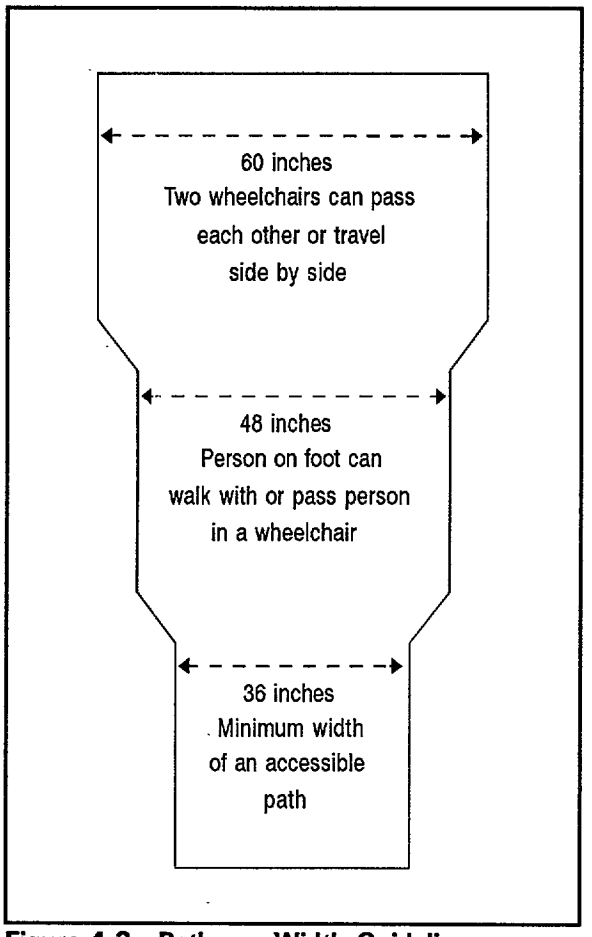


Figure 4-3. Pathway Width Guidelines

A pathway that is less than 60 inches across must include passing spaces at regular intervals. The passing spaces must be at least 60 inches wide and occur at least every 200 feet (*49 CFR 37: Section 4.3.4 of Appendix A*). As an example, an intersection of two paths that widens to 60 inches is a good way to provide a passing space.

The accessible path areas need places where individuals in wheelchairs have space to turn or to reverse their course. For a wheelchair to make a 180-degree turn, the space must be 60 inches in diameter (that is, 60 inches wide in every direction) or T-shaped, with 60

inches of clear space. Figure 4-4 shows the dimensions of these types of turning areas (*49 CFR 37: Section 4.2.3 of Appendix A*).

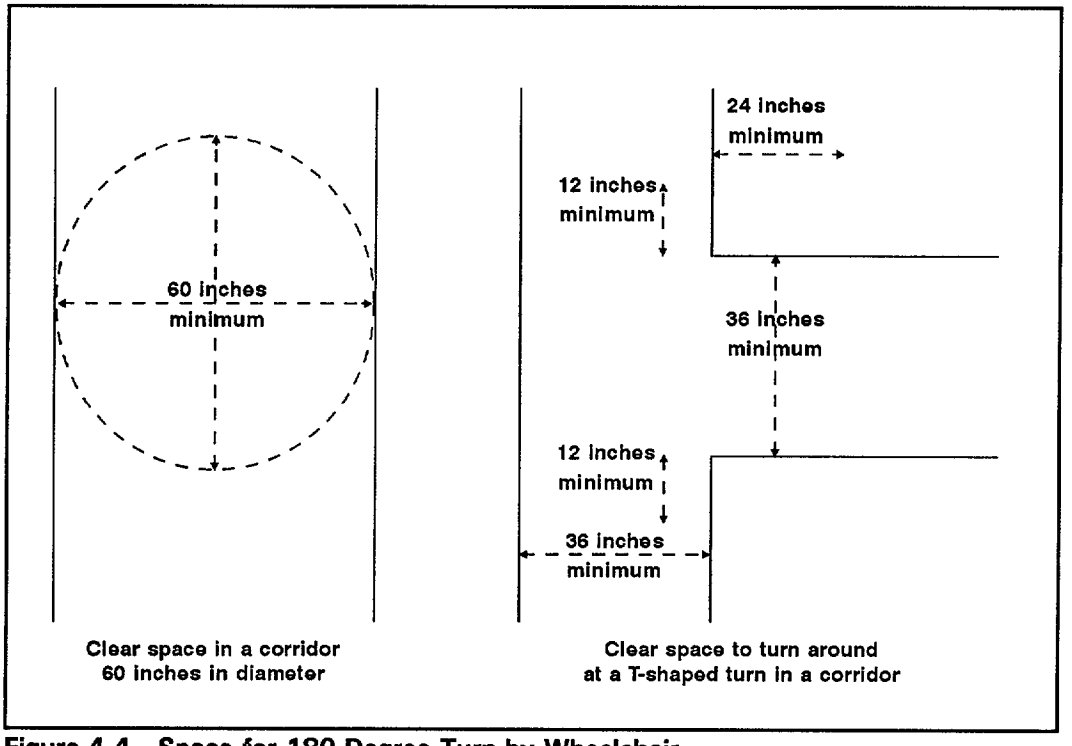


Figure 4-4. Space for 180-Degree Turn by Wheelchair

If the 180-degree is around an obstruction, such as a switchback in a ramp or corridor, or around a column or a post, required dimensions are different. If the obstruction is less than 48 inches wide, the corridor must be at least 42 inches on the approaches to the turn and at least 48 inches at the end of the obstruction where the turn takes place. Figure 4-5 shows these dimensions.

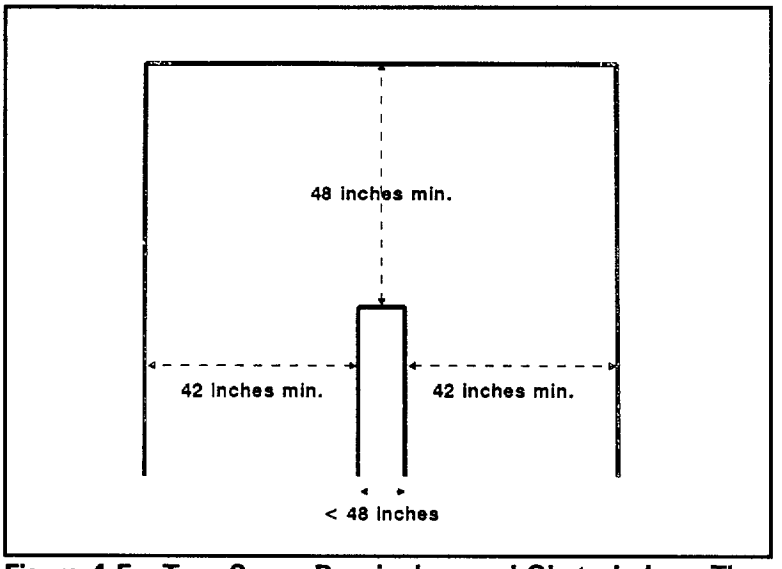


Figure 4-5. Turn Space Required around Obstacle Less Than 48 Inches Wide

If the turn is around an obstacle 48 inches or wider, such as a turn in a corridor, the corridor itself has to be only 36 inches throughout. Figure 4-6 shows these dimensions.

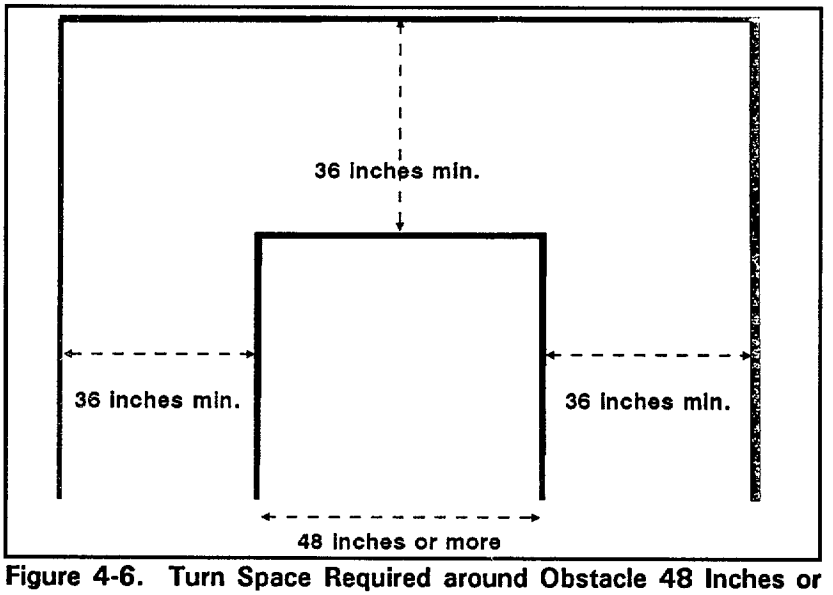


Figure 4-6. Turn Space Required around Obstacle 48 Inches or Wider

4.2.2.2 Obstacles

Objects that obstruct an accessible path cannot reduce the width of the path to less than 32 inches at any point or 36 inches continuously. Such obstacles would include:

1. Curbs;
2. Steps;
3. Changes in level of more than 1/4 inch;
4. Poles or other fixtures that narrow the path;
5. Objects that protrude from walls and narrow the path:
   telephone booths,
   water fountains,
   signs or maps,
   schedules or other information in display racks;
6. Objects that stand in the path, and narrow it:
   trash receptacles,
   planters and other decorative items, or
   newspaper vending machines.

Ensuring that obstructions do not narrow the path too much includes ensuring that they do not become a hazard to persons with vision impairments. For example, a person with vision impairment may not detect objects overhead or protruding from the walls.

Objects Protruding from Walls

Objects that are mounted on the wall must be detectable by a person using a cane. An individual sweeping a cane back and forth can detect a mounted object if its leadina edae is less than 27 inches above the floor. Thus, an object with those requirements can protrude any

amount into the path, as long as it does not reduce the path width to less than 36 inches continuously or 32 inches at any point (49 ***CFR 37: Section 4.4.1 of Appendix A).***

If the object is mounted on the wall so that its leading edge is between 27 and 80 inches from the floor, it can protrude a maximum of 4 inches ***(49 CFR 37: Section 4.4.7 of Appendix A).***

Objects that are mounted so that the leading edge is more than 80 inches above the floor can protrude any amount and hang over an accessible path.

Figure 4-7 shows the necessary placement of objects on walls.

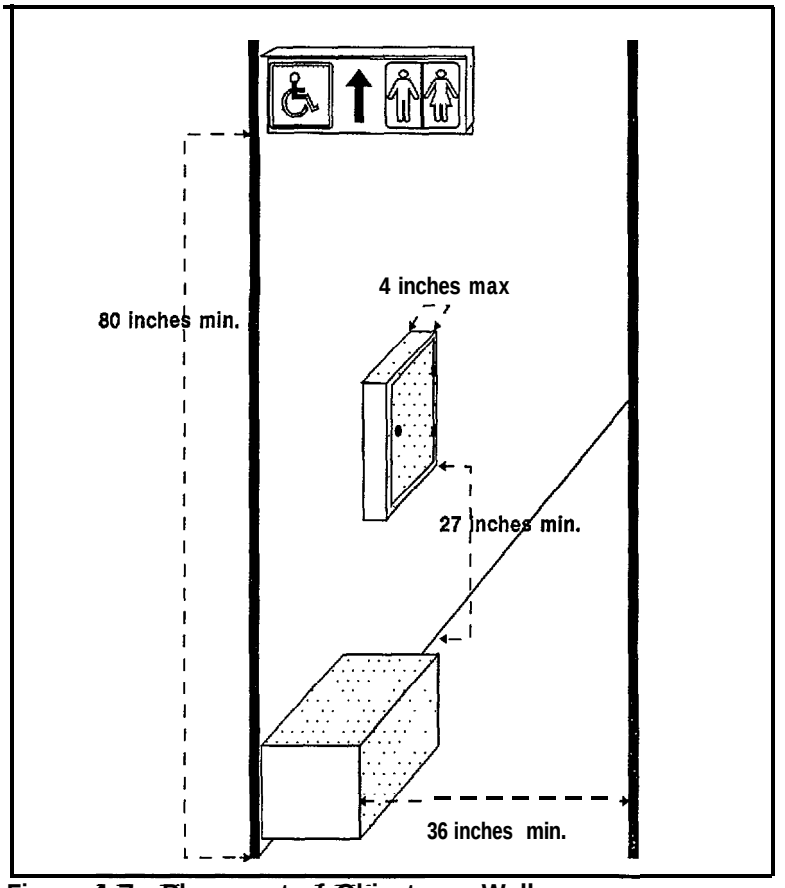


Figure 4-7. Placement of Objects on Walls

Overhead Objects

Similarly, objects that hang over an accessible path must hang more than 80 inches from the floor. Low ceilings, low doorways, and areas under steps cannot be part of an accessible path (49 ***CFR 37: Section 4.4.2 of Appendix A).*** In addition, if such areas are adjacent to an accessible path, they must be screened so that people with vision impairments do not strike them ***(49 CFR 37: Section 4.4.2 of Appendix A).*** Some alternatives for screening such areas from a person with vision impairment using a cane are:

1. A barrier mounted less than 27 inches in height;

2. A planter or other object under stairs, so that it is detectable from the ground;

3. Wing walls around objects;

4. An alcove around objects; and

5. Objects on poles that can be detected close to the floor.

Free-standing Objects

Objects may be mounted on posts or pylons. If the objects are mounted between 27 inches and 80 inches above the floor, they may protrude up to 12 inches from the posts. The posts themselves would be detectable by those using a cane, thus preventing them from hitting the objects ***(49 CFR 37: Section 4.4.7 of Appendix A).***

4.2.2.3 Accessible Path versus General Public Path

The accessible path used by persons with disabilities must coincide as much as possible with the route taken by all passengers through the facility ***(49 CFR 37: Section 4.3.2 of Appendix A).*** At the same time, the path should minimize the distances that passengers with

disabilities will have to travel to circulate through the facility (49 ***CFR 37: Section 10.3. 1 of Appendix A).***

It is important to avoid creating detours for passengers with disabilities. If, for example, a single accessible path leads from the accessible entrance, to the ticket vending booth, and then to the station platform, a person who does not need to purchase a ticket should not have to take the path to the ticket vending booth. A facility should have an alternative accessible route directly to the station platform, or the ticket booth should be located along the direct path between the entrance and the platform, for the convenience of all passengers.

In order to keep the accessible route similar to that used by the general public, as much of the facility as possible should be accessible- given space and structure constraints. Entrances, fare collection facilities, bathrooms, telephones, and vending areas, for example, can be made uniformly accessible. Elevators and ramps cannot be in the same location as the stairs, but can be as close as possible to the general route through the station.

4.2.3 STAIRS AND RAMPS

The requirements for stairs and ramps differ, for example, in wheelchair accessibility.

4.2.3.1 Stairs

Terminals, depots, or other stations must have an elevator to serve each level in multistory buildings ***(49 CFR 37: Section 4. 7.3 of Appendix A).*** Such facilities are not subject to exemptions from the requirement for accessible elevators ***(49 CFR 37: Section 10.3.1 of Appendix A).*** Although stairs are not an accessible path of travel for wheelchairs, stairs should be as accessible as possible for other people's use.

Steps

The steps on flight of stairs must be uniform in size; that is, the risers must be of the same height and the treads of the same width on each step ***(49 CFR 37: Section 4.9.2 of Appendix A).*** Persons with vision impairments can thus move more easily on the steps because they can anticipate the location of each step.

The minimum width for a stair tread is 11 inches, measured from riser to riser. Open risers are not permitted ***(49 CFR 37: Section 4.9.2 of Appendix Al.***

The leading edge, or nosing, of the step must not trip **a** person by extending too far or too sharply. The nosings on the steps must project no more than 1% inches ***(49 CFR 37: Section 4.9.3 of Appendix A).*** Figure 4-8 shows typical dimensions of stair treads and nosings.

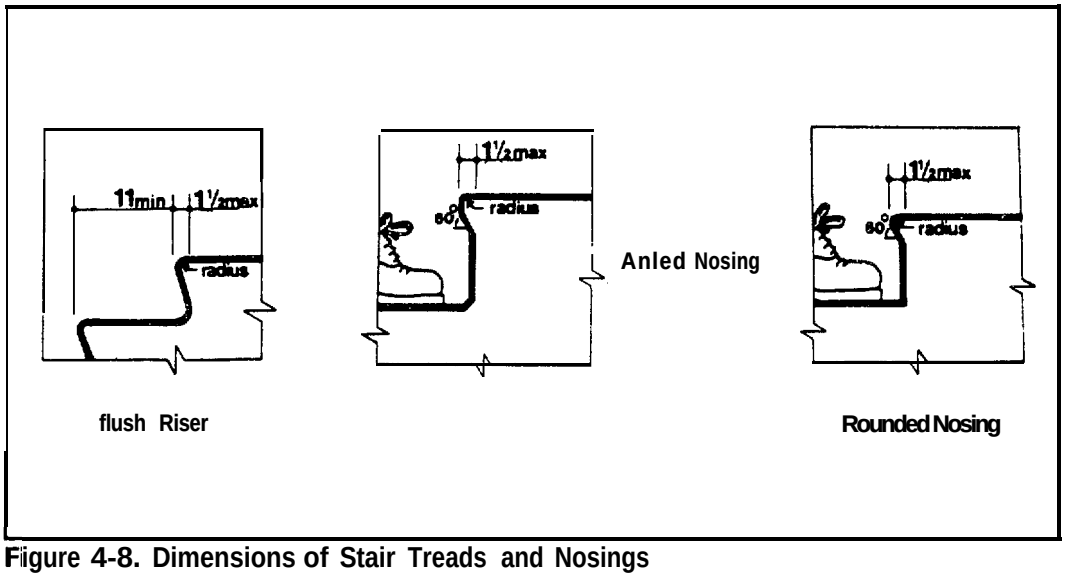


Figure 4-8. Dimensions of Stair Treads and Nosings

Handrails

An important feature for increasing the accessibility of stairs is handrails. All stairs must have handrails on both sides (49 ***CFR 37: Section 4.9.4 of Appendix A).***

The size, shape, and placement of handrails must make them easy to use. The handrails must provide a gripping surface between 1¼ and 1½ inches in width or diameter (*49 CFR 37: Section 4.26.2 of Appendix A*).

If the handrail is mounted on a wall, or is placed adjacent to a wall, the distance between the wall and the gripping surface of the grab bar must be 1½ inches. The handrail can be located in a recess in a wall. The recess can be up to 3 inches deep and must extend at least 18 inches above the top of the handrail (*49 CFR 37: Section 4.26.2 of Appendix A*). Figure 4-9 shows the dimensions of typical handrails.

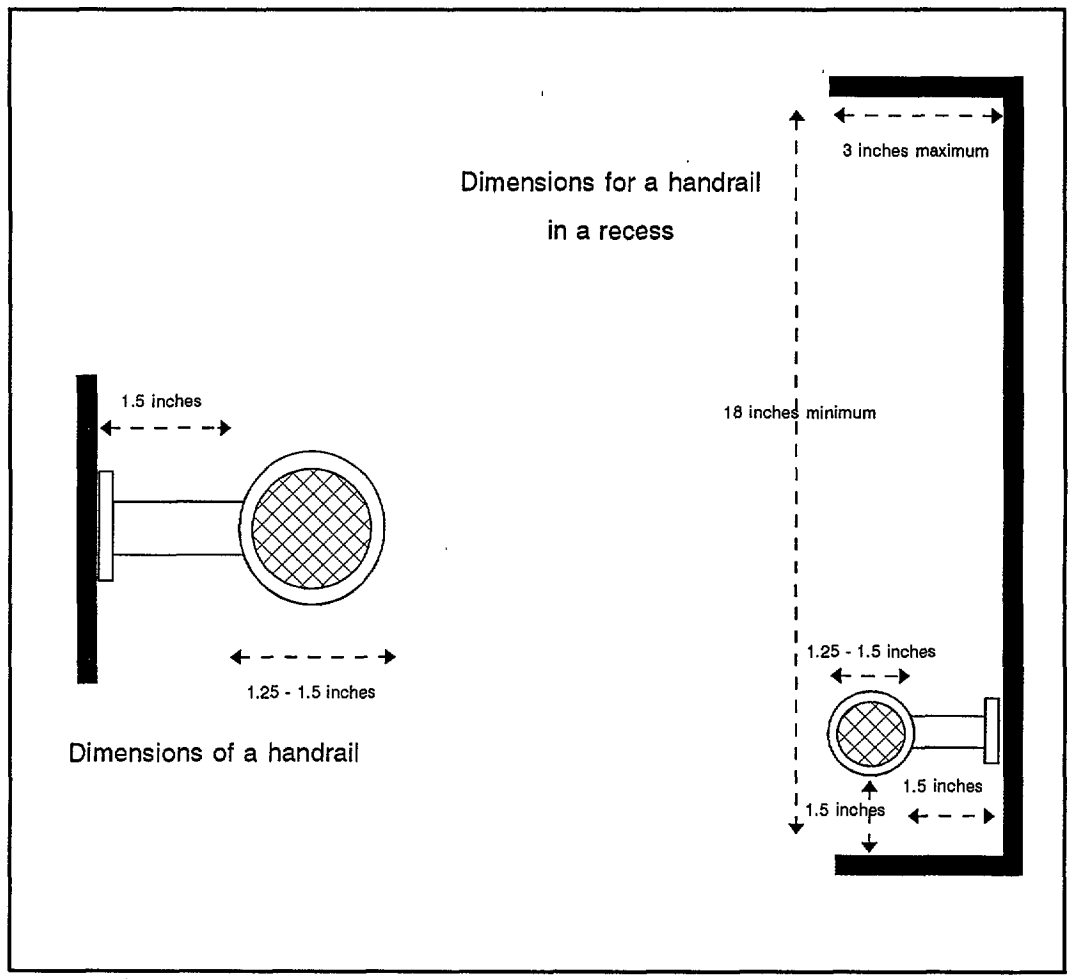


Figure 4-9. Handrail Dimensions

Handrails must also be structurally strong enough to withstand use. The material, mounting device, and mounting structure must be able to withstand the application of 250 pounds of force, as direct, torsional, bending, or combined shear stress (49 CFR 37: Section 4.26.3 ***of Appendix A).***

The grab bars must not rotate in their fittings because this movement could pose a hazard to someone relying on the handrail for assistance. The stability of the grab bar in the fittings may be a maintenance issue as well as an installation issue **(49 CFR 37: Section *4.26.3 of Appendix A).***

Hazards, such as sharp edges or abrasive surfaces, cannot exist around the handrails. Any hazards on the handrail or adjacent surfaces must be removed. Edges must have a minimum radius of 1/8 inch (49 CFR ***37: Section 4.26.4 of Appendix A).***

Handrails must be continuous along both sides of the stairs. The inside handrail on switchback or dogleg stairs must always be continuous, even at landings ***(49 CFR 37: Section 4.9.4 of Appendix A).***

Where handrails are not continuous, they must extend beyond the stairs. At the top of the stairs, the handrail must extend at least 12 inches beyond the top riser. The extension must be parallel with the floor ***(49 CFR 37: Section 4.9.4 of Appendix A).***

At the bottom of the stairs, the handrail must extend 12 inches plus one tread width beyond the bottom riser. For example, the total is 23 inches if the treads are 11 inches wide. The extension at the bottom must continue the slope for a distance of one tread width, then run parallel with the floor for the remaining 12 inches (49 ***CFR 37: Section 4.9.4 of Appendix A).*** Figure 4-10 shows extended handrails.

The handrails must be mounted so that the top of the gripping surface is between 34 and 38 inches from the step nosings (49 ***CFR 37: Section 4.9.4 of Appendix A).***

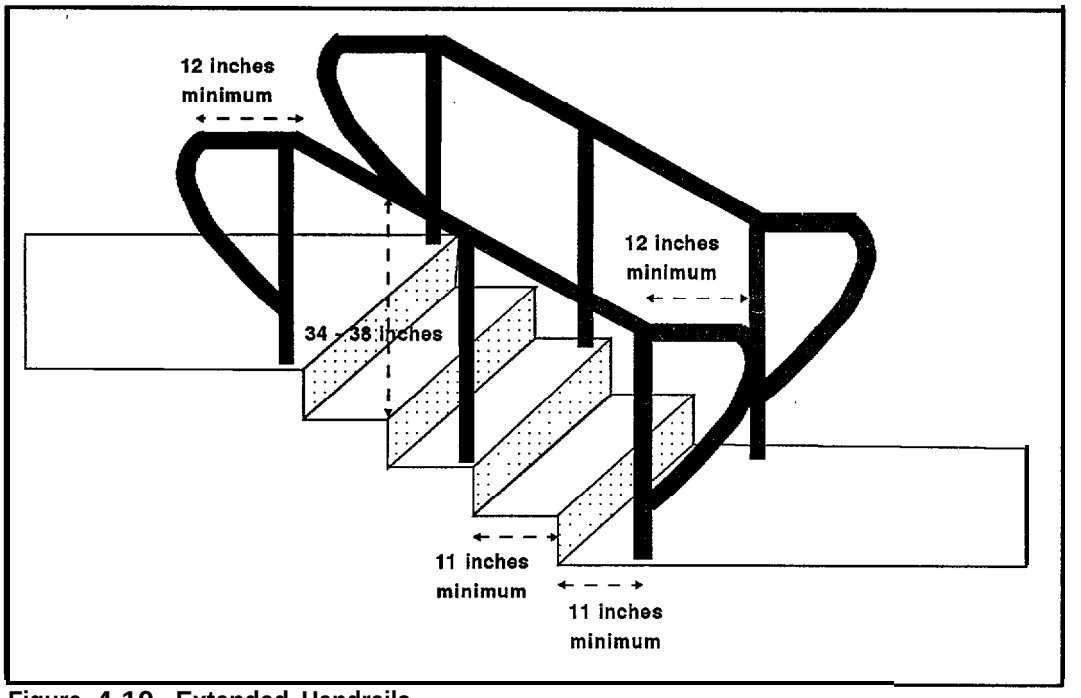


Figure 4-10. Extended Handrails

Handrail extensions must be designed for detection by a person who has a visual impairment and uses a cane. They must also not reduce the maneuvering space for individuals in wheelchairs.

The handrails must not be interrupted by obstructions such as newel posts or other elements. The ends of the handrail must be rounded or returned smoothly to their mountings in the wall, floor, or post ***(49 CFR 37: Section 4.9.4 of Appendix A).***

4.2.3.2 Ramos

If the accessible path of travel crosses stairs, the path must also have a ramp for wheelchair travel. Any change in level greater than 1/2 inch needs a ramp ***(49 CFR 37: Section 4.3.8 of Appendix A).*** Any

part of the path that has a slope greater than 1:20 also requires a ramp ***(49 CFR 37: Section 4.8.1 of Appendix A).*** **Section 3.1.16, Ramps,** describes ramp requirements.

4.2.4 ELEVATORS AND ESCALATORS

The requirements for accessible elevators and escalators are different; for example, escalators are not accessible to individuals in wheelchairs.

4.2.4.1 Elevators

Elevators for use by individuals in wheelchairs or others who need this assistance must be on an accessible route. Freight elevators cannot be accessible elevators unless the only elevators provided for use by the public and employees are combination passenger and freight elevators ***(49 CFR 37: Section 4.10.1 of Appendix A).***

In addition to requirements for accessibility, accessible elevators must also comply with ASME Al 7. l-l 990, Safety Code for Elevators and Escalators (49 ***CFR 37: Section 4.10.1 of Appendix A).***

Features of elevators that must be considered are:

1. Automatic elevator operation;
2. Call buttons and indicator lights;
3. Raised letters and Braille;
4. Door timing and door reopening device;
5. Elevator floor space and surface;
6. Car controls; and
7. Emergency communications.

Automatic Elevator Operation

An accessible elevator equipped with a self-leveling device automatically brings the car level with the floor landing. The elevator car must be level with the lobby floor within 1/2- inch vertical distance. The elevator must level to this tolerance at every loading condition between zero loading and the rated loading condition. The self-leveling device must be independent of the operating device (49 ***CFR 37: Section 4.10.2 of Appendix A).***

Call Buttons and Indicator Lights

The buttons that passengers use to call the elevator and the lights that indicate the arrival of the elevator must be accessible to individuals in wheelchairs as well as to those with hearing or visual impairments.

The call button must be centered at 42 inches above the floor. The button must also have a visual signal (such as a light) to indicate that the call is registered and when the call is answered. The buttons must be at least 3/4 inch in the smaller dimension.. The button that designates the up direction must be above the down button (49 ***CFR 37: Section 4.10.3 of Appendix A).***

The buttons may be either raised or flush. However, objects that project more than 4 inches into the hallway must never be mounted beneath the call buttons.

The indicator lights must provide both a visual and audible signal that the elevator is answering the call. Each elevator entrance must have an indicator signal.

A person with visual impairments must be able to determine whether the elevator signaled will be going up or down after it stops. One way to distinguish the up and down signals is for the audible signal to ring once for the up direction and twice for the down direction. In addition, verbal annunciators can say “up” or “down” when the elevator answers the call ***(49 CFR 37: Section 4.10.4 of Appendix A).***

The lanterns for the indicator lights must be mounted so that their centerline is 72 inches from the floor. They will need to be larger than the call buttons; that is, the smaller dimension must be at least 2% inches. Also, the indicator lights must be visible from the vicinity of the hall call buttons, so that a person who has called an elevator does not need to move to determine when and whether the elevator has responded. An acceptable alternative is in-car lanterns that are visible from the vicinity of the hall call buttons and conform to the height, size, and signaling requirements.

Raised Letters and Braille

Both Braille and raised-letter floor designations must be provided on both jambs of the elevator door. For the floor designations, the centerline of the letters must be 60 inches above the floor, and the letters must be 2 inches high ***(49 CFR 37: Section 4.10.5 of Appendix A).*** Raised letters must be raised l/32 inch and uppercase in a sans serif or simple serif font and accompanied by Grade 2 Braille (49 ***CFR 37: Section 4.30.4 of Appendix A).***

Door Timing and Door Reopening Device

The time that an elevator door must remain open depends on its distance from the hall call button. When the elevator is opening to let someone in, the minimum time under any circumstances is 5 seconds. The amount of time that the elevator door must remain open can be calculated using the following formula:

$$\text{Time} = \frac{\text{Distance}}{1.5 \text{ ft/sec}}$$

The Time is the minimum number of seconds between the notification that a car is answering a call until the doors of that car start to close. The Distance is the number of feet from a point in the lobby 60 inches directly in front of the farthest call button controlling that car to the centerline of the elevator door (49 ***CFR 37; Section 4.10.7 of Appendix A).***

For example, if the distance from the point in the lobby is 30 feet, the minimum amount of time is:

$$\frac{30 \text{ ft.}}{1.5 \text{ ft./sec}} = 20 \text{ seconds}$$

Table 4-1 shows various acceptable minimum times from car arrival notification until the doors start to close.

Table 4-l. Notification-to-Door-Close Times

Distance in Feet	Time in Seconds (Minimum)
5	5
10	7
15	10
20	14
25	17
30	20
35	24
40	27

The elevator door must be equipped with a device that automatically stops and reopens the door if the door is obstructed by an object. Thus, the device must also be able to stop and reopen the door without having to contact an object that is between 5 and 29 inches above the floor. Once the doors have been reopened by such a device, they must remain open for at least 20 seconds before closing again (49 ***CFR 37: Section 4. 10. 6 of Appendix A).***

For cars with in-car lanterns, Time begins when the lantern is visible from near the hall call button and the audible signal is activated.

When the elevator is opening to let someone out, the minimum amount of time for the elevator car doors to remain open is 3 seconds ***(49 CFR 37: Section 4. 10. 8 of Appendix A).***

Elevator Floor Space and Surface

The interior of an elevator car must provide sufficient space for a person in a wheelchair to enter the car, maneuver to reach the controls, and exit the car. The door openings must be at least 36 inches wide. There must be at least 54 inches from the door to the rear of the elevator and at least 51 inches from the front wall of the elevator to its rear wall ***(49 CFR 37: Section 4.10.9 of Appendix A).***

If the elevator door opens in the center of the elevator wall, the elevator must be at least 80 inches wide. If the door opens close to the corner of the elevator, the minimum width is 68 inches (49 ***CFR 37: Section 4.70.9 of Appendix A).*** An elevator car in which a 60-inch diameter circle can be inscribed is also permitted ***(49 CFR 37: Section 10.3. I of Appendix A).***

The surface of the floor of the elevator should be free of bumps, but have a texture that provides traction. Small vertical changes in level can stop a wheelchair unexpectedly or trip a person on crutches. In addition, slip-resistant surfaces must be used for elevator floors. The surfaces should remain slip-resistant in both wet and dry conditions and should not require more than normal housekeeping to retain slip-resistance ***(49 CFR 37: Section 4.5.2 of Appendix A).***

If the elevator has carpeting, the carpet must be firmly attached to the floor surface. If a carpet has buckled from use, someone walking can trip and a wheelchair can stop short, in which case the individual may be thrown from the seat. Also, the carpet must have a firm padding or no padding at all ***(49 CFR 37: Section 4.5.3 of Appendix A).***

The texture of the carpet is important. It must have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The

maximum allowable thickness of the pile is 1/2 inch ***(49 CFR 37: Section 4.53 of Appendix A).***

The edges of the carpet must be fastened securely to the floor surface. Trim must be installed along the entire length of the carpet edge.

The illumination of the car controls, platform, and car threshold and landing sill must be at least 5 foot candles (53.8 lux). Passengers should have enough illumination for safe maneuvering in the elevator and into and out of it ***(49 CFR 37: Section 4.10.11 of Appendix A).***

The horizontal space between the car and the floor at any landing can be no greater than 1% inches ***(49 CFR 37: Section 4.10.9 of Appendix A).***

Elevators must be glazed ***(49 CFR 37: Section 10. 3.1 of Appendix A)*** or have transparent panels.

Car Controls

The controls of an accessible elevator must meet the specifications for the following **features:**

1. Button size;
2. Tactile and visual control indicators;
3. Button height;
4. Panel location; and
5. Car position indicators.

Button size. The control buttons must be at least 3/4 inch in the smaller dimension. They must be raised or flush.

Tactile, Braille, and Visual Control Indicators. All the control buttons must be designated by Braille and raised standard alphabet letters, Arabic numerals, and other symbols as required. The designations on the car controls must be placed immediately to the left of the control button and conform to the following specifications:

1. The background should contrast well with the letters and designs: either dark on light or light on dark (49 ***CFR 37: Section 4.30.5 of Appendix A).***

2. The finish should be matte or another nonglare finish (49 ***CFR 37: Section 4.30.5 of Appendix A).***

3. Obstacles in front must not prevent people from standing as close as 3 inches away to read the control button descriptions ***(49 CFR 37: Section 4.30.6 of Appendix A).***

4 Letters and numbers must be raised 1/32 inch and accompanied with Grade 2 Braille ***(49 CFR 37: Section 4.30.4 of Appendix A).***

5. Raised characters must be from 5/8 inch high to 2 inches high, ***(49 CFR 37: Section 4.30.4 of Appendix A).***

The main entry floor is designated by a raised star at the left of the floor designation. The main entry floor is the main floor with an accessible entrance ***(49 CFR 37; Section 4.10.12 of Appendix A).*** An accessible entrance on another floor could be indicated with the International Symbol of Accessibility.

Floor buttons must include a visual indication that the call is registered; the visual indication should go out when the call is answered ***(49 CFR 37: Section 4. 10. 12 of Appendix A).***

Button Height. The floor buttons must be no higher than 54 inches above the floor for a side approach in a wheelchair. If the elevator is

designed so that the rider approaches the control buttons from the front, the control buttons can be no higher than 48 inches from the floor.

The best choice for emergency controls, including the emergency stop button, is to group them at the bottom of the panel. The centerline of any emergency button must be at least 35 inches from the floor (*49 CFR 37: Section 4.10.12 of Appendix A*). Figure 4-11 shows a typical elevator control panel.

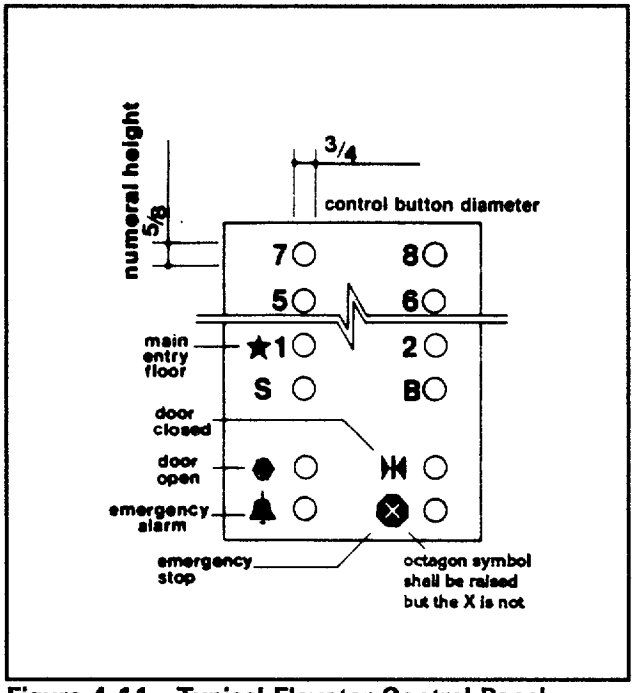


Figure 4-11. Typical Elevator Control Panel

Panel Location. The location of the car control panel depends on whether the elevator door is in the center of the wall or to the side. If the door opens in the center, the controls should be located on the front wall, on either side of the door. If the door opens to the side, the control panel can be located on the front wall next to the door or on the side wall that is closest to the door (*49 CFR 37: Section 4.10.12 of Appendix A*). If the elevator cab is designed so that a person enters through a door on one wall and exits through a door on the opposite wall, the best place for the controls is on the side wall.

Car Position Indicators. Elevators must include a car position indicator in the car: above the car control panel or over the door. As the car passes or stops at each floor, the floor number, at least 1/2 inch high must light up an audible signal at least 20 decibels and with a frequency no higher than ***1500*** Hz ***(49 CFR 37: Section 4.10.13 of Appendix A)*** must also be triggered.

An alternative for the car position indicator is an automatic verbal announcement of each floor number as the car passes it or stops (49 ***CFR 37: Section 4.10.13 of Appendix A).***

Emergency Communications

If the elevator has an emergency communication system, all its operable features must be less than 48 inches from the floor. This system must be identified by a raised symbol and lettering. If the system uses a handset, the cord from the panel must be at least 29 inches in length ***(49 CFR 37: Section 4.10.14 of Appendix A).*** A person must be able to use the communication system without voice communication ***(49 CFR 37: Section 4.10.14 of Appendix A).***

If the emergency communication equipment is located in a closed compartment, a person must be able to open it with one hand. Operating the system must not require tight grasping, pinching, or twisting of the wrist or a force no greater than 5 pounds (49 ***CFR 37: Section 4.27.4 of Appendix A).***

4.2.4.2 Escalators

Although not accessible to people in wheelchairs, escalators in a facility must be accessible to people with other impairments.

New escalators at below-grade stations must have a clear width of at least 32 inches. At the top and bottom of each escalator run, the escalator must operate so two continuous treads are level before they go under the comb plate ***(49 CFR 37: Section 70.3.7 of Appendix A).***

The edge of each of the escalator treads must be marked by **a** strip of contrasting color that can be seen from both the top and the bottom of the run. The strip must be 2 inches wide, placed parallel to the nose, and also placed right at the step nose. The strip material must be at least as slip-resistant as the rest of the tread ***(49 CFR 37: Section 10.3.2 of Appendix A).***

4.3 OTHER ELEMENTS

4.3.1 SIGNS

Everyone, including individuals with disabilities, should be able to read and understand the signs in a transit facility. Well-placed signs will point out the facility's accessible features for people who need to use them. Signs should clearly identify all major features of the facility, such as the location of platforms and ticket sales. **Section 3.1 .1.1, Signs,** and **Section 3.1 .1.2, Placement of** Signs, describe the requirements for signs.

4.3.2 PUBLIC ADDRESS SYSTEMS

If the transit system uses a public address system for announcements to passengers in terminals, stations, or other fixed facilities, it needs a means for conveying the same information to individuals with hearing impairments ***(49 CFR 37: Section 10.3.1 of Appendix A).*** The choice for conveying the information visually might be a closed-circuit monitor or a moving message display system.

4.3.3 TELEPHONES

If one or more telephones are for public use in a new facility, at least one accessible telephone must be available on each floor (49 ***CFR 37: Section 4.1.3 of Appendix A).***

If a new facility has two or more banks of telephones, at least one accessible telephone must be available for each bank. (A bank of telephones is defined as two or more adjacent telephones, usually installed as a unit.) At least one public telephone must meet the

requirements for a forward-reach telephone ***(49 CFR 37: Section 4.1.3 of Appendix A).***

4.3.3.1 Design of Accessible Telephones

An accessible telephone must have enough space in front to maneuver a wheelchair. The operable parts (for example, coin slots, dial, and change return) must be within the reach of individuals in wheelchairs.

The minimum floor space for a wheelchair is 30 x 48 inches. Since the clear space may be rectangular, the space can be oriented so that the wheelchair is either facing the telephone or parallel to it (49 ***CFR 37: Section 4.2.4.1 of Appendix A).*** The clear floor space for a wheelchair at an accessible telephone must adjoin or overlap an accessible route, or adjoin another clear floor space that can accommodate a wheelchair ***(49 CFR37: Section 4.3.4.2 of Appendix A).***

The location of the telephone book for the accessible telephone must conform to the reach ranges for phone controls (49 ***CFR 37: Section 4.3.1.7 of Appendix A).***

All accessible telephones, and 25% of all other telephones, must be equipped with controls for adjusting the volume from 12 decibels to **18** decibels above the noise level of the surroundings (49 ***CFR 37: Section 4.31.5 of Appendix A)*** so that individuals with hearing difficulties can adjust the volume for their use.

The accessible telephones must have push-button controls (49 ***CFR 37: Section 4.31.6 of Appendix A).*** The cord of the telephone handset must be at least 29 inches in length ***(49 CFR 37: Section 4.31.8 of Appendix A).***

Section 4.1.2.2, Controls Location, and **Section 4.1.2.3, Controls Operation,** describe the requirements for the location of telephone controls.

4.3.3.2 Text Telephones

Text telephones (also known as TDDs) allow individuals with hearing impairments to communicate over the telephone. Where text telephones are required, they may be permanently connected. As an alternative, a portable device can be available at all times and, at the same locations that a fixed device would otherwise be provided.

Text telephones used in conjunction with a public pay telephone must be permanently fixed within or adjacent to the telephone enclosure. If an acoustic coupler is used, the cord must be long enough to connect the text telephone and the telephone receiver (49 ***CFR 37: Section 4.31.9 of Appendix A).***

Pay telephones designed to accommodate a portable text telephone must include, a shelf for the text telephone. The.shelf must have at least 6 inches vertical clearance above it ***(49 CFR 37: Section 4.31.9 of Appendix A).***

An electrical outlet must be located in or adjacent to the telephone enclosure. The telephone handset must be able to lie flush on the shelf ***(49 CFR 37: Section 4.3 1.9 of Appendix A).***

If pay phones are provided, at least one must accommodate the portable text telephone, which must be near the telephones and available when the pay phones are available: 24 hours a day if that part of the facility is open 24 hours a day ***(49 CFR 37; Section 4.31.9 of Appendix A).***

The regulations for text telephones in altered facilities are slightly different ***(49 CFR 37: Section 4.1.6 of Appendix A).*** The facility must have at least one text telephone located inside if: before alterations, it had at least four telephones, including one inside; or after alterations, it has at least four telephones, including one inside.

If an interior pay telephone is provided in a transit facility, at least one public pay text telephone must be provided. Where four or more public pay telephones serve an entrance, and one is interior, at least one public text telephone must serve that entrance.

4.3.4 RESTROOMS

If a facility has public or common use (e.g., employee) toilets, each must be accessible. The rooms for all toilet facilities must be accessible as well (49 ***CFR 37: Section 4.1.2 of Appendix A).*** If it is not technically feasible to make all restrooms accessible during alterations to a building, at least one restroom on each floor must be accessible (49 ***CFR 37: Section 4.1.6 of Appendix A).***

4.3.4.1 Toilets

To be accessible, the toilets of public and common use restrooms must meet accessibility standards for the following features:

1. Clear floor space;
2. Height;
3. Grab bars;
4. Flush controls; and
5. Toilet paper dispensers.

Clear Floor Space

Clear floor space around the toilet must be sufficient for a person to move within the area, position themselves, and move into and out of a wheelchair.

The size and configuration of the clear floor space in the room depends on where the toilet is placed and whether the clear space is arranged for a right-handed or a left-handed approach. Different floor space is needed for toilets in stalls.

Approach from Front. For toilets in rooms that a person approaches from the front, the room must be a minimum of 66 inches deer, and 48 inches wide ***(49 CFR 37: Section 4.16.2 of Appendix A).*** Figure 4-12 shows these dimensions.

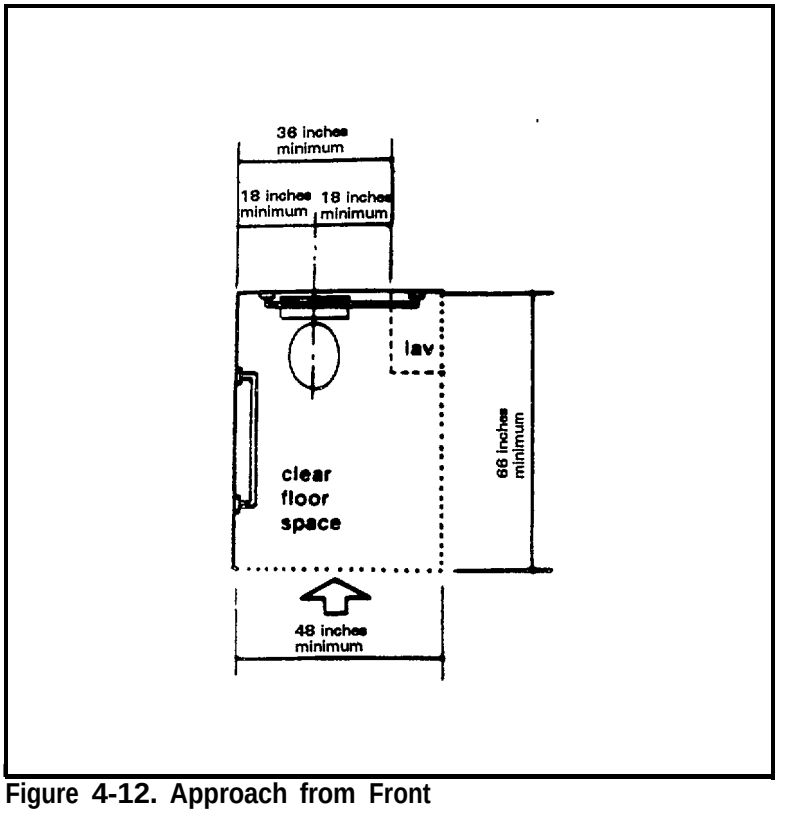


Figure 4-12. Approach from Front

Approach from Right Side. For toilets that a peisan approaches from the right side, the room must be a minimum of 56 inches deep and a minimum of 48 inches wide ***(49 CFR 37: Section 4.16.2 of Appendix A).*** Figure 4-13 shows these dimensions.

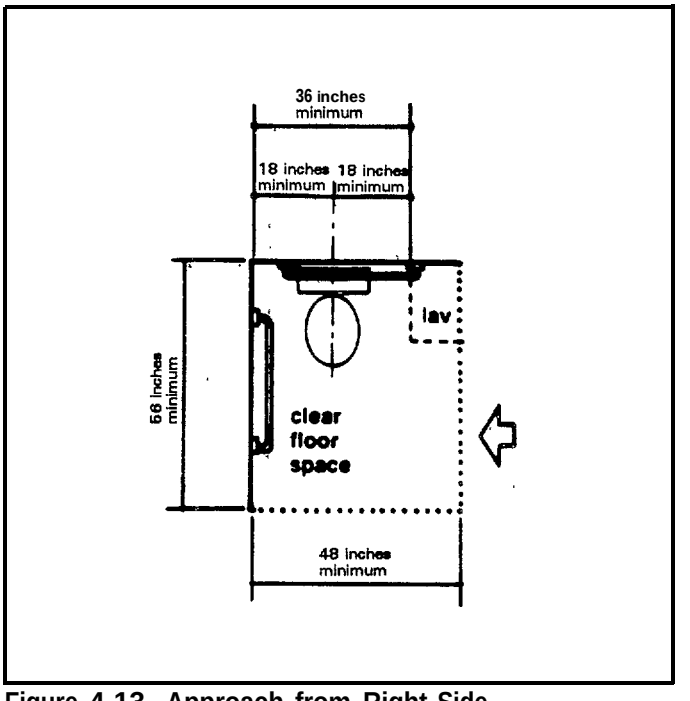


Figure 4-13. Approach from Right Side

Approach from Left Side. For toilets that a person approaches from the left side, the room must be a minimum of 56 inches deep and a minimum of 60 inches wide (*49 CFR 37: Section 4.16.2 of Appendix A*). Figure 4-14 shows these dimensions.

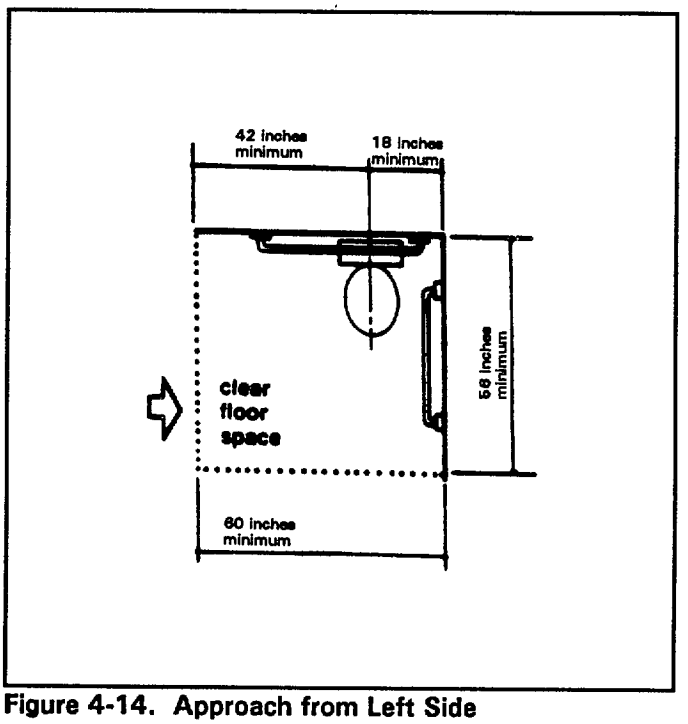


Figure 4-14. Approach from Left Side

Height

The top of the toilet seats must be 17 to 19 inches from the floor ***(49 CFR 37: Section 4.16.3 of Appendix A).***

Grab Bars

The grab bars in the room must be on the wall next to the toilet and behind it. The bars must be mounted between 33 and 36 inches from the floor. The grab bar on the wall beside the toilet must be mounted 12 inches away from the wall behind the tank and must be at least 42 inches long ***(49 CFR 37: Section 4.16.4 of Appendix A).*** Figure 4-l 5 shows these dimensions.

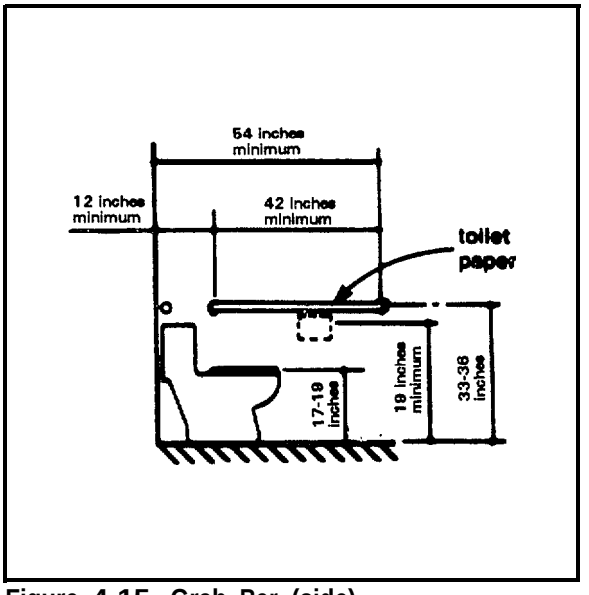


Figure 4-15. Grab Bar (side)

The grab bar behind the tank must be mounted at least 12 inches away from the wall on either side and must be at least 36 inches long (*49 CFR 37: Section 4.16.4 of Appendix A*). Figure 4-16 shows the dimensions for the grab bar mounted on the wall behind the tank.

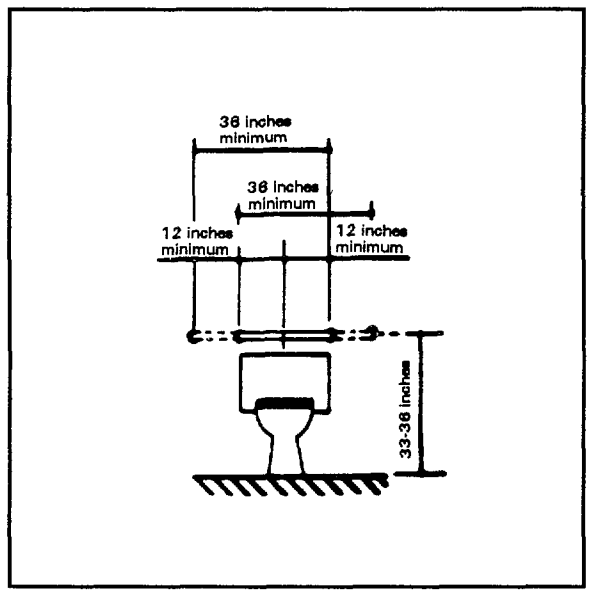


Figure 4-16. Grab Bar (back)

The grab bars must meet the requirements for handrails (*49 CFR 37: Section 4.26 of Appendix A*). In the size and shape of grab bars, ease of use is an important factor. The grab bars must provide a gripping surface between 1¼ and 1½ inches in width or diameter (*49 CFR 37: Section 4.26.2 of Appendix A*).

Grab bars for toilets are usually mounted on a wall. There must be 1½ inches between the wall and the gripping surface of the grab bar. The grab bar may be located in a recess in a wall. The recess can be up to 3 inches deep and must extend at least 18 inches above the top of the grab bar (*49 CFR 37: Section 4.26.2 of Appendix A*). Figure 4-10 shows the dimensions of typical grab bars.

The material, mounting device, and mounting structure of grab bars must be structurally strong enough to withstand the application of 250 pounds of force, as direct, torsional, bending, or combined shear stress ***(49 CFR 37: Section 4.26.3 of Appendix A).***

The grab bars cannot rotate in their fittings because this motion could pose a hazard to someone relying on them for support. The stability of the grab bar in the fittings may be a maintenance issue as well as an installation issue ***(49 CFR 37: Section 4.26.3 of Appendix A).***

Flush Controls

The flush controls on accessible toilets can be hand-operated or automatic. The location of the flush controls must conform to the requirements for controls and operating mechanisms (49 ***CFR 37: Section 4.16.5 of Appendix A).*** Flush controls must be on the open side of the toilet.

A room with a toilet must be designed to reduce the need for maneuvering as much as possible; for example, a person has to move to a certain position to reach the controls. In addition, the nature of the room presents a large obstacle-the toilet-in the vicinity of the flush controls.

For a person in a wheelchair approaching the toilet from the front, the flush controls must be 15 inches from the floor. The maximum heiaht for the flush controls is 44 inches from the floor (49 ***CFR 37: Section 4.16.5 of Appendix A*** *).*

Toilet Paper Dispensers

Toilet paper dispensers must be mounted within reach of the toilet. The centerline of the dispenser must be at least 19 inches from the floor. Dispensers must not control delivery of the paper or prevent continuous flow of paper (49 ***CFR 37: Section 4.76.6 of Appendix A).***

4.3.4.2 Toilet Stalls

Toilet stalls must be available on an accessible route, and the following features must be accessible to persons with disabilities:

1. Toilets;
2. Sizes and arrangements;
3. Toe clearances;
4. Doors; and
5. Grab bars.

Toilets

The toilets in the toilet stalls must comply with the requirements described in **Section 4.3.4.1, Toilets *(49 CFR 37: Section 4.17.2 of Appendix A).***

Sizes and Arrangements

Provision of at least one standard stall is required in new construction. Figure 4-17 shows a configuration for a standard toilet stall. This arrangement can be reversed for an approach from the other side of the toilet. The minimum allowable depth of a stall is 56 inches. Stalls that are 56 to 59 inches deep must be provided with wall-mounted toilets. Toilets in stalls that are 59 inches or more deep may be mounted on either the wall or the floor.

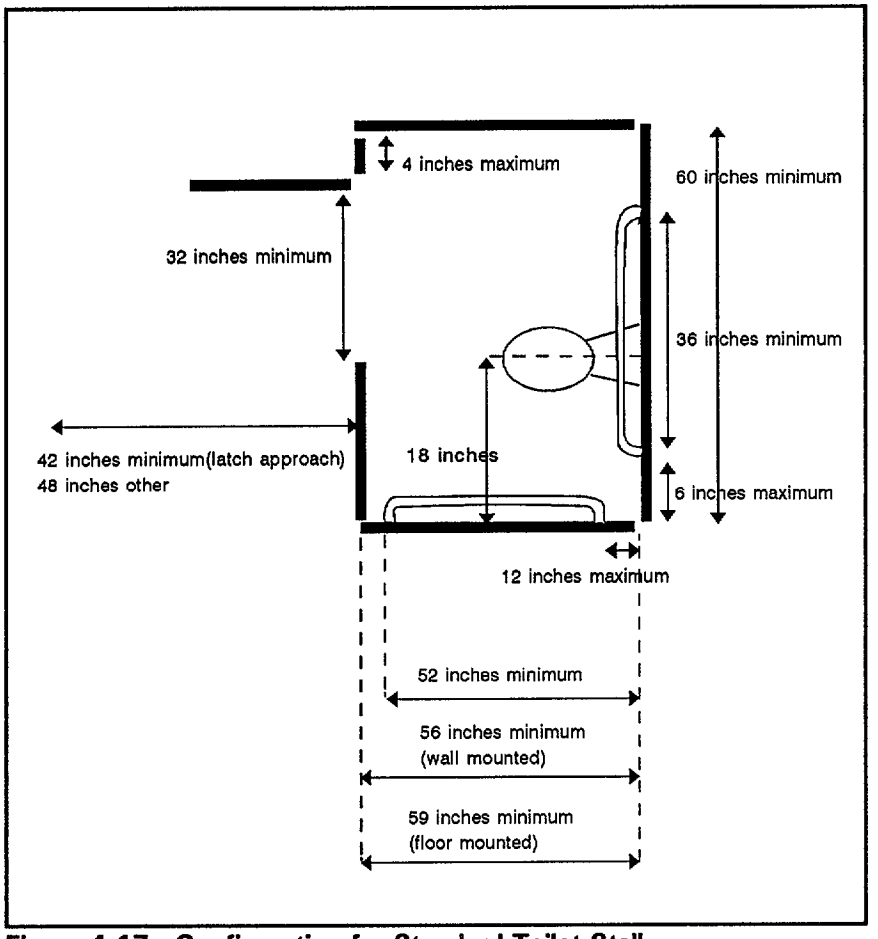


Figure 4-17. Configuration for Standard Toilet Stall

The door to the stall must be at least 32 inches wide and comply with door hardware requirements. A grab bar must be available in two places: behind the tank and to the side of the toilet. The stall must be at least 60 inches wide (*49 CFR 37: Section 4.17.3 of Appendix A*).

Where there are six or more stalls, at least one 36-inch-wide stall with an outward swinging door and parallel grab bars must also be provided (*49 CFR 37: Section 4.22.4 of Appendix A*).

It may not be technically feasible to install standard stalls during alterations. Figure 4-18 shows alternative stalls for dealing with this situation.

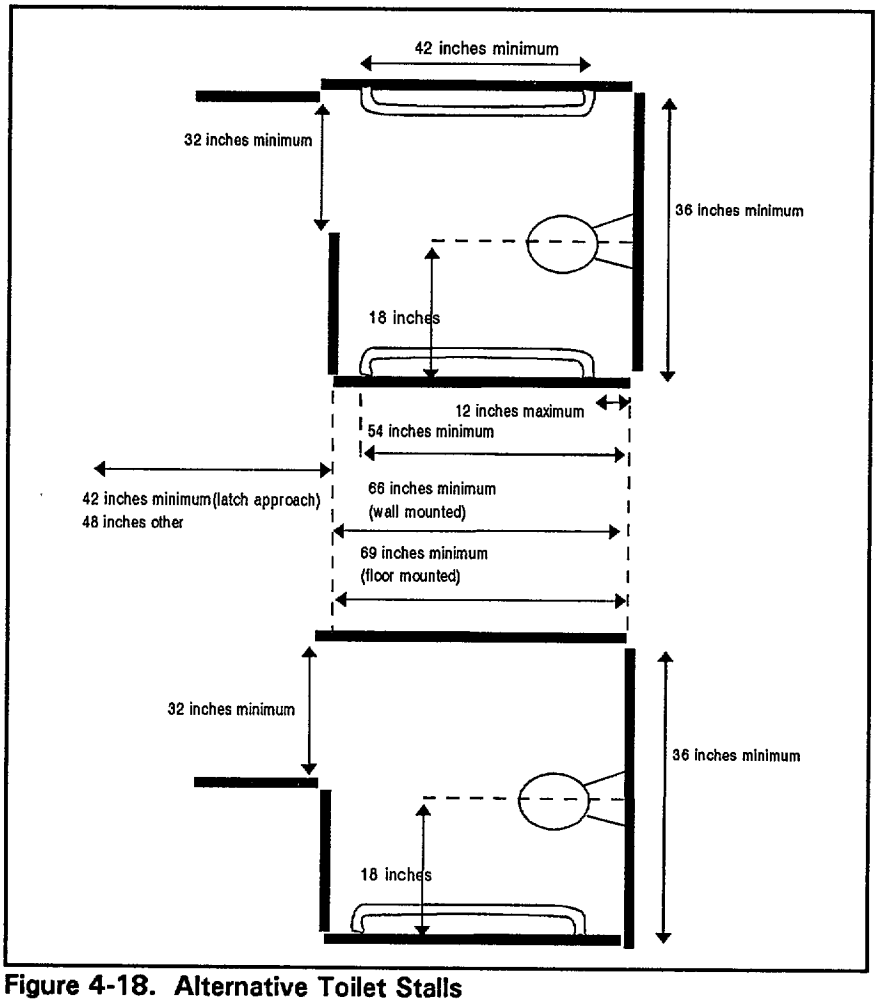


Figure 4-18. Alternative Toilet Stalls

Toe Clearances

A stall that has a depth of 60 inches or less must include at least 9 inches of toe clearance under the front partition and under one of the side partitions (*49 CFR 37: Section 4.17.4 of Appendix A*).

Doors

A restroom must have enough space for a person in a wheelchair to move to a toilet stall, open the door, and enter the stall. **Section 3.2.2, Doors,** describes the maneuvering space requirements for doors.

Grab Bars

The stall must have grab bars on the partition next to the toilet and behind it. **Section 4.3.4.1, Toilets,** and **Section 4.3.4.2, Toilet Stalls,** contain subsections that describe the requirements for grab bars.

4.3.4.3 Urinals

Urinals can be stall-type or wall-hung with an elongated rim. They can be mounted up to 17 inches from the floor ***(49 CFR 37; Section 4.18.2 of Appendix A).***

There must be a clear space of 30 x 48 inches in front of the urinal. In addition, the clear floor space must be adjacent to an accessible path ***(49 CFR 37: Section 4.18.3 of Appendix A).***

Flush controls cannot be higher than 44 inches above the floor. The flush controls must be operable with one hand only. Using the controls cannot require tight grasping, pinching, or twisting of the wrist. The force required to operate them can be no more than 5 pounds (49 ***CFR 37: Section 4.27.4 of Appendix A).***

4.3.4.4 Sinks and Mirrors

Individuals in wheelchairs must be able to use the sinks in the facility restrooms. The rim or counter surface of the sink can be no higher than 34 inches from the floor. In addition, there must be a clearance of at least 29 inches from the floor to the bottom of the apron. Another requirement is a toe clearance of at least 9 inches from the floor under the sink ***(49 CFR 37: Section 4.79.2 of Appendix A).*** Figure 4-l 9 shows the clearance dimensions for sinks.

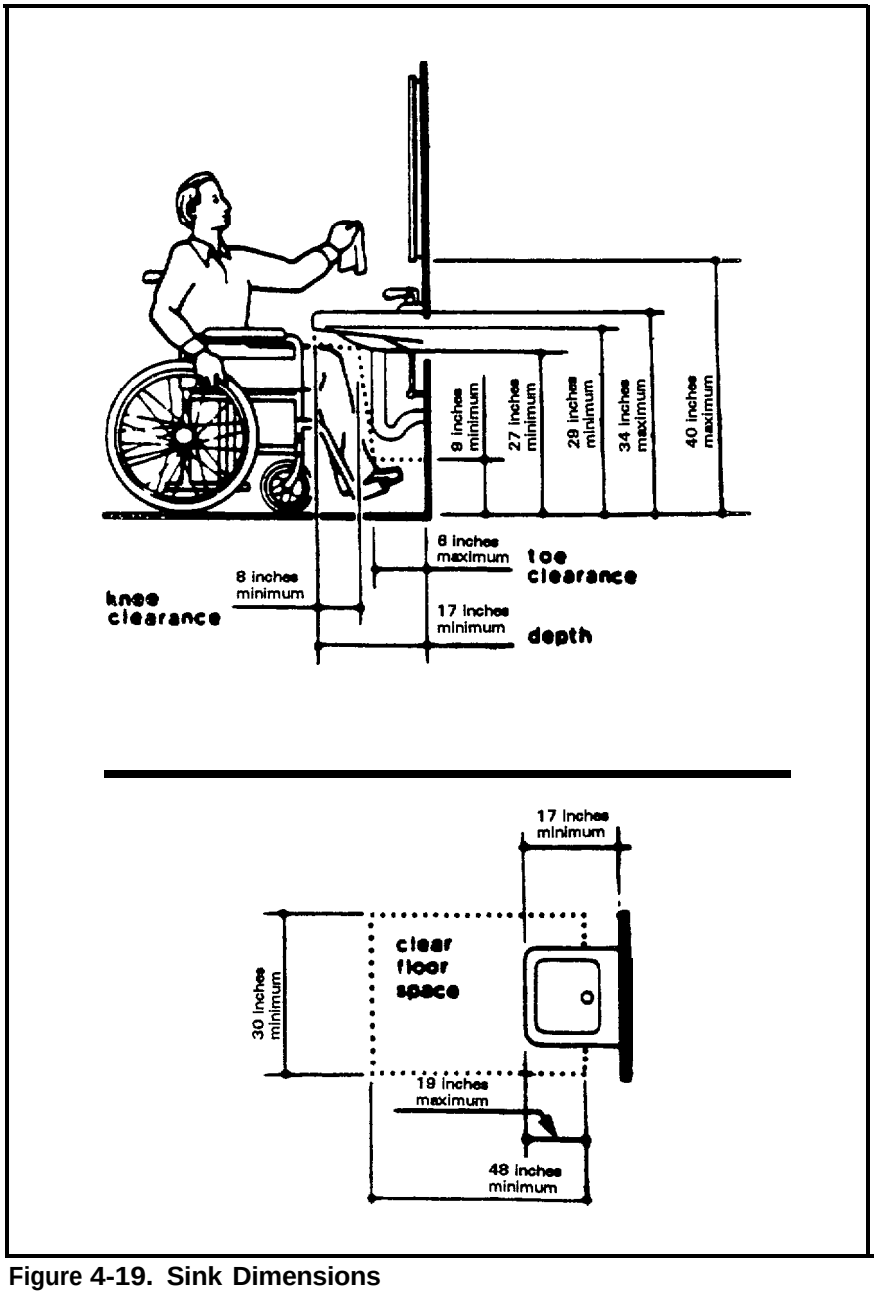


Figure 4-19. Sink Dimensions

The clear floor space in front of the lavatory must be at least 30 x 48 inches. The clear floor space may also extend a maximum of 19 inches under the sink itself (49 ***CFR 37: Section 4.79.3 of Appendix A).***

Hot water pipes cannot be installed under the sink if people can come into contact with them. In addition, the surface under the sink cannot have sharp or abrasive surfaces that a person could touch (49 ***CFR 37: Section 4.19.4 of Appendix A).***

Faucets must be operable with one hand only. The faucets cannot require tight grasping, pinching, or twisting of the wrist. The force required to operate them can be no more than 5 pounds (*49 CFR 37: Section 4.27.4 of Appendix A*). If the faucets have self-closing valves, they must be adjusted so that the minimum time they stay open is 10 seconds (*49 CFR 37: Section 4.19.5 of Appendix A*).

Mirrors in the restroom must be mounted so that people in wheelchairs can use them. The bottom edge of the reflecting surface must be no more than 40 inches above the floor (*49 CFR 37: Section 4.19.6 of Appendix A*).

In addition to a mirror mounted at the required height, another mirror mounted higher and angled toward the floor would provide a full view for a person in a wheelchair.

4.3.5 WATER FOUNTAINS

In new construction, a floor that has one drinking fountain must be accessible to both individuals in wheelchairs and individuals who have difficulty bending or stooping. Two fountains can be installed at one location, one mounted high and one mounted low. If each floor has more than one drinking fountain, at least 50% must be accessible and be on an accessible route (*49 CFR 37: Section 4.1.3 of Appendix A*).

The spout height on the water fountains can be no higher than 36 inches from the floor (*49 CFR 37: Section 4.15.2 of Appendix A*). The spout must be at the front of the drinking fountain and direct the water in a flow parallel with the front of the unit (*49 CFR 37: Section 4.15.3 of Appendix A*).

The water from the spout must rise at least 4 inches, so that a cup can be inserted under it. If the drinking fountain has a round or oval bowl, the flow of water must be within 3 inches of the front of the fountain ***(49 CFR 37: Section 4.15.3 of Appendix A).*** Figure 4-20 shows the applicable dimensions of water fountains.

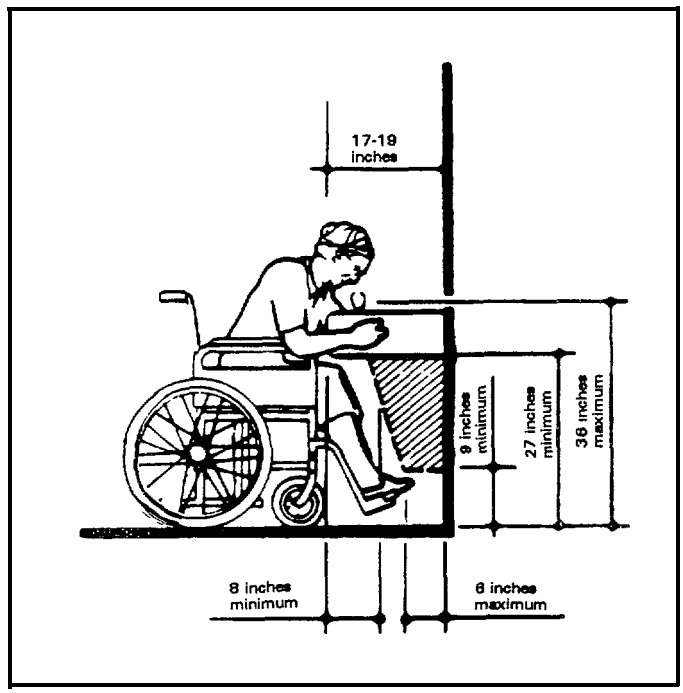


Figure 4-20. Water Fountain Dimensions

Faucets or knobs must be operable with one hand only. The controls cannot require tight grasping, pinching, or twisting of the wrist. The force required to operate them can be no more than 5 pounds (49 ***CFR 37: Section 4.27.4 of Appendix A).***

The water fountain must have enough clear space around it for a person to approach it. Wall-mounted or post-mounted fountains must have a clear space from the bottom of the apron to the floor. The clear space must be at least 27 inches high, 30 inches wide, and 17 to 19 inches deep ***(49 CFR 37: Section 4.15.5 of Appendix A).***

There must also be a clear space of at least 30 x 48 inches in front of the fountain, and it must allow a forward-facing approach (49 ***CFR 37: Section 4. 75.5 of Appendix A).***

If a drinking fountain is set into the wall or otherwise does not have a clear space under it, the clear space of at least 30 x 48 inches must allow a parallel approach to the fountain ***(49 CFR 37: Section 4.15.5 of Appendix A).***

4.3.6 RESCUE ASSISTANCE AREAS

Rescue assistance areas are spaces where, in the event of an emergency evacuation, individuals who are unable to use the stairs can wait safely for further instructions or assistance. The rescue assistance area must be located on an accessible route and must also be adjacent to an exit ***(49 CFR 37: Section 4.3.10 of Appendix A).***

The rescue assistance areas could take a number of forms (49 ***CFR 37: Section 4.2.11.1 of Appendix A):***

1. **Stairway landing.** The rescue assistance area may be a portion of a stairway landing within a smokeproof enclosure. An alternative is a portion of a stairway landing which is within an exit enclosure. The exit enclosure must be vented to the exterior and separated from the building by doors with a fire protection rating of at least one hour.

2. **Exterior exit balcony.** The rescue assistance area may be a portion of an exterior exit balcony immediately adjacent to an exit stairway. The balcony must comply with local requirements. Openings to the interior of the building located within 20 feet of the area must have fire assemblies with a fire protection rating of at least three-fourths of an hour.

3. **Fire-resistive corridor.** The rescue assistance area may be a portion of a corridor with a fire protection rating of at least one hour which is adjacent to an exit enclosure.

4. **Room approved by the local authority.** When approved by the appropriate local authority, the rescue assistance area may be a room with a fire protection rating of at least one hour. The doors of such rooms must have a fire protection rating of at least 20 minutes and must be tight-fitting and self-closing. The room must also have an exit directly to an exit enclosure.

5. **Elevator lobby.** The area of rescue assistance may be an elevator lobby, if the elevator shafts and adjacent lobbies are pressurized for smokeproofing as required by local authorities. The pressurization equipment must be activated by the smoke detectors on each floor.

4.3.6.1 Size and Number

In each area of rescue assistance there must be at least two accessible areas that are each 30 x 48 inches. There must be at least one 30 x 48 inch area on each floor of the building for every 200 persons of the calculated occupancy of the building space served by the rescue assistance area ***(49 CFR 37: Section 4.3.11.2 of Appendix A).*** The minimum is at least one rescue assistance area on each floor, each with at least two accessible 30 x 48 inch areas. **If** the calculated occupancy warrants it, additional 30 x 48 inch areas may also be required which may necessitate additional rescue assistance areas.

The 30 x 48 accessible spaces cannot reduce any of the required width of the exit ***(49 CFR 37: Section 4.3.11.2 of Appendix A).***

The one exception to this is for floors where there are less than 200 persons. In such a case the appropriate local authority may reduce the minimum number of 30 x 48 inch areas to one in each rescue assistance area ***(49 CFR 37: Section 4.3.11.2 of Appendix A).***

The stairway adjacent to a rescue assistance area must have a minimum clear width of 48 inches ***(49 CFR 37: Section 4.3.11.3).***

4.3.6.2 Two-way Communication

There must be a means of two-way communication between the rescue assistance area and the primary entry. The communication system must be capable of being used through both visual and audible means. The appropriate local authority may designate a location other than the primary entry for communication with the rescue assistance area ***(49 CFR 37: Section 4.3.11.4).***

4.3.6.3 Identification Sians

Each area of rescue assistance must display a sign including the International Symbol of Accessibility and the words, “Area of Rescue Assistance.” The signs must illuminate at all times when exit signs are illuminated.

There must also be signs at all inaccessible exits and wherever else in the building where they would help indicate the direction to the nearest rescue assistance area.

There must be clear instructions for the use of the rescue assistance area posted adjacent to the communication equipment (49 ***CFR 37: Section 4.3.11.5).***

4.3.7 EMERGENCY ALARMS

If the facility has an emergency warning system, the minimum requirement is additional visual alarm indicators in areas of common use, for example, restrooms, meeting rooms, hallways, lobbies, and waiting areas. The visual alarm system must be integrated into the facility alarm system ***(49 CFR 37: Section 4.28.2 of Appendix A).***

If audible alarms are provided, they must produce a sound that is louder than the surrounding sound level in the facility by at least 15 dbA, or a sound that exceeds any maximum sound level by 5 dbA, for a duration of 60 seconds. Whichever is chosen, the sound level cannot exceed 120 dbA ***(49 CFR 37: Section 4.28.2 of Appendix A).***

The specifications for visual alarm signals are as follows:

1. Lamp type must be xenon strobe or equivalent.
2. Light color must be clear or clear filtered white.
3. Pulse duration must be 0.2 second.
4. Intensity must be a minimum of 75 candela.
5. Flash rate must be a minimum of **1** Hz, maximum of 3 **Hz.**
6. Placement must be 80 inches above floor or 6 inches below ceiling, whichever is lower.
7. In general, no place in any room requiring a visual alarm device can be more than 50 feet horizontally from the signal. Auditoriums or other rooms over 100 feet across, without obstructions 6 feet above the floor, may have perimeter devices placed a maximum of 100 feet apart.
8. No place in corridors'or hallways can be more than 50 feet from the visual signal.

4.3.8 INFORMATION AND VENDING AREAS

Facility locations in which the public deals directly with employees must include counter space for the public; the space must be a maximum of 36 inches high. These locations include ticket counters, concession stands, information desks, and other business areas.

Providing such a counter space can take different forms. At the main counter a portion that is at least 36 inches long can be placed 36 inches high. An auxiliary counter can be located in close proximity to the main counter. Another alternative is equivalent features provided by such means as a folding shelf on a part of the counter (49 ***CFR 37:***

Section 7.2 of Appendix A). The accessible counter space must be on or adjacent to an accessible path.

4.3.9 BAGGAGE CHECK AND CLAIM AREAS

If the facility has a baggage check and claim area, it must be on an accessible path and must provide sufficient room for individuals in wheelchairs to maneuver. If a security gate is unattended, it must also be accessible ***(49 CFR 37: Section 10.3.1 of Appendix A).***

4.3.10. EMPLOYEE WORK AREAS

Work areas for employees must be designed so that individuals with disabilities can approach them and can enter and exit them. The areas should be on an accessible route and must meet the requirements for entrance widths, ramps, and other provisions that would allow approach and access. In addition, it is important to consider placing shelves, work surfaces or other accommodations at a convenient height for employees with disabilities ***(49 CFR 37: Section 4.1.1 of Appendix A).***

If there are a number of work stations of the same type, such as ticket counters or service areas, at least one or at least 5% should allow maneuvering space for individuals with disabilities. Consideration should also be given to the use of adjustable shelving and other flexible accommodations to be prepared for the needs of employees.

5. WAITING AND BOARDING

This section describes the requirements for accessibility of the areas where passengers wait for vehicles and board them. These spaces include waiting areas, platforms, bus stops and shelters, and paths to transfer to other transportation modes.

The information for waiting areas includes the requirements for:

+ the accessible route;
+ wheelchair locations; and
+ information systems.

The discussion on platforms includes requirements for:

+ platform edges;
+ platform and vehicle gap; and
+ access from the platform to the vehicle.

The discussion on bus stops and shelters includes requirements for:

+ bus stop pads;
+ bus shelters; and
+ route identification signs.

For transfers between transportation modes, the two basic requirements are:

+ accessible interior path; and
+ accessible exterior path.

5.1 WAITING AREAS

The areas where passengers wait for trains or buses must include sufficient maneuvering space to be accessible to individuals in wheelchairs, and these areas must be on an accessible path. **In** addition, devices that provide information audibly or visually must be accessible to individuals with hearing or visual disabilities.

5.1.1 ACCESSIBLE ROUTE

The waiting areas for trains or buses must be facilities located on an accessible route. An individual with a disability must be able to travel from the entrance, through the facility, and to the waiting area without encountering obstacles.

Section 3.1.1.4, Accessible Pathway, describes the requirements for an accessible route.

5.1.2 WHEELCHAIR LOCATIONS

No regulations deal specifically with the number of wheelchair locations required in transit waiting areas, but requirements do exist for accessible wheelchair locations in assembly areas with fixed seating. If fixed seating is provided in waiting areas, part of the area must be reserved for wheelchair users. Table 5-I lists the minimum requirements for wheelchair locations in waiting areas ***(49 CFR 37: Section 4.1.3 of Appendix A).***

Table 5-I. Number of Required Wheelchair Locations in Waiting Areas

Capacity of Seating in Waiting Areas	Number of Required Wheelchair Locations
4 to 25	1
26 to 50	2
51 to 300	4
301 to 500	6
Over 500	6, plus **1** additional space for each total seating capacity increase of 100

5.1.3 WHEELCHAIR SPACE

Accessible wheelchair locations must provide sufficient space for individuals in wheelchairs to move into them and remain there comfortably. The accessible path through and around the waiting **area** must provide sufficient space for individuals in wheelchairs to maneuver.

5.1.3.1 Seating Area

The accessible wheelchair spaces must provide a minimum of 33 inches in width for each wheelchair. If the space is accessible from the front or rear, the deoth of the space must be a minimum of 48 inches. If the space is accessible from the side the minimum depth is 60 inches. Figure 5-I shows these dimensions (49 ***CFR 37: Section 4.33.2 of Appendix A).***

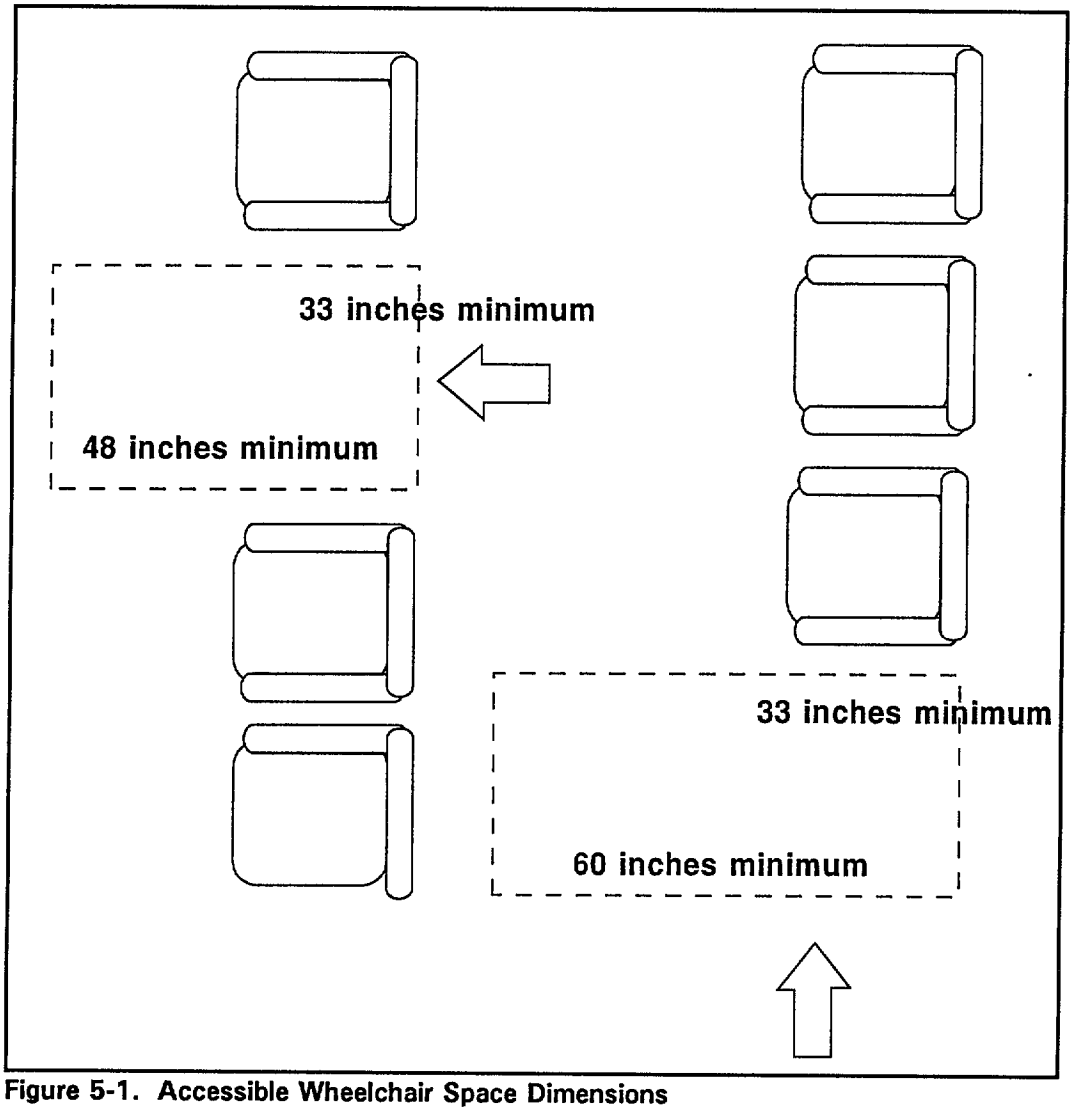


Figure 5-1. Accessible Wheelchair Space Dimensions

5.1.3.2 Accessible Path of Travel

If the path of travel for individuals in wheelchairs to move through the waiting area passes by other seats and seating areas, sufficient space must be available for the wheelchair to move through the area. If the accessible path of travel is located to the side of a seat or row of seats, the width can be 30 inches.

On the other hand, if the accessible path of travel is located in front of other seats or rows of seats, 42 inches of clear space is recommended. Figure 5-2 shows these widths (*49 CFR 37: Section 4.32 of Appendix A*).

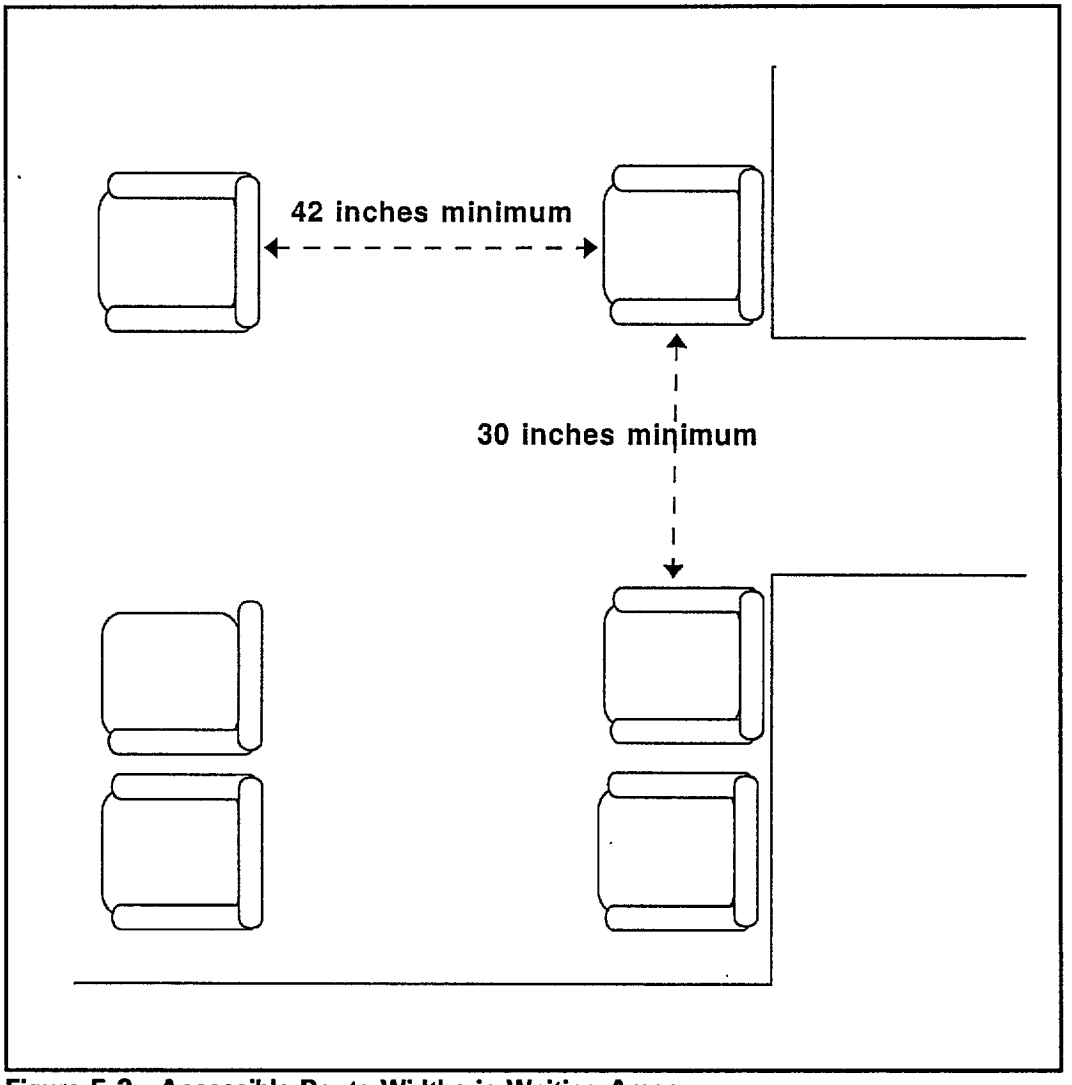


Figure 5-2. Accessible Route Widths in Waiting Areas

5.1.3.3 Floor Surface

In addition to a slip-resistant surface and ramps where surface levels change, waiting areas can have carpet. **Section 4.2.1.4, Carpet,** describes requirements for carpet in accessible areas.

5.1.4 INFORMATION SYSTEMS

Public address systems and clocks benefit everyone.

5.1.4.1 Public Address Systems

In waiting areas that provide public address systems for conveying information such as train arrivals, platform locations, and schedule information, there must be a means to convey the same information to persons with hearing impairments. Since the devices used to convey information must be visible from all locations in the waiting area, more than one device may be necessary ***(49 CFR 37: Section 10.3.1 of Appendix A).***

5.1.4.2 Clocks

If clocks are available for use by the general public, all individuals must be easily able to read the clocks. The hands, numbers, digits, or other characters must contrast with the face of the clock: either light on dark or dark on light ***(49 CFR 37: Section 10.3.1 of Appendix A).***

Clocks mounted over a circulation route must be at least 80 inches from the floor (49 ***CFR 37: Section 4.4.4 of Appendix A).*** Positioning clocks in uniform locations in the facility makes them easier to locate and read ***(49 CFR 37: Section 10.3.1 of Appendix A).***

5.2 PLATFORMS

This section covers various aspects of platforms: edges, relationship to vehicle gap, access to vehicles from platforms, lifts, ramps, and track crossings.

5.2.1 PLATFORM EDGES

When people are waiting for a train at a platform, it is very important for them to know when they are approaching the edge of the platform. Individuals with visual impairments are at most risk in this situation. If the platform edge is not marked by screens or guard rails, a detectable warning surface must be present at the platform edge. **Section 3.1.1.5, Curb Cuts,** describes detectable warnings. Detectable warnings on platform edges must be 24 inches wide running the full length of the platform.

5.2.2 PLATFORM AND VEHICLE GAP

For the safety and convenience of passengers, ideally the gap between the platform edge and the rail vehicle should be almost nonexistent. From an engineering standpoint, this minimal gap is difficult to achieve. Stations and vehicles have a wide range of dimensions. At different times and different stations, there will be new vehicles in new stations, old vehicles in new stations, and both types of vehicles in stations where it may be impossible to meet the requirements.

Where new vehicles stop at new stations, the maximum vertical gap between the vehicle and the platform surface is +/-5/8 inch under normal passenger loading conditions. The maximum allowable horizontal gap is 3 inches ***(49 CFR 37: Section 10.3.1 of Appendix A).***

The regulation provides an exception for situations in which existina vehicles stop in new stations. In these circumstances, the maximum allowable vertical gap between the vehicle and the platform surface is 1 1/2 inches.

5.2.3 ACCESS FROM PLATFORM TO VEHICLE

When it is not structurally or operationally feasible to meet the vertical and horizontal gap requirements, the following options are available if they meet the applicable requirements of 36 CFR Part 1192 or 49 CFR Part 38 ***(Section 10.3.1, Appendix A):***

- Mini-high platforms;

+ Car-borne or platform lifts;

+ Ramps; and,

+ Bridge plates or similar manually operated devices.

5.2.3.1 Mini-high Platforms

Mini-high platforms are portions of a platform that are raised or lowered to meet the vehicle height. They are useful where it is not possible for an entire platform to meet the requirements for minimum gaps between the vehicle and the platform surface (49 ***CFR 37: Section 10.3.1 of Appendix A).***

The vertical and horizontal gaps between mini-high platforms and vehicles must meet the same specifications as those of full-length platforms. **Section, 5.2.2, Platform** and **Vehicle Gap,** describes these requirements.

5.2.3.2 Car-borne or Platform Lifts

Platform lifts can be used at new stations or key stations where platforms cannot meet vertical and horizontal gap requirements. The lift must meet the requirement of 49 CFR Part 38.

A platform lift consists of a platform surface on which the wheelchair rests while a mechanism lifts or lowers the entire platform from one height to another. The lifts to move a person into and out of a vehicle may be installed at the boarding platform at each station. The lifts may also be installed on each vehicle. It is not necessary to install them on both.

Lift Dimensions

A lift for moving individuals in wheelchairs must have sufficient surface space for the wheelchair. The minimum floor space for a wheelchair is 30 x 48 inches ***(49 CFR 37: Section 4.2.4.1 of Appendix A).***

The area where the lift is deployed must adjoin or overlap an accessible route or adjoin another clear floor space that can accommodate a wheelchair ***(49 CFR 37: Section 4.3.4.2 of Appendix A).*** Figure 5-3 shows the location of the clear floor space on a wheelchair lift. The dimensions indicate a space facing the surface onto which the wheelchair will be lifted.

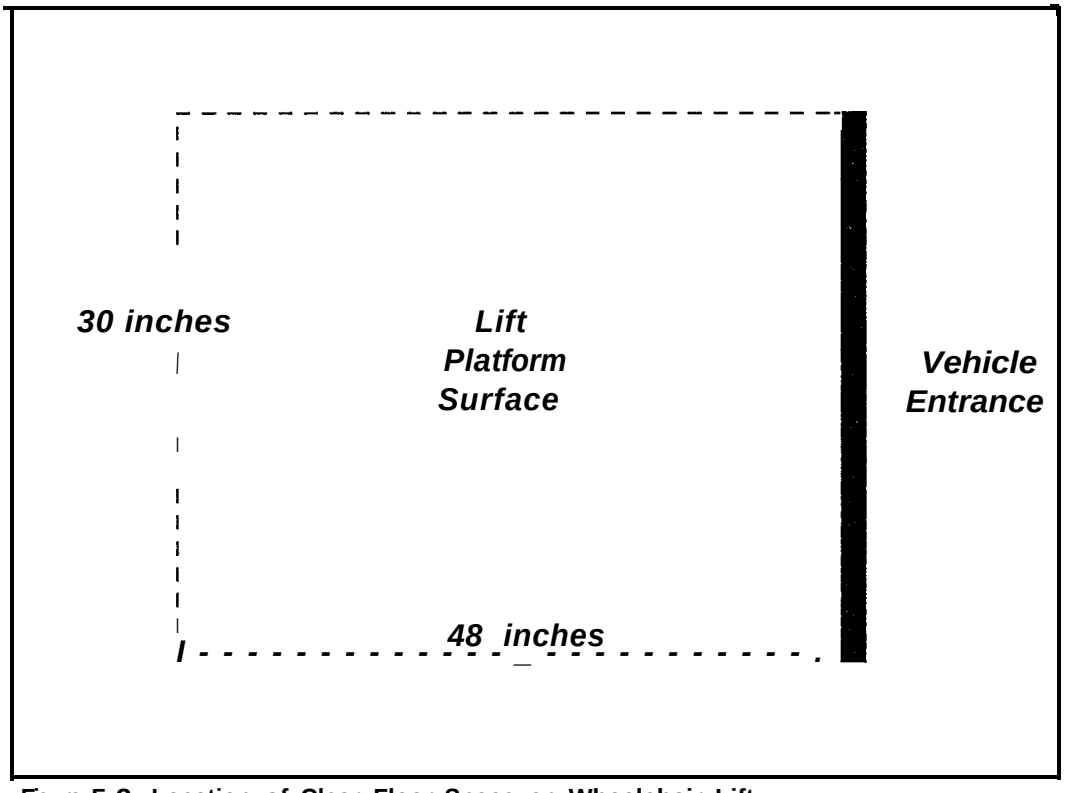


Figure 5-3. Location of Clear Floor Space on Wheelchair Lift

Lift Surface

Surfaces used for wheelchair lifts must be slip-resistant. The surfaces should remain slip-resistant in both wet and dry conditions and should not require more than normal housekeeping to retain slip-resistance.

Grates should be avoided on wheelchair lifts. Any grating or mesh should have openings no greater than 1/2 inch wide, since casters on the front of wheelchairs can easily slip into openings more than 1/2 inch wide ***(49 CFR 37: Section 4.5.4 of Appendix A).***

5.2.3.3 Ramps and Bridge Plates

Ramps and bridge plates that are connected to the station platforms can be the solution for meeting the vertical and horizontal gap requirements. If the ramp and/or bridge plates comply with 49 CFR 38.93(d) at stations or stops that require accessibility, the vehicle or car does not need to be equipped with a car-borne device.

Load Capacity

Ramps or bridge plates that are 30 inches or longer must be able to support 600 pounds distributed over an area 26 by 26 inches. The plate must also have a safety factor of 3 based on the ultimate strength of the material.

Ramps or bridge plates less than 30 inches long must be able to support 300 pounds ***(Sections 38.83, 38.95, and 38.125).***

A ramp or bridge plate surface:

1. 'Must be continuous and slip-resistant with no surface protrusions greater than 1/4 inch;
2. Must have a clear width of 30 inches; and
3. Must accommodate both four- and three-wheeled mobility aids ***(Sections 38.83, 38.95, and 38.125).***

Barriers

Each side of a ramp or bridge plate must have barriers 2 inches high to prevent the wheels of the mobility aid from slipping off the ramp or bridge plate ***(Sections 38.83, 38.95, and 38.125).***

Threshold

The vertical gap between the end of the ramp or bridge plate and the station platform can be up to 1/4 inch. Vertical differences between 1/4 and 1/2 inch require beveling to a slope of no more than 1:2 (Sections ***38.83, 38.95, and 38.125).***

Slope

Ramps or bridge plates must have the flattest slope practicable. Table 5-2 lists the acceptable slope for a ramp in terms of the vertical distance between the vehicle floor and the station platform surface ***(Sections 38.83, 38.95, and 38.125).***

Table 5-2. Maximum Slopes by Vertical Rise

Vertical Distance Under 50% Passenger Load	Maximum Steepest Slope
3 inches or less	1:4
more than 3 to 6 inches	1:6
more than 6 to 9 inches	1:8
more than 9 inches	**1:12**

For example, if the vertical distance of the ramp is 2 inches, its horizontal distance must be at least 8 inches (1:4). **If** the vertical distance of the ramp is 8 inches, its horizontal distance must be at least 64 inches (1:8).

Folding or telescoping ramps may also be installed if all of their elements meet the structural requirements.

Attachment

To prevent movement of the ramp or bridge plate during the boarding or deboarding process, either device must be attached to the station platform or vehicle. The ramp or bridge plate cannot move even when the power mobility aid moving across it is heavy.

Any gap between the ramp or bridge plate and the vehicle cannot exceed 5/8 inch (49 ***CFR 38.83).***

5.2.3.4 Track Crossings

In locations where passengers must cross tracks to reach boarding platforms, the route surface must be level and flush with the rail top at the outer edge and between the rails. The maximum allowable gap width on the inner edge of each rail is 2% inches, since that width may be necessary to allow the passage of the wheel flanges of the vehicles.

Track crossings must also be equipped with a detectable warning surface 36 inches wide. It is located where the surface of the station platform meets the track crossing (49 CFR 37: ***Section 10.3.7 of Appendix A).***

5.3 SIGNS

Permanent rooms and spaces (e.g., room numbers, "Men" "Women," exit stairs, etc.) shall be designated by signs. If no wall space is available, the signs must be mounted on the nearest adjacent wall and in a position 60 inches above the floor (49 CFR 37: ***Section 4.30.6 of Appendix A).***

5.3.1 AREA SIGNS

The signs for permanent rooms and spaces must meet the following criteria:

1. The background should contrast well with the letters and designs, either dark on light or light on dark (49 CFR 37: ***Section 4.30.5 of Appendix A).***

2. The finish should be matte or another nonglare finish (49 ***CFR 37: Section 4.30.5 of Appendix A).***

3. No obstructions should be in front of the signs so people can stand as close as 3 inches away to read them (49 ***CFR 37: Section 4.30.6 of Appendix A).***

4. Letters and numbers must be raised 1/32 inch and accompanied with Grade 2 Braille ***(49 CFR 37: Section 4.30.4 of Appendix A].***

5. Raised characters must be at least 5/8 inch high, but no more than 2 inches high ***(49 CFR 37: Section 4.30.4 of Appendix A).***

Other signs that provide directions or information-including lists of stations, routes, or destinations served by the station-should use characters and letters sized for easy reading from the distance at which they will be seen. They should have a matte, eggshell, or other nonglare surface, and the background and character colors must contrast well, either light on dark or dark on light ***(49 CFR 37: Section 4.30.5 of Appendix A).***

Overhead signs must provide at least 80 inches of clear headroom ***(49 CFR 37: Section 4.4.2 of Appendix A).*** The letters for signs mounted overhead must be at least 3 inches high ***(49 CFR 37: Section 4.30.3 of Appendix A).***

The characters on the signs must have a width-to-height ratio between 3:5 and 1:1 and a stroke-width-to-height ratio between 1:5 and **1:10** ***(49 CFR 37: Section 4.30.2 of Appendix A).*** A stroke is one line of a letter of the alphabet, as measured using the capital "X" for the particular type face.

5.3.2 STATION IDENTIFICATION SIGNS

At least one sign must identify the particular station at each platform or boarding area and entrance ***(49 CFR 37: Section 10.3.1 of Appendix A).*** This sign must meet the following specifications:

+ Letter and numbers must be raised ***1/32*** inch and accompanied with Grade 2 Braille (49 ***CFR 37: Section 4.30.4 of Appendix A).***

+ Raised characters must be at least 5/8 inch high, but not more than 2 inches high ***(49 CFR 37: Section 4.30.4 of Appendix A).***

+ No obstructions should be in front of the signs so people can stand as close as 3 inches away to read them (49 ***CFR 37: Section 4.30.6 of Appendix A).***

+ The centerline of the mounted sign must be 60 inches above the floor ***(49 CFR 37: Section 4.30.6 of Appendix A).***

Station identification signs at platforms must be placed at frequent intervals and conform to requirements for character size and contrasting colors. They must be clearly visible from inside the vehicle on both sides. If they are close to the vehicle windows, then the highest character must be below the top of the window and the lowest character above the midpoint of the window ***(49 CFR 37: Section 10.3.1 of Appendix A).***

Signs must be placed in uniform locations throughout the stations, to the maximum extent practicable to increase their effectiveness.

5.4 BUS STOPS AND SHELTERS

The location and design of new stops and shelters must provide for safely and fully deploying lifts on vehicles. Bus shelter designs must also provide for ready use by individuals in wheelchairs.

5.4.1 BUS STOP PADS

New bus stop pads at bus stops, bays, or other areas where a lift or ramp is to be deployed must have a minimum clear space for deploying the lift from the vehicle. Where feasible, the minimum clear length measured from the curb or roadway edge must be 96 inches, and the minimum clear width measured parallel to the roadway must be 60 inches. For bus stop locations where this much space is not available, the clear space should be as large as the space permits (49 ***CFR 37: Section 70.2.7 of Appendix A).***

The clear space must have a firm, stable surface. The slope of the pad, in the direction'parallel to the roadway, should be the same as the slope of the roadway itself, to the maximum extent practicable. The slope perpendicular to the roadway may be a maximum of 1:50 (2%), for the purpose of water drainage.

Selecting sites for new bus stops should include careful consideration of how lifts and ramps can be accommodated in the areas where they are to be deployed ***(49 CFR 37: Section 10.2.2 of Appendix A).*** If a bus stop is renovated or replaced, its location may need adjustment in order to deploy lifts safely.

5.4.2 BUS SHELTERS

The design of all new or replaced bus shelters must include accessibility features that allow a person in a wheelchair to enter from the public way and reach a location within the shelter. For example, the opening to the shelter cannot be so close to the curb that a person in a wheelchair would have to go onto the street in order to maneuver into the shelter. The shelter must have a minimum clear floor area of 30 x 48 inches, all of which is within the bus shelter.

Bus shelters must connect with the boarding area by an accessible route. Figure 5-4 shows one configuration for a bus stop pad and shelter; also included are the required dimensions.

5.4.3 BUS ROUTE IDENTIFICATION SIGNS

Bus route identification signs must have a background that contrasts well with the lettering, either darkon light or light on dark. The signs must also be matte, eggshell, or another nonglare finish (49 ***CFR 37: Section 4.30.5 of Appendix A).***

To the maximum extent practicable, route identification signs should comply with the specifications for character size and proportion. For signs mounted overhead, the minimum height of the sign is 80 inches from the floor. The minimum character height is 3 inches to the maximum extent permitted by sign size allowed by local codes (49 ***CFR 37: Section 4.30.3 of Appendix A).***

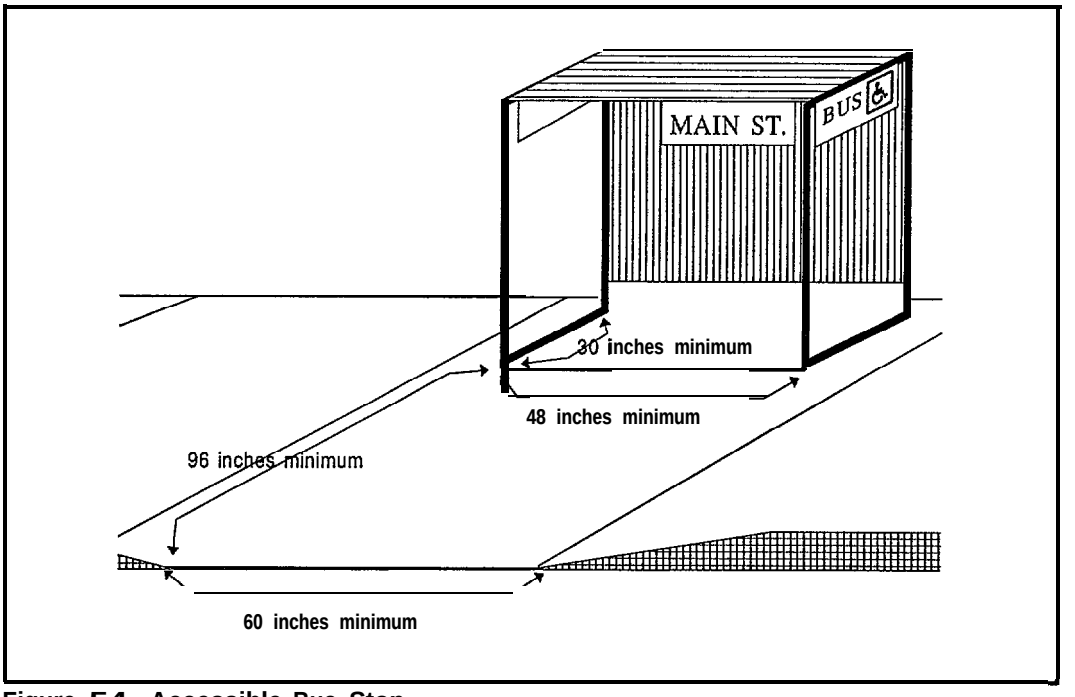


Figure 54. Accessible Bus Stop

The letters and numbers on the signs must have a width-to-height ratio between 3:5 and 1: 1. The stroke width-to-height ratio of the letters must be between 1:5 and 1:10 ***(49 CFR 37: Section 4.30.2 of Appendix A).***

All bus route identification signs that are in new locations or that replace old signs must meet these requirements.

Items such as bus schedules, timetables, or maps posted at the bus stop or bus shelter do not have to meet the requirements for letter or character sizes ***(49 CFR 37: Section 10.2.1 of Appendix A).***

5.5 TRANSFERS AND INTERMODAL CONNECTIONS

The main requirement related to transfers and intermodal connections at transit facilities is an accessible route between the boarding areas of all modes of transportation that use the facility. The

accessible route must follow the main flow of traffic in the facility as closely as possible. Carefully marking the route with direction signs helps a person move through the facility.

5.5.1 ACCESSIBLE INTERIOR PATH

The path from the accessible entrance to other accessible elements of the transit facility and between transit modes must be accessible to disabled individuals.

Section 4.2.2, Circulation Paths, describes the requirements for an accessible interior path.

5.5.1.1 Stairs

Although stairs are not part of an accessible path of travel for wheelchairs, they must be as accessible as possible to people with other impairments. **Section 4.2.3, Stairs and Ramps,** describes the requirements for stairs.

5.5.1.2 Elevators

Elevators for use by individuals in wheelchairs or others who need this assistance must be on an accessible route. **Section 4.2.4, Elevators and Escalators,** describes the requirements for elevators.

5.5.1.3 Escalators

Although escalators are not accessible to people in wheelchairs, they must be accessible to people with other impairments. **Section 4.2.4, Elevators and Escalators,** describes the requirements for escalators.

5.5.2 ACCESSIBLE EXTERIOR PATH AND ENTRANCE SIGNS

If transfer to another transit mode requires passengers to move **outside the facility, that** route must also be accessible. **Section 3.1.1.4, Accessible Pathway,** describes the requirements for an accessible exterior path.

Each accessible entrance must have a sign indicating that it is accessible. In addition, all entrances that are not accessible must have signs indicating the direction to the nearest accessible entrance. **Section 3.1 .1 .1, Signs,** and **Section 3.1 .1 .2, Placement of Signs,** describe the requirements for entrance signs.

APPENDIX:

FACILITIES ACCESSIBILITY CHECKLISTS

FACILITIES ACCESSIBILITY CHECKLISTS

YES	NO	ACCESSIBLE PATH SURFACE	REFERENCES HANDBOOK	REFERENCES REGULATIONS
☐	☐	Do all accessible paths have a stable and slip-resistant surface?	3.1.1.4	4.5.2
☐	☐	Are all changes in surface level between ¼ inch and ½ inch beveled to a slope no steeper than 1:2?	3.1.1.4	4.5.2
☐	☐	For a surface level greater than ½ inch, has a ramp been added so that the slope is no steeper than 1:12?	3.1.1.4	4.5.2
☐	☐	Are bumpy surfaces or abrupt changes in level avoided?	3.1.1.4	4.5.2
☐	☐	Are grates avoided on accessible pathways?	3.1.1.4	4.5.1
☐	☐	On unavoidable grates, are all openings more than ½ inch wide perpendicular to the direction of traffic?	3.1.1.4	4.5.4
☐	☐	Is all carpet firmly attached to the floor surface?	4.2.1.4	4.5.3
☐	☐	Does all carpet have firm padding or no padding?	4.2.1.4	4.5.3
☐	☐	Does all carpet have level loop, textured loop, level cut pile, or level cut/uncut pile texture?	4.2.1.4	4.5.3
☐	☐	Is all carpet less than ½ inch thick?	4.2.1.4	4.5.3
☐	☐	Are all carpet edges fastened securely to the floor or ground?	4.2.1.4	4.5.3
☐	☐	Is trim installed on all carpet edges and beveled to a slope no steeper than 1:2?	4.2.1.4	4.5.3

ACCESSIBLE PATH WIDTH			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Is the accessible path at least 36 inches wide?	3.1.1.4	4.3.3
☐	☐	Is the accessible path at least 32 inches wide at doors?	3.1.1.4	4.13.5
☐	☐	Does the path provide passing spaces at least 60 inches wide at least every 200 feet?	3.1.1.4	4.3.4
☐	☐	Is the path clear of obstacles that narrow it to less than 32 inches?	3.1.1.4	4.4.1
☐	☐	Do all objects wall-mounted between 27 and 80 inches from the floor protrude no more than 4 inches into the accessible path?	4.2.2.2	4.4.1
☐	☐	Are all overhead objects at least 80 inches from the floor?	4.2.2.2	4.4.2
☐	☐	When the accessible path turns around an obstacle less than 48 inches wide, is the corridor at least 42 inches wide as it approaches the obstacle?	4.2.2.1	4.3.3
☐	☐	When the accessible path turns around an obstacle 48 inches wide or more, is the corridor at least 48 inches wide as it turns around the obstacle?	4.2.2.1	4.3.3

BOARDING RAMPS AND BRIDGE PLATES			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Can boarding ramps or bridge plates that are 30 inches or longer support 600 pounds distributed over an area 26 inches x 26 inches?	5.2.3.3	38.83 38.95 38.125
☐	☐	Can boarding ramps or bridge plates that are less than 30 inches long support 300 pounds?	5.2.3.3	38.83 38.95 38.125
☐	☐	Are boarding-ramp and bridge-plate surfaces continuous and slip-resistant, with no protrusions higher than ¼ inch?	5.2.3.3	38.83 38.95 38.125
☐	☐	Do all boarding ramps or bridge plates have a clear width of at least 30 inches?	5.2.3.3	38.83 38.95 38.125
☐	☐	Do all boarding ramps or bridge plates accommodate both four- and three-wheeled mobility aids?	5.2.3.3	38.83 38.95 38.125
☐	☐	Is there no more than a ¼ inch vertical gap between the end of the boarding ramp or bridge plate and the station platform?	5.2.3.3	38.83 38.95 38.125
☐	☐	If there is a threshold between ¼ inch and ½ inch high, is it beveled with a slope no steeper than 1:2?	5.2.3.3	38.83 38.95 38.125
☐	☐	Do boarding ramps and bridge plates have the flattest slope practicable, and is the slope better than the maximum allowed based on the vehicle floor height under 50% passenger load?	5.2.3.3	38.83 38.95 38.125
☐	☐	Is the boarding ramp or bridge plate firmly attached to the platform or vehicle and stabilized even when a heavy mobility aid moves across it?	5.2.3.3	38.83 38.95 38.125
☐	☐	Is the gap between the boarding ramp or bridge plate and the vehicle no more than ⅝ inch?	5.2.3.3	38.83 38.95 38.125

BUS STOPS AND SHELTERS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Are all new bus stops and bus shelters designed to accommodate people in wheelchairs and fully deploy lifts?	5.4	10.1
☐	☐	Do accessible bus stop pads provide a minimum clear length of 96 inches, measured from the curb to the roadway edge?	5.4.1	10.2.1
☐	☐	Do accessible bus stop pads provide a minimum clear width of 60 inches, measured parallel to the roadway?	5.5.1	10.2.1
☐	☐	Do all bus stop pads have a firm, stable surface with a slope the same as the roadway itself, measured parallel to the road?	5.4.1	10.2.2
☐	☐	Do all bus stop pads have a maximum slope of 1:50, measured perpendicular to the roadway?	5.4.1	10.2.2
☐	☐	Do all accessible bus stop shelters allow individuals in wheelchairs to enter from the public way and reach a location within the shelter?	5.4.2	10.2.1
☐	☐	Do all accessible bus stop shelters provide a minimum clear floor space of 30 x 48 inches, completely included within the shelter?	5.4.2	10.2.1
☐	☐	Are all accessible bus stop shelters connected by an accessible path to the bus boarding area?	5.4.2	10.2.1

CURB CUTS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Are curb cuts installed wherever an accessible path crosses a curb?	3.1.1.5	4.7.1
☐	☐	Do all curb cuts have detectable warning surfaces?	3.1.1.5	4.7.7
☐	☐	Do all detectable warning surfaces have raised truncated domes with a diameter of 0.9 inch, a height of 0.2 inch, and center-to-center spacing of 2.35 inches?	3.1.1.5	4.29.2
☐	☐	Are all detectable warning surfaces and their surrounding surface in contrasting colors?	3.1.1.5	4.29.2
☐	☐	Do all detectable warning surfaces cover the entire width and depth of the curb ramp, excluding flared sides?	3.1.1.5	4.29.2
☐	☐	Is a detectable warning surface 36 inches wide installed wherever pedestrian traffic enters vehicle traffic and there is no curb?	3.1.1.5	4.29.5
☐	☐	Are all curb cuts entirely included in the width of the crosswalks?	3.1.1.5	4.7.9
☐	☐	Are all curb cuts without handrails or guardrails placed out of the way of regular pedestrian traffic, particularly the path that a person with vision impairment may take?	3.1.1.5	4.7.5
☐	☐	Do all curb cuts in a position where a pedestrian must cross them have flared sides instead of returned sides?	3.1.1.5	4.7.10
☐	☐	Do all curbs cuts have a minimum of 36 inches, not including the flared sides?	3.1.1.5	4.7.3
☐	☐	Do all curb cuts have a slope no steeper than 1:12?	3.1.1.5	4.7.2
☐	☐	Do all flared sides of curb cuts have a slope no steeper than 1:10 and 1:12 if the level landing at the top is less than 48 inches?	3.1.1.5	4.7.2
☐	☐	Do all diagonal curb cuts have at least 48 inches of clear space at the foot of the ramp that is in the crosswalk?	3.1.1.5	4.7.10

CURB CUTS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Are the sides of all diagonal curb cuts with returned sides parallel to the flow of traffic?	3.1.1.5	4.7.10
☐	☐	Do all diagonal curb cuts with flared sides have at least 24 inches of straight curb on either side, in the crosswalk?	3.1.1.5	4.7.10
☐	☐	Are all traffic islands that cross the accessible path cut to the road surface level or equipped with curb cuts?	3.1.1.5	4.7.11
☐	☐	Where traffic islands are equipped with curb cuts on either side, are at least 48 inches of clear space available between the ramps?	3.1.1.5	4.7.11
☐	☐	Do traffic islands have a slip-resistant and stable surface?	3.1.1.5	4.5.1

DOORS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Are all doors at least 32 inches wide, measured between all hardware with the door opened 90 degrees?	3.2.2.1	4.13.5
☐	☐	Are all doors at least 24 inches deep and at least 36 inches wide?	3.2.2.1	3.13.5
☐	☐	For doors with two leaves, does at least one leaf open at least 32 inches wide?	3.2.2.1	4.13.4
☐	☐	Does the threshold of the door rise no more than ½ inch, and are all changes in level more than ¼ inch beveled or a ramp added?	3.2.2.2	4.13.8
☐	☐	Do all doors approached from the front on the pull side have a minimum of 60 inches of depth in front and a minimum of 18 inches of width on the latch side?	3.3.1	4.13.6
☐	☐	Do all doors approached from the front on the push side have a minimum of 48 inches of depth in front and a minimum of 12 inches of width if the door closes automatically?	3.3.1	4.13.6
☐	☐	Do all doors approached from the latch side on the pull side have a minimum of 48 inches of depth in front and a minimum of 24 inches of width on the latch side?	3.3.2.1	4.13.6
☐	☐	Do all doors approached from the latch side on the push side have a minimum of 42 inches of depth in front and a minimum of 24 inches of width on the latch side?	3.3.2.1	4.13.6
☐	☐	Do all doors approached from the hinge side on the pull side have a minimum of 54 inches of clear depth in front and a minimum of 42 inches of width on the latch side?	3.3.2.2	4.13.6
☐	☐	Do all doors approached from the hinge side on the push side have a minimum of 42 inches of depth in front and a total of 54 inches of width?	3.3.2.2	4.13.6

DOORS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	If two doors are in series, is the minimum distance between the doors equal to the width of the door swinging into the vestibule plus 48 inches?	3.3.3	4.13.7
☐	☐	If two doors are in series, does only one swing into the vestibule between them?	3.3.3	4.13.7
☐	☐	Can all door hardware, such as lever-type or U-shaped handles, be used by individuals with disabilities?	3.3.4	4.13.9
☐	☐	Is all door hardware mounted no higher than 48 inches from the floor?	3.3.4	4.13.9
☐	☐	Do all doors open with a maximum force of 5 pounds?	3.3.5.1	4.13.11
☐	☐	Do all automatic doors require at least 3 seconds to reach the fully open position?	3.3.5.2	4.13.12
☐	☐	Do all automatic doors require a maximum of 15 pounds of force to stop?	3.3.5.2	4.13.12

ELEVATORS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Are all elevators, equipped with an automatic self-leveling device?	4.2.4.1	4.10.2
☐	☐	Does the automatic self-leveling device level the car to no more than a ½-inch vertical distance?	4.2.4.1	4.10.2
☐	☐	Are elevator call buttons centered at 42 inches above the floor?	4.2.4.1	4.10.3
☐	☐	Do all elevator call buttons provide a visual and audible signal that the call is registered and answered?	4.2.4.1	4.10.3
☐	☐	Are all elevator call buttons at least ¾ inch in the smaller dimension?	4.2.4.1	4.10.3
☐	☐	Is the elevator call button indicating the up direction above the button indicating the down direction?	4.2.4.1	4.10.3
☐	☐	Do objects in front of elevator call buttons protrude no more than 4 inches into the hallway?	4.2.4.1	4.10.3
☐	☐	Is an indicator light provided at each elevator entrance?	4.2.4.1	4.10.4
☐	☐	Do all indicator lights provide both a visual and an audible signal that the call is being answered?	4.2.4.1	4.10.4
☐	☐	Does the audible signal distinguish between the up and down directions?	4.2.4.1	4.10.4
☐	☐	Are all indicator light lanterns mounted so that the centerline is 72 inches from the floor?	4.2.4.1	4.10.4
☐	☐	Are all indicator light lanterns at least 2½ inches in the smaller dimension?	4.2.4.1	4.10.4
☐	☐	Can all indicator light lanterns be easily seen from the vicinity of the call buttons?	4.2.4.1	4.10.4
☐	☐	Are Braille and raised-letter floor designations provided on both jambs of all elevator doors?	4.2.4.1	4.10.5
☐	☐	Is the centerline of the floor designation on elevator door jambs 60 inches above the floor?	4.2.4.1	4.10.5
☐	☐	Are floor designation letters 2 inches high?	4.2.4.1	4.10.5
☐	☐	Are the letters raised 1/32 inch?	4.2.4.1	4.30.4

ELEVATORS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	For all elevators, is the time between notification and door closing at least 5 seconds?	4.2.4.1	4.10.7
☐	☐	For all elevators, is the time between notification and door closing at least the minimum time based on the distance between the call buttons and the elevator doors?	4.2.4.1	4.10.7
☐	☐	Are all elevator doors equipped with a device that reopens them if they are obstructed?	4.2.4.1	4.10.6
☐	☐	Does the reopening device reopen the doors without making contact with objects that are between 5 inches and 29 inches from the floor?	4.2.4.1	4.10.6
☐	☐	Do all door reopening devices keep the doors open for at least 20 seconds?	4.2.4.1	4.10.6
☐	☐	Do elevator doors open at least 36 inches wide?	4.2.4.1	4.10.9
☐	☐	Are all elevators at least 54 inches deep, measured from the door to the rear of the elevator?	4.2.4.1	4.10.9
☐	☐	Are all elevators at least 51 inches deep, measured from the front wall to the rear wall?	4.2.4.1	4.10.9
☐	☐	Are all elevators in which the door opens in the center at least 80 inches wide or can a 60-inch-diameter circle be inscribed inside?	4.2.4.1	4.10.9
☐	☐	Are all elevators in which the doors open in the corner at least 68 inches wide or can a 60-inch-diameter circle be inscribed inside?	4.2.4.1	4.10.9
☐	☐	Do all elevator floors have a slip-resistant surface?	4.2.4.1	4.5.2
☐	☐	Are all elevator floors free of sudden changes in level?	4.2.4.1	4.5.2
☐	☐	Does the carpeting in elevators meet the requirements?	4.2.4.1	4.5.3
☐	☐	Do all elevators have glazing or transparent panels?	4.2.4.1	10.3.1
☐	☐	Are car control buttons at least ¾ inch in the smaller dimension?	4.2.4.1	4.10.12

ELEVATORS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Do all car control buttons have Braille and raised-letter designations immediately to the left of the button?	4.2.4.1	4.10.12
☐	☐	Is the main floor designated by a raised star?	4.2.4.1	4.10.12
☐	☐	Are all floor buttons designed to be approached in a wheelchair from the front, and are the buttons placed no higher than 48 inches above the floor?	4.2.4.1	4.10.12
☐	☐	Are all floor buttons designed to be approached from the side in a wheelchair, and are the buttons placed no higher than 54 inches above the floor?	4.2.4.1	4.10.12
☐	☐	Are emergency controls grouped at the bottom of the control panel?	4.2.4.1	4.10.12
☐	☐	Is the centerline of the emergency buttons at least 35 inches from the floor?	4.2.4.1	4.10.12
☐	☐	Are car control panels on the front wall if elevators have center-opening doors?	4.2.4.1	4.10.12
☐	☐	In elevators with doors opening near the corner, are car control panels on the front wall or side wall next to the door?	4.2.4.1	4.10.12
☐	☐	Do all elevators include a car position indicator over the door or over the control panel?	4.2.4.1	4.10.13
☐	☐	Are all floor numbers on the car position indicator at least ½ inch high?	4.2.4.1	4.10.13
☐	☐	Do all car position indicators include either an audible signal sounding at least 20 decibels, with a frequency no higher than 1500 Hz, or an automatic verbal announcement?	4.2.4.1	4.10.13
☐	☐	If emergency communications equipment is provided in the elevator, are all operable parts less than 48 inches from the floor?	4.2.4.1	4.10.14
☐	☐	If emergency communications equipment is provided in the elevator, is it identified by raised symbols and lettering?	4.2.4.1	4.10.14

ELEVATORS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	If emergency equipment in the elevator requires a handset, is the cord at least 29 inches long?	4.2.4.1	4.10.14
☐	☐	If emergency equipment in the elevator is in a closed compartment, can the compartment be opened with one hand without tight grasping, pinching, or twisting of the wrist?	4.2.4.1	4.10.14
☐	☐	Can a person use the emergency equipment in the elevator without voice communication?	4.2.4.1	4.10.14

EMERGENCY ALARMS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Do visual alarm indicators accompany the emergency warning system in areas of common use?	4.3.6	4.28.2
☐	☐	Do audible alarms produce a sound that is louder than the surrounding sound level by at least 15 dbA, for a duration of 60 seconds?	4.3.6	4.28.2
☐	☐	Is the emergency visual alarm a xenon strobe or equivalent lamp type?	4.3.6	4.28.2
☐	☐	Is the light a clear color or clear filtered white?	4.3.6	4.28.2
☐	☐	Is the pulse duration 0.2 second?	4.3.6	4.28.2
☐	☐	Is the light intensity at least 75 candela?	4.3.6	4.28.2
☐	☐	Is the flash rate a minimum of 1 Hz and a maximum of 3 Hz?	4.3.6	4.28.2
☐	☐	Is the alarm placed 80 inches above the floor or 6 inches below the ceiling, whichever is lower?	4.3.6	4.28.2
☐	☐	Are the alarms placed so that any person is no more than 50 feet horizontally from a signal?	4.3.6	4.28.2

ESCALATORS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Are all escalators at least 32 inches wide?	4.2.4.2	10.3.1
☐	☐	Do all escalators have two continuous treads that are level before going under the comb plate?	4.2.4.2	10.3.1
☐	☐	Does each escalator tread have a strip 2 inches wide in a contrasting color that can be seen from the top and bottom of the step?	4.2.4.2	10.3.1

FARE COLLECTION			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Is at least one fare collection device located at each accessible entrance?	4.1.1	10.3.1
☐	☐	Do all fare devices provide a clear opening of at least 32 inches in width for passage of a wheelchair?	4.1.2	10.3.1
☐	☐	Do all fare collection devices provide clear space in front of at least 30 x 48 inches?	4.1.2.1	4.2.4.1
☐	☐	Does the clear floor space in front of all fare collection devices overlap or adjoin an accessible route?	4.1.2.1	4.3.4.2
☐	☐	If the clear floor space allows the wheelchair to face the fare collection device, are all controls between 15 inches and 48 inches from the floor?	4.1.2.2	4.2.5
☐	☐	If a wheelchair space faces a device that has an obstacle in front of the controls, is the obstacle no more than 25 inches deep?	4.1.2.2	4.2.5
☐	☐	If a wheelchair space faces a device that has an obstacle in front of the controls, are the controls no higher than 44 inches from the floor?	4.1.2.2	4.2.5
☐	☐	If a wheelchair space is parallel to a device that has an obstacle in front of the controls, is the obstacle no higher than 34 inches and no deeper than 24 inches?	4.1.2.2	4.2.6
☐	☐	Are all fare collection device controls operable with one hand?	4.1.2.3	4.27.4
☐	☐	Are all controls operable without small hand movements, excessive grip strength, pinching, or twisting of the wrist?	4.1.2.3	4.27.4
☐	☐	Can all controls be operated with no more than 5 pounds of force?	4.1.2.3	4.27.4

GATES AND TURNSTILES			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	On all accessible gates, is a smooth, continuous surface installed between 2 and 27 inches from the floor?	4.1.4	10.3.1
☐	☐	Do all accessible gates meet the requirements for maneuvering space in front of doors?	4.1.4	10.3.1
☐	☐	Are all accessible gates located on an accessible path?	4.1.4	10.3.1

GRADE CROSSINGS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Where a person must cross tracks, is the route surface level and flush with the top rail at the outer edge and between the rails?	5.2.3.4	10.3.1
☐	☐	If a gap occurs between the route surface and the inner edge of each rail, is it no more than 2½ inches wide?	5.2.3.4	10.3.1
☐	☐	Are all track crossings equipped with a detectable warning surface that meets requirements?	5.2.3.4	10.3.1
☐	☐	Is the detectable warning surface 36 inches wide, and is it located where the surface of the station platform meets the track crossing?	5.2.3.4	10.3.1

HANDRAILS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Are handrails provided along both sides of the ramp or stairs?	3.1.1.6	4.8.5
☐	☐	Are handrails continuous on the inside of switchback or dogleg ramps or stairs?	3.1.1.6	4.8.5
☐	☐	Where handrails are not continuous, do they extend at least 12 inches beyond the top and bottom of the ramp or stair segment?	3.1.1.6	4.8.5
☐	☐	Do all handrails have a clear space of 1½ inches between the handrail and the wall?	3.1.1.6	4.8.5
☐	☐	For handrails located in a recess, is the recess a minimum of 3 inches deep and a minimum of 18 inches above the top of the rail?	3.1.1.6	4.26.2
☐	☐	Are all handrails mounted so that the top of the gripping surface is between 34 and 38 inches from the ground or floor surface?	3.1.1.6	4.8.5
☐	☐	Do all handrails have rounded or smoothly returned ends?	3.1.1.6	4.8.5
☐	☐	Are all handrails stable in their fittings?	3.1.1.6	4.8.5
☐	☐	Does the gripping surface of all handrails have a diameter or width between 1¼ and 1½ inches?	3.1.1.6	4.26.2
☐	☐	Are all handrails and the adjacent wall free of sharp or abrasive surfaces?	3.1.1.6	4.8.5

YES	NO	LIFTS	REFERENCES HANDBOOK	REGULATIONS
☐	☐	Do all lifts have a clear surface space of 30 x 48 inches?	5.2.3.2	4.2.4.1
☐	☐	Does the area where the lift is deployed adjoin or overlap an accessible route?	5.2.3.2	4.3.4.2
☐	☐	Are lifts equipped with a slip-resistant surface?	5.2.3.2	38.83
☐	☐	Are grates with openings more than ½ inch wide avoided on lift surfaces?	5.2.3.2	4.5.4

PARKING			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Does the parking area have at least one accessible parking space, and at least the required number of accessible parking spaces based on the total number of parking spaces?	3.1.3.2	4.1.2
☐	☐	Is at least one, and at least one in 8, an accessible parking space for a van?	3.1.3.2	4.1.2
☐	☐	Are accessible parking spaces at least 96 inches wide?	3.1.3.2	4.6.3
☐	☐	Do accessible parking spaces have an access aisle at least 60 inches wide adjacent to the parking space?	3.1.3.3	4.1.2
☐	☐	Do accessible spaces for vans have an access aisle at least 96 inches wide adjacent to the parking space?	3.1.3.3	4.1.2
☐	☐	Is a vertical clearance of 98 inches provided at van accessible space and along a vehicle path to and from them?	3.1.3.3	4.6.5
☐	☐	Are all accessible parking spaces located on an accessible route to an accessible facility entrance?	3.1.3.4	4.6.3
☐	☐	Are the access aisles of accessible parking spaces part of the accessible route?	3.1.3.4	4.6.3

PASSENGER DROP-OFF AREA			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Do the passenger drop-off areas have an access aisle at least 60 inches wide and 20 feet long?	3.1.2.3	4.6.6
☐	☐	Do the passenger drop-off areas provide a minimum of 114 inches of vertical clearance?	3.1.2.3	4.6.5
☐	☐	Are all accessible passenger drop-off areas located on an accessible path?	3.1.2.1	4.6.6

YES	NO	PLATFORM EDGES	REFERENCES HANDBOOK	REGULATIONS
☐	☐	Are all platform edges equipped with a detectable warning surface if not bordered by platform screens or guard rails?	5.2.1	10.3.1
☐	☐	Does the detectable warning surface meet all requirements for texture, color, and resiliency?	5.2.1	10.3.1
☐	☐	Is the detectable warning surface 24 inches wide and does it extend the full length of the platform?	5.2.1	10.3.1

RAMPS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Is every part of the accessible path equipped with a ramp when a slope is steeper than 1:20?	3.1.1.6	4.8.1
☐	☐	Does every ramp have a slope no steeper than 1:12?	3.1.1.6	4.8.2
☐	☐	Do all ramps rise no more than 30 inches?	3.1.1.6	4.8.2
☐	☐	Do all ramps have a minimum clear width of 36 inches?	3.1.1.6	4.8.3
☐	☐	Do all ramps have landings at the top and bottom?	3.1.1.6	4.8.4
☐	☐	Do all landings have a width at least as wide as the ramp?	3.1.1.6	4.8.4
☐	☐	Do all landings have a length of at least 60 inches?	3.1.1.6	4.8.4
☐	☐	Do landings at doors meet the maneuvering space requirements for the type of door?	3.1.1.6	4.8.4
☐	☐	Are all ramps with a rise higher than 6 inches, or a horizontal run of more than 72 inches, equipped with handrails?	3.1.1.6	4.8.5
☐	☐	Do all handrails meet their requirements?	3.1.1.6	4.8.5
☐	☐	Is the cross-slope on all ramps no steeper than 1:50?	3.1.1.6	4.8.6

YES	NO	RESCUE ASSISTANCE AREAS	REFERENCES HANDBOOK	REFERENCES REGULATIONS
☐	☐	Is there at least one rescue assistance area on each floor of the building?	4.3.6.1	4.3.11.2
☐	☐	Do the enclosures of the rescue assistance areas meet the fire protection rating requirements?	4.3.6.1	4.3.11.2
☐	☐	Does each rescue assistance area have at least two 30 x 48 inch accessible areas?	4.3.6.1	4.3.11.2
☐	☐	Is there at least one 30 x 48 inch accessible area for every 200 persons of calculated occupancy?	4.3.6.1	4.3.11.2
☐	☐	Do the 30 x 48 inch areas allow the exits to be the full required width?	4.3.6.1	4.3.11.2
☐	☐	Are the stairways adjacent to rescue assistance areas at least 48 inches wide?	4.3.6.1	4.3.11.3
☐	☐	Is there a means of two-way communication between each rescue assistance area and the main entry?	4.3.6.2	4.3.11.4
☐	☐	Does the two-way communication system use both visual and audible means?	4.3.6.2	4.3.11.4
☐	☐	Are rescue assistance areas identified by illuminated signs with the International Symbol of Accessibility and the words "Area of Rescue Assistance?"	4.3.6.3	4.3.11.5
☐	☐	Are there signs at inaccessible exits and elsewhere in the building indicating the location of rescue assistance areas?	4.3.6.3	4.3.11.5
☐	☐	Are there instructions for the use of the rescue assistance areas posted adjacent to the communication equipment?	4.3.6.3	4.3.11.5

RESTROOMS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Do accessible toilets have sufficient clear floor space around them for maneuvering?	4.3.4.1	4.16.2
☐	☐	In restrooms where the toilet is approached from the front, is the clear space at least 66 inches deep and 48 inches wide?	4.3.4.1	4.16.2
☐	☐	In restrooms where the toilet is approached from the right side, is the clear floor space at least 56 inches deep and 48 inches wide?	4.3.4.1	4.16.2
☐	☐	In restrooms where the toilet is approached from the left side, is the clear floor space at least 56 inches deep and 60 inches wide?	4.3.4.1	4.16.2
☐	☐	Are all toilet seats installed so that the top of the seat is between 17 and 19 inches from the floor?	4.3.4.1	4.16.3
☐	☐	Are the grab bars mounted behind and next to all accessible toilets?	4.3.4.1	4.16.4
☐	☐	Are the grab bars mounted between 33 and 36 inches from the floor?	4.3.4.1	4.16.4
☐	☐	Is the grab bar beside the toilet 12 inches from the wall behind the tank and at least 42 inches long?	4.3.4.1	4.16.4
☐	☐	Is the grab bar behind the tank at least 12 inches from the wall on either side and at least 36 inches long?	4.3.4.1	4.16.4
☐	☐	Do all grab bars meet the requirements for handrails?	4.3.4.1	4.26
☐	☐	Are all flush controls on accessible toilets located within the reach range requirements for people in wheelchairs?	4.3.4.1	4.16.5
☐	☐	Are all toilet and urinal flush controls operable with one hand only, with no tight grasping, pinching, or twisting of the wrist?	4.3.4.1	4.27.4
☐	☐	Are all faucets operable with no more than 5 pounds of force?	4.3.4.1	4.27.4
☐	☐	Are toilet paper dispensers mounted within reach of the toilet, and is the dispenser centerline at least 19 inches from the floor?	4.3.4.1	4.16.6

YES	NO	RESTROOMS	REFERENCES HANDBOOK	REFERENCES REGULATIONS
☐	☐	Do all toilet paper dispensers allow a continuous flow of paper?	4.3.4.1	4.16.6
☐	☐	Do all toilet stalls meet their space requirements?	4.3.4.1	4.17.3
☐	☐	Is at least one stall at least 56 inches deep?	4.3.4.1	4.17.3
☐	☐	Is at least one stall at least 60 inches wide?	4.3.4.1	4.17.3
☐	☐	Where 6 or more stalls are provided, is one 36 inches wide with parallel grab bars and an outward-swinging, self-closing door?	4.3.4.1	4.22.4
☐	☐	Is a grab bar located behind the toilet and to the side of the toilet in all accessible stalls?	4.3.4.1	4.17.3
☐	☐	Do restroom doors meet all the requirements for maneuvering space around doors?	4.3.4.1	4.17.5
☐	☐	Are all urinals mounted 17 inches or less from the floor?	4.3.4.3	4.18.2
☐	☐	Do all urinals have a clear space of 30 x 48 inches in front of them?	4.3.4.3	4.18.3
☐	☐	Are all urinal flush controls no higher than 44 inches above the floor?	4.3.4.3	4.18.3
☐	☐	Are all sink counters and rims no higher than 34 inches from the floor?	4.3.4.4	4.19.2
☐	☐	Is a clear space at least 29 inches high available between the floor and the bottom of the sink apron?	4.3.4.4	4.19.2
☐	☐	Does toe clearance under the sink extend at least 9 inches from the floor?	4.3.4.4	4.19.2
☐	☐	Is a clear floor space of 30 x 48 inches available in front of the sink, and does the space extend at least 19 inches under the sink?	4.3.4.4	4.19.3
☐	☐	Are all hot water pipes and sharp abrasive surfaces under the sink protected so they cannot be touched?	4.3.4.4	4.19.4
☐	☐	Are all faucets operable with one hand only, with no tight grasping, pinching, or twisting of the wrist?	4.3.4.4	4.27.4

YES	NO	RESTROOMS	REFERENCES HANDBOOK	REFERENCES REGULATIONS
☐	☐	Are all faucets operable with no more than 5 pounds of force?	4.3.4.4	4.27.4
☐	☐	If the faucets are self-closing, do they stay open at least 10 seconds?	4.3.4.4	4.19.5
☐	☐	Is the bottom edge of all mirrors no more than 40 inches above the floor?	4.3.4.4	4.19.6

YES	NO	SIGNS	REFERENCES HANDBOOK	REFERENCES REGULATIONS
☐	☐	Are all letters on signs sized for the distance from which they will be viewed?	3.1.1.1	4.30.3
☐	☐	Do all signs have backgrounds that contrast well with letters and characters?	3.1.1.1	4.30.5
☐	☐	Do all signs have a nonglare finish?	3.1.1.1	4.30.5
☐	☐	Do all signs indicating accessibility include the International Symbol of Accessibility?	3.1.1.1	4.30.7
☐	☐	Are letters and numerals on signs at ground level raised at least 1/32 inch?	3.1	4.30.4
☐	☐	Are raised letters accompanied by Grade 2 Braille?	3.1	4.30.4
☐	☐	Are raised characters between ⅝ inch and 2 inches in height for signs at ground level?	3.1	4.30.4
☐	☐	Is the center line of signs at ground level 60 inches from the floor or ground?	3.1	4.30.6
☐	☐	Does each accessible entrance have accessibility signs?	3.1.1.1	10.3.1
☐	☐	Do accessibility signs indicate the direction of the accessible path at each place that a path becomes impassable?	3.1.1.1	10.3.1

STAIRS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Do all steps have risers of the same height and of the same width?	4.2.3.1	4.9.2
☐	☐	Do all steps have treads at least 11 inches wide?	4.2.3.1	4.9.2
☐	☐	Do step nosings project no more than 1½ inches?	4.2.3.1	4.9.3
☐	☐	Are all stairs equipped with handrails?	4.2.3.1	4.9.4
☐	☐	Do all handrails meet their requirements?	4.2.3.1	4.9.4

TELEPHONES			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	If public telephones are provided, does each floor have one accessible telephone?	4.3.3	4.1.3
☐	☐	If two or more banks of public telephones are provided, is at least one telephone in each bank accessible?	4.3.3	4.1.3
☐	☐	Does the location of the operable parts of the accessible telephone comply with the requirements for reach ranges for people in wheelchairs?	4.3.3	4.2.4.1
☐	☐	Is a clear space of 30 x 48 inches available in front of the accessible telephones?	4.3.3.1	4.2.4.1
☐	☐	Does the clear space for a person in a wheelchair in front of the accessible telephone adjoin or overlap an accessible route?	4.3.3.1	4.2.4.2
☐	☐	Is the telephone directory located within the requirements for reach ranges?	4.3.3.1	4.3.1.7
☐	☐	Are all accessible telephones and 25% of all other telephones equipped with volume controls?	4.3.3.1	4.31.5
☐	☐	Do all accessible telephones have push-button controls?	4.3.3.1	4.31.6
☐	☐	Are all accessible telephones equipped with a cord at least 29 inches long?	4.3.3.1	4.31.8
☐	☐	Is at least one telephone an accessible text telephone?	4.3.3.2	4.1.3
☐	☐	Is the text telephone permanently fixed within or adjacent to the pay telephone enclosure?	4.3.3.2	4.31.9
☐	☐	If pay telephones include portable text telephones, is a shelf with at least 6 inches vertical clearance provided?	4.3.3.2	4.31.9

WATER FOUNTAINS			REFERENCES	
YES	NO		HANDBOOK	REGULATIONS
☐	☐	Is at least one drinking fountain on each floor, or 50% of the fountains on a floor, accessible to individuals in wheelchairs and individuals who cannot bend or stoop?	4.3.5	4.1.3
☐	☐	Is the spout height on water fountains no higher than 36 inches from the floor?	4.3.5	4.15.2
☐	☐	Are all spouts at the front of the drinking fountain, and is the water flow parallel to the front of the fountain?	4.3.5	4.15.3
☐	☐	Does the trajectory of the water rise at least 4 inches?	4.3.5	4.15.3
☐	☐	Is the flow of water within 3 inches of the front of the fountain?	4.3.5	4.15.3
☐	☐	Do all faucets or knobs operate with one hand only, with no tight grasping, pinching, or twisting of the wrist?	4.3.5	4.27.4
☐	☐	Do all faucets or knobs operate with no more than 5 pounds of force?	4.3.5	4.27.4
☐	☐	Is the clear space between the floor and the bottom of the fountain apron at least 27 inches high, 30 inches wide, and 17 inches deep?	4.3.5	4.15.5
☐	☐	Is the clear space in front of the fountain 30 x 48 inches in a forward-facing position?	4.3.5	4.15.5

YES	NO	WHEELCHAIR LOCATIONS	REFERENCES HANDBOOK	REFERENCES REGULATIONS
☐	☐	In all areas with fixed seating, is at least the minimum number of wheelchair positions available based on the total number of seats?	5.1.2	4.1.3
☐	☐	Is the space provided for a wheelchair approaching from the front or rear at least 33 inches in width and 48 inches deep?	5.1.3.1	4.33.2
☐	☐	Is the space provided for a wheelchair approaching from the side at least 33 inches in width and 60 inches deep?	5.1.3.1	4.33.2
☐	☐	For an accessible path of travel around fixed seating, is at least 30 inches of clear space provided to the side of the seat or row of seats?	5.1.3.2	4.32.2
☐	☐	For an accessible path of travel around fixed seating, is at least 42 inches of clear space provided in front of the seat or row of seats?	5.1.3.2	4.32.2

GLOSSARY

GLOSSARY

Accessible. Designed for use by individuals with disabilities, including, but not limited to, blindness, deafness, loss of limbs, breathing impairments; or conditions requiring the use of a wheelchair, walker, or cane.

Accessible Entrance. An entrance leading into or out of a facility and meeting requirements of accessibility, including door width, maneuvering space, door operation, and even floor surface and threshold.

Accessible Pathway or Accessible Route or Accessible Path of Travel. On the interior or exterior of a facility, any route or path that is completely accessible from beginning to end. It incorporates features for complete accessibility, including curb cuts, ramps, and clear floor paths between elements of a facility.

ANSI A117.1. The national standards that govern accessibility for facilities that are altered or constructed without the use of federal money.

Automatic Door. Any door that opens and closes automatically when triggered. Some are triggered by a photoelectric cell mounted over the door or elsewhere to sense when someone approaches the door. Some doors are triggered by a pressure pad on the floor; the pad is equipped to sense the weight of a person approaching the door. Some are triggered by a push button mounted on one side of the door. When an individual pushes this button, the door opens automatically. Other devices are also available.

Automatic Door Closing Device. A device that automatically closes the door when it has been opened. A person may want to open the door as widely as possible to increase the available time for maneuvering through the opening.

Beveled Slope. For changes in level between 1/4 and 1/2 inch. With beveling, the slope is flatter than 1:2.

Braille. A system of writing for the blind. The characters are a pattern of raised dots in a 6-dot cell arranged in two vertical columns.

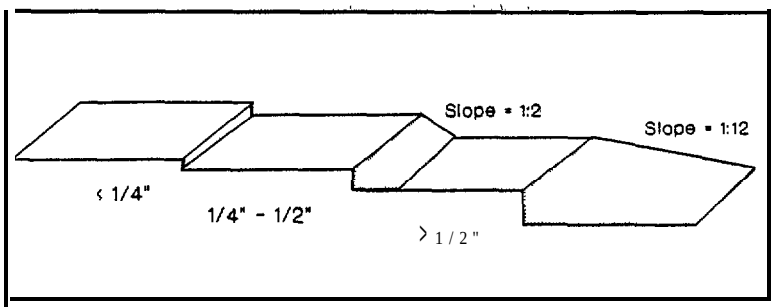
Bridge P/ate. A plate attached to either a rail vehicle or a rail platform. This plate folds into position to form a ramp over the gap between the vehicle and the platform (see Figure G-l).

Bus Stop Pad. The bus stop area at which passengers board and alight from the vehicle. This area includes the space in which the vehicle's wheelchair lift can be deployed.

Figure G-l. Bridge Plate

Changes in Floor Level. Any difference in vertical level (for 1/4 inch or more) between two adjacent portions of the floor (see Figure G-2).

Circulation Path. On the interior of a facility, the path through which individuals using the facility move from one area to another.



'igure G-2. Changes in Floor Level

Clear Headroom. Objects overhead must be located at least 80 inches from the floor, allowing sufficient room for individuals to walk underneath them without striking them.

C/ear Space or C/ear Floor Space. Space that is clear of walls, doors, or other obstructions. The space has a uniform level surface of sufficient dimension to allow a person in a wheelchair to move as needed.

Cost. See Disproportionate Cost.

Crosswalk An area at the pedestrian crossing or at an intersection. The crosswalk is marked on the street to designate where pedestrians should cross from one sidewalk to the other.

Curb Cut. Area at which the curb has been cut and sloped so that the sidewalk leads smoothly into the street and crosswalk. See also ***Diagonal Curb Cut, Flared Curb Cut,*** and ***Returned Curb Cut.***

Detectable Warning. Raised dots on a surface that contrasts with the surrounding area to alert an individual of danger ahead, for example, a transit track or street traffic. The raised dots can be detected by individuals stepping on them or moving across them in a wheelchair. The contrasting color can be readily noticed by those who can see, whereas the contrasting surface material and raised dots can be detected by those who are visually impaired and use a cane to detect obstacles.

Diagonal Curb Cut. A cut in the sidewalk at the point of the curb. This curb cut directs the user diagonally into the crosswalk (see Figure G-3). See also ***Curb Cut, Flared Curb Cut,*** and ***Returned Curb Cut.***

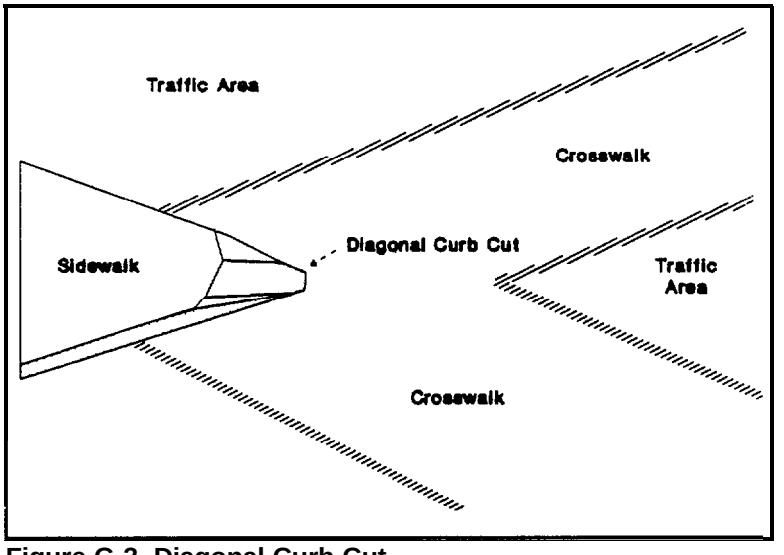


Figure G-3. Diagonal Curb Cut

Disproportionate Cost. Any amount that is more than 20% of the total cost for alterations to make a facility accessible by those with disabilities.

Dogleg Ramp or Stairs or Corridor. A ramp or staircase or hallway with a turn in it.

Door Depth. The distance from the beginning to the end of the threshold (see Figure G-4).

Door Width. The distance from one side of the door to the other, subtracting the width of the door when it is open (see Figure G-5).

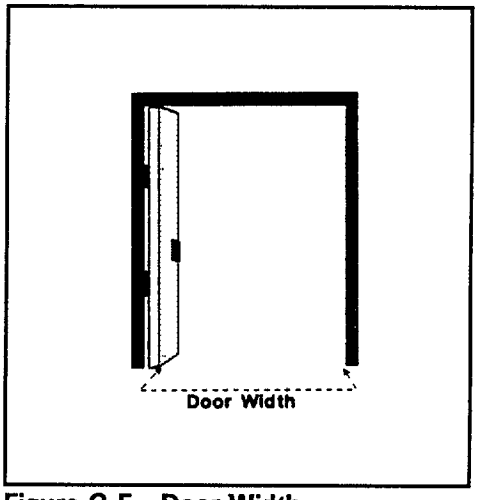


Figure G-5. Door Width

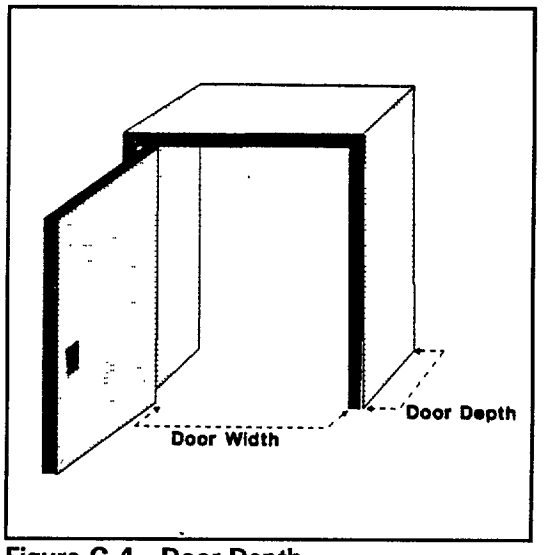


Figure G-4. Door Depth

Elevator Call Button or Hall Call Button. The hallway button that is pressed to call an elevator to the floor on which the button is located.

Elevator Indicator Lights. The lights located outside elevator doors, or in the doors themselves, to indicate that the elevator is at the floor and the direction in which the elevator is traveling.

Equivalent Facilitation. A variation in a design or performance specification that is approved because it achieves the intended standard.

Flared Curb Cut. A curb cut in which the sides of the ramp slope gently from the sidewalk to the street. ***See*** also ***Curb Cut, Diagonal Curb Cut,*** and ***Returned Curb Cut.***

Gap. See Platform Gap.

Grab Bar. A bar that is usually mounted on the wall to assist individuals with standing or sitting motions, for example, in bathrooms. Also, the portion of a handrail that is gripped by a person using it.

Grade 2 Braille. Middle grade of the three forms of Braille, which range from fully spelled to highly contracted.

Grandfathering. The allowance to comply with standards in effect when an activity took place (such as the construction of a facility) rather than with standards enacted subsequent to the activity.'

Handrail. A rail adjacent to every staircase and ramp that people use to support themselves, ensure balance, or assist movement as they go up or down the steps or ramp.

Jntercity Rail. AMTRAK, and any future rail service that primarily provides long-distance service between cities.

Intermodal Connections. At transit facilities, the connections between different modes of transportation, such as rail, bus, subway, and commuter rail.

International Symbol of Accessibility. A stylized **picture of** a person in a wheelchair. Used to designate facilities or areas that are accessible to people with disabilities (see Figure G-6).

Figure G-6. International Symbol of Accessibility

Key Station. For light rail, rapid rail, and commuter rail transit systems, a station that the system operator will make accessible because of its location within the system, its location relative to other transit modes or important activity centers, and/or its high-volume ridership. Rail system operators have to prepare a Key Station Plan for submittal to the FTA by July 26, 1992.

Leading Edge. On objects protruding from walls or otherwise being present on an accessible path, the edge that protrudes farthest into the accessible path.

Lever-type Door Handles. Door handles that unlatch the door when a person pushes down on the horizontal part of the handle (see Figure G-7).

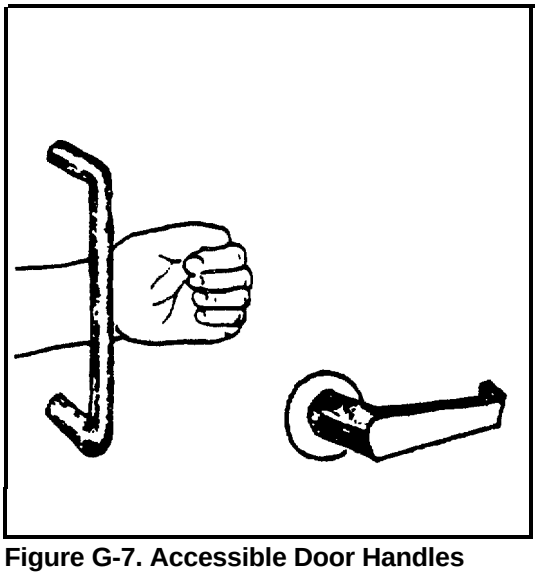


Figure G-7. Accessible Door Handles

Lift See Platform Lift.

Maneuvering Space. Space that is large enough in width and depth to allow a person in a wheelchair to complete such maneuvers as moving around a door to enter it, turning, or reversing direction.

Mobility Aid or Mobility Device. Any type of device used to increase an individual's mobility. Such an aid includes, but is not limited to, canes, walkers, wheelchairs, prostheses, three-wheeled scooters, crutches, and seeing eye dogs.

Parking Space Access Aisle. An aisle of at least 60 inches in width located adjacent to an accessible parking space. This aisle allows enough space for individuals with disabilities to safely enter and exit a vehicle.

Pedestrian. Typically refers to individuals on foot. As used here, it also includes individuals in wheelchairs traveling along pedestrian walkways.

Platform Gap. At rail platforms, the gap between the platform and the entrance to the vehicle. The gap may represent both vertical and horizontal distance.

Platform Lift. A device for moving a wheelchair from one level to another-such as up or down a small number of steps, or into or out of a vehicle. The lift consists of a platform on which the wheelchair sits and an electric, hydraulic, or electrohydraulic mechanism that moves the platform smoothly from one level to another. Wheelchair lifts also include barriers around the edges to prevent the wheelchair from rolling off the platform, controls that can be operated by the person in the wheelchair or another operator, and a means of storing the lift platform so that it does not present a hazardous obstacle when not in use.

Platform Screen. At a rail station, a screen or wall that protects the platform from the tracks. Its openings coincide with the doors of the vehicles when they enter the station.

Primary Function. As applied to transit facilities, a main activity such as ticket purchase and collection, passenger waiting, baggage checking, vehicle boarding and alighting, and information distribution.

Pull Side of a Door or Gate. The side from which the person using the door or gate would pull it to open it.

Push Side of a Door or Gate. The side from which the person using the door or gate would push it to open it.

Push-type Door Handles. Handles used to unlatch the door automatically. Pushing the mechanism (resembling a large button or pad) activates it.

Quad-cane. A cane that splits into four legs at the bottom for increased stability.

Raised Letters. Capital block letters of raised type that individuals with visual impairments can read by touch.

Ramp. A graded path with a slope of 1:20 or steeper between areas at two different heights.

Reach Range. Heights at which items can be located on a wall or device so that individuals in wheelchairs can reach them. Such items include automated teller machine controls, elevator controls, faucet handles, or other necessities.

Remanufactured. As applied to vehicles, those that have been structurally restored and have new or rebuilt major components to extend service life.

Returned Curb Cut. A curb cut in which the sides of the ramp leading from the sidewalk to the street are vertical from street level to sidewalk level. ***See*** also ***Curb Cut, Diagonal Curb Cut,*** and ***Flared Curb Cut.***

Slope. A measure of steepness expressed as a ratio between the vertical rise and the horizontal length over which the path rises. For example, if the distance between the ground and the top of the steps is 1 foot, and the ramp is 12 feet long, the slope of the ramp is 1: 12. A slope of 1: 12 is steeper than a slope of 1:20.

Stair Nosing. The part of the step that extends outward from the vertical surface (riser) at the projecting edge of each step (see Figure G-8).

Stair Riser. The vertical surface between the horizontal surface (tread) of one step and the horizontal surface of the next step (see Figure G-8).

Stair Tread. The horizontal surface of a step (see Figure G-8).

Switchback Ramp or Stairs or Corridor. A ramp, staircase, or hallway that turns back on itself (see Figure G-9).

TDD. Telephonic Device(s) for the Deaf. The device allows a person with hearing impairment to communicate over the phone by typing in messages that are received and responded to from a similar device at the other end.

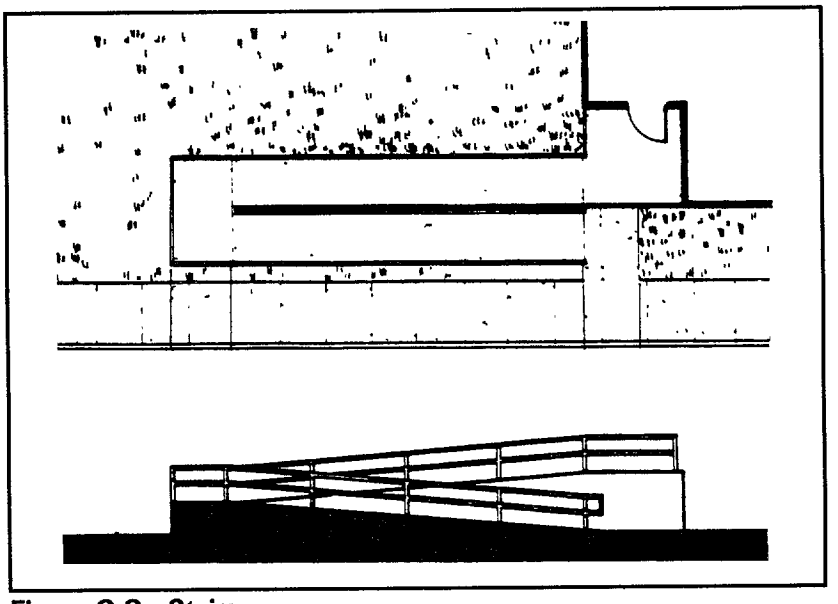


Figure G-8. Stairs

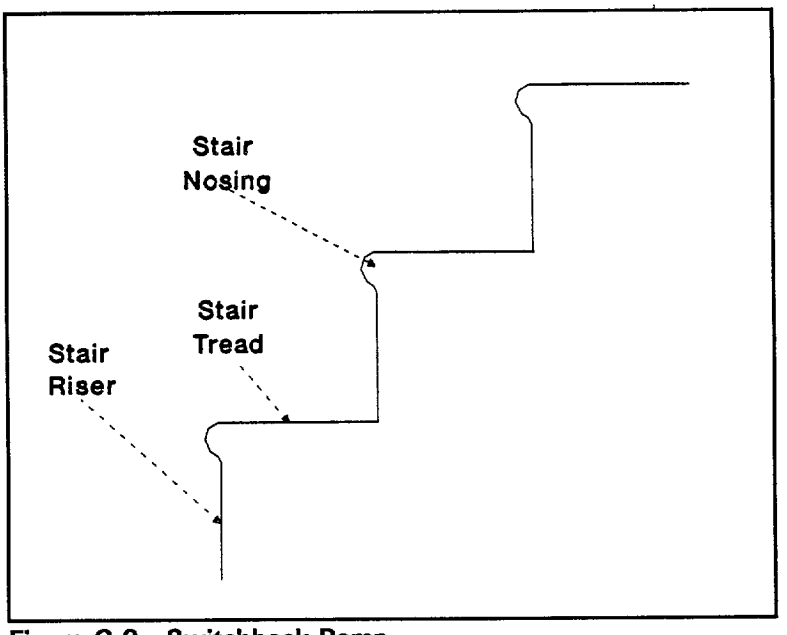


Figure G-9. Switchback Ramp

Text Telephone. See TDD.

Three-wheeled Scooter. A motorized mobility device with three wheels and a swiveling seat. The scooter is primarily used by those who can walk and stand, but not for prolonged periods of time.

Threshold Height. The change in level between the floor surface and whatever portion of the door frame rests on the floor.

Toe Clearance. Clear space of at least 9 inches required under stall walls or other partitions that do not reach the floor, and under sinks, water fountains, or other devices. The clear area increases the maneuvering space for a person in a wheelchair because the person's feet can be positioned in that space.

Uniform Federal Accessibility Standards (UFAS). The federal government standards for altering or constructing accessible facilities. The Final Rule for transportation facility accessibility uses the current version of UFAS.

U-shaped Door. Hand/es. A type of door handle that resembles a loop or squared loop. A person opens the door by putting one arm through the loop and pulling, without having to grasp the handle (see Figure G-7).

Walker. A four-legged mobility aid that the user lifts slightly and moves ahead. Then the user walks toward it while leaning on it for support (see Figure G-10).

Wheelchair Lift See Platform Lift.

Wheelchair Locations. For a fixed-seating situation, the area must be large enough to position people in wheelchairs among those in the other seats.

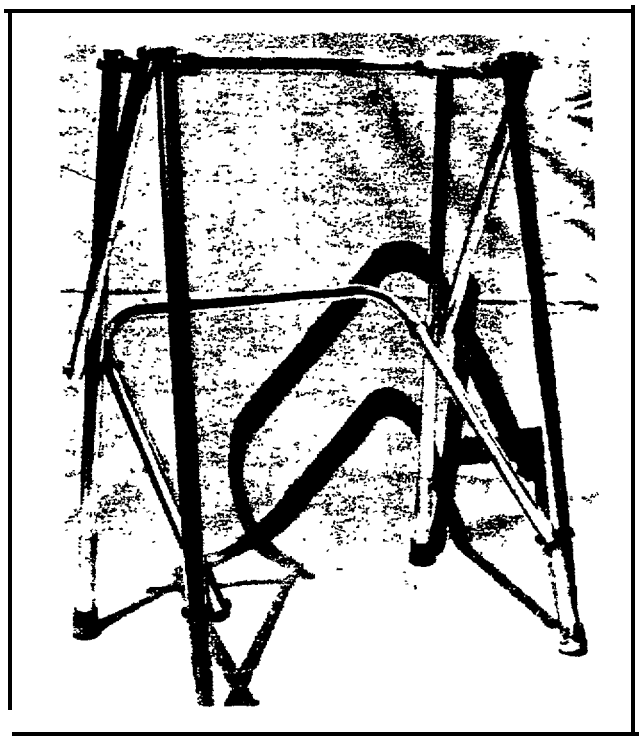


Figure G-10. Typical Walker

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