

ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD

36 CFR Part 1190

[Docket No. ATBCB 2011-04]

RIN 3014-AA26

Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way

AGENCY: Architectural and
Transportation Barriers Compliance
Board.

ACTION: Notice of Proposed Rulemaking.

SUMMARY: The Architectural and Transportation Barriers Compliance Board is proposing accessibility guidelines for the design, construction, and alteration of pedestrian facilities in the public right-of-way. The guidelines ensure that sidewalks, pedestrian street crossings, pedestrian signals, and other facilities for pedestrian circulation and use constructed or altered in the public right-of-way by state and local governments are readily accessible to and usable by pedestrians with disabilities. When the guidelines are adopted, with or without additions and modifications, as accessibility standards in regulations issued by other federal agencies implementing the Americans with Disabilities Act, Section 504 of the Rehabilitation Act, and the Architectural Barriers Act, compliance with the accessibility standards is mandatory.

DATES: Submit comments by November 23, 2011. Hearings will be held on the proposed guidelines on the following dates:

1. September 12, 2011, 9:30 to 11:30 a.m., Dallas, TX.
2. November 9, 2011, 9:30 to 11:30 a.m., Washington, DC.

ADDRESSES: Submit comments by any of the following methods:

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. Follow the instructions for submitting comments. Regulations.gov ID for this docket is ATBCB-2011-0004.

- *E-mail:* row@access-board.gov. Include docket number ATBCB 2011-04 in the subject line of the message.

- *Fax:* 202-272-0081.
- *Mail or Hand Delivery/Courier:* Office of Technical and Informational Services, Access Board, 1331 F Street, NW., Suite 1000, Washington, DC 20004-1111.

All comments will be posted without change to <http://www.regulations.gov>, including any personal information provided.

The hearing locations are:

1. Dallas: Sheraton Dallas (San Antonio A Ballroom), 400 North Olive Street, Dallas, TX 75201.

2. Washington, DC: Access Board Conference Room, 1331 F Street, NW., Suite 800, Washington, DC 20004.

FOR FURTHER INFORMATION CONTACT: Scott Windley, Office of Technical and Information Services, Architectural and Transportation Barriers Compliance Board, 1331 F Street, NW., Suite 1000, Washington, DC 20004-1111. Telephone (202) 272-0025 (voice) or (202) 272-0028 (TTY). E-mail address row@access-board.gov.

SUPPLEMENTARY INFORMATION:

Availability of Proposed Guidelines With Figures

The proposed guidelines will be codified as an appendix to 36 CFR part 1190. In the past, the Architectural and Transportation Barriers Compliance Board (Access Board) submitted "camera ready" copy (*i.e.*, images) of its guidelines to the *Federal Register* for the appendices since the guidelines included figures that illustrate the requirements in the guidelines. The appendices were not word searchable when viewed online because they are images. After discussions with the Office of the Federal Register, the Access Board has decided to submit the proposed guidelines as a Word document with only one image, the International Symbol of Accessibility (Figure R411), so the appendix will be word searchable when viewed online. A copy of the proposed guidelines with figures is available on the Access Board Web site at: <http://www.access-board.gov/prowac/nprm.htm>. Except for the International Symbol of Accessibility (Figure R411), the figures are for illustration purposes only and do not establish requirements. The copy of the proposed guidelines on the Access Board Web site also sets out advisory sections in shaded boxes, and indents subsections under the main sections.

Introduction

The Access Board is an independent federal agency established by section 502 of the Rehabilitation Act (29 U.S.C. 792).¹ The Access Board is responsible for developing accessibility guidelines for the design, construction, and

¹ The Access Board consists of 13 members appointed by the President from the public, a majority of which are individuals with disabilities, and the heads of 12 federal agencies or their designees whose positions are Executive Level IV or above. The federal agencies are: The Departments of Commerce, Defense, Education, Health and Human Services, Housing and Urban Development, Interior, Justice, Labor, Transportation, and Veterans Affairs; General Services Administration; and United States Postal Service.

alteration of facilities to ensure that they are readily accessible to and usable by individuals with disabilities. The Access Board's guidelines play an important part in the implementation of three laws that require newly constructed and altered facilities to be accessible to individuals with disabilities: the Americans with Disabilities Act, Section 504 of the Rehabilitation Act, and the Architectural Barriers Act. As further discussed under the Statutory and Regulatory Background, these laws require other federal agencies to issue regulations which include accessibility standards for the design, construction, and alteration of facilities. The regulations issued by the other federal agencies to implement these laws adopt, with or without additions and modifications, the Access Board's guidelines as accessibility standards. When the Access Board's guidelines are adopted, with or without additions and modifications, as accessibility standards in regulations issued by other federal agencies implementing these laws, compliance with the accessibility standards is mandatory.

Statutory and Regulatory Background

Americans With Disabilities Act

The Americans with Disabilities Act (42 U.S.C. 12101 *et seq.*) is a federal civil rights law that prohibits discrimination against individuals with disabilities. Title II of the Americans with Disabilities Act covers state and local governments.² The Department of Justice is responsible for issuing regulations to implement Title II of the Americans with Disabilities Act, except for the public transportation parts.³ The

² Other titles of the Americans With Disabilities Act cover employers (Title I), private entities that own, lease, or operate places of public accommodation and commercial facilities (Title III), and telecommunications (Title IV). This preamble focuses on Title II because pedestrian facilities in the public right-of-way are constructed and altered by state and local governments.

³ Title II of the Americans with Disabilities Act contains two subtitles. Subtitle A applies to all state and local government programs, services, and activities. Subtitle B contains two parts. Subtitle B, part I applies to designated public transportation provided by state and local governments by bus, rail, or other conveyance (other than aircraft or intercity or commuter rail) as a general or special service (including charter service) to the general public on a regular and continuing basis. Subpart B, part II applies to public transportation provided by the National Railroad Passenger Corporation and commuter authorities by intercity and commuter rail. The Department of Justice is responsible for issuing regulations to implement Subtitle A of Title II, except for matters within the scope of authority of the Department of Transportation under Parts I and II of Subtitle B of Title II. See 42 U.S.C. 12134. The Department of Transportation is responsible for issuing regulations to implement Parts I and II of

regulations issued by the Department of Justice include accessibility standards for the design, construction, and alteration of facilities (other than facilities used in the provision of public transportation covered by regulations issued by the Department of Transportation).⁴ The Department of Justice's accessibility standards adopt, with additions and modifications, the Access Board's current guidelines, which are discussed below under the Need for Rulemaking.⁵ See 28 CFR 35.104 and 35.151.

The Department of Transportation is responsible for issuing regulations to implement the public transportation parts of Title II of the Americans with Disabilities Act.⁶ The regulations issued by the Department of Transportation include accessibility standards for the design, construction, and alteration of facilities used in the provision of public transportation covered by the public transportation parts of Title II of the Americans with Disabilities Act. The Department of Transportation's accessibility standards adopt, with additions and modifications, the Access Board's current guidelines, which are discussed below under the Need for Rulemaking. See 49 CFR 37.9 and Appendix A to 49 CFR part 37.

Subtitle B of Title II. See 42 U.S.C. 12149 and 12164.

⁴ Subtitle A of Title II of the Americans with Disabilities Act requires that the regulations issued by the Department of Justice include accessibility standards that are "consistent with the minimum guidelines and requirements issued by the Architectural and Transportation Barriers Compliance Board." 42 U.S.C. 12134(c). The accessibility standards issued by the Department of Justice can include additional or modified requirements provided they are consistent with the Access Board's guidelines.

⁵ In September 2010, the Department of Justice issued regulations with revised accessibility standards for Titles II and III of the Americans with Disabilities Act (DOJ 2010 Standards). See 75 FR 56164 (September 15, 2010). Compliance with the DOJ 2010 Standards is required on or after March 15, 2012. State and local governments are permitted to comply with earlier standards (DOJ 1991 Standards without the elevator exception or UFAS) or the DOJ 2010 Standards between September 15, 2010 and March 14, 2012. Additional information on the applicable standards and their effective dates is available on the Department of Justice Web site at: http://www.ada.gov/revise_effective_dates-2010.htm. The DOJ 2010 Standards are available on the Department of Justice Web site at: http://www.ada.gov/2010ADASTandards_index.htm.

⁶ Parts I and II of Subtitle B of Title II of the Americans with Disabilities Act require that the regulations issued by the Department of Transportation include accessibility standards that are "consistent with the minimum guidelines and requirements issued by the Architectural and Transportation Barriers Compliance Board." 42 U.S.C. 12149(b) and 12163. The accessibility standards issued by the Department of Transportation can include additional or modified requirements provided they are consistent with the Access Board's guidelines.

The Department of Justice is responsible for overall enforcement of Title II of the Americans with Disabilities Act. The Department of Justice has designated the Department of Transportation as the federal agency responsible for investigating complaints and conducting compliance reviews "relating to programs, services, and regulatory activities relating to transportation, including highways." See 28 CFR 35.190(b)(8).

Section 504 of the Rehabilitation Act

Section 504 of the Rehabilitation Act (29 U.S.C. 794) (hereinafter referred to as "Section 504") prohibits discrimination against individuals with disabilities under any program or activity receiving federal financial assistance. The term "program or activity" includes all the operations of a state or local government entity that receives federal financial assistance directly or indirectly from the federal government. See 29 U.S.C. 794(b). Each federal agency that provides federal financial assistance is responsible for issuing regulations to implement Section 504 that are consistent with requirements established by the Department of Justice. See Executive Order 12250 in Appendix A to 28 CFR part 41. The Department of Justice requires facilities designed, constructed, or altered by recipients of federal financial assistance to be accessible to individuals with disabilities. See 28 CFR 41.58.

The Department of Transportation provides federal financial assistance to state and local governments for the development of transportation networks, including pedestrian facilities in the public right-of-way.⁷ The regulations issued by the Department of Transportation to implement Section 504 require facilities designed, constructed, or altered by recipients of federal financial assistance from the Department to comply with accessibility standards included in the Department's regulations implementing the public transportation parts of Title II of the Americans with Disabilities Act, or the Uniform Federal Accessibility Standards. See 49 CFR 27.3. As discussed above, the accessibility standards included in the Department of Transportation regulations implementing the public transportation parts of Title II of the Americans with Disabilities Act adopt, with additions and modifications, the Access Board's

⁷ See Department of Transportation "Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations" at: <http://www.dot.gov/affairs/2010/bicycle-ped.html>.

current guidelines, which are discussed below under the Need for Rulemaking. See 49 CFR 37.9 and Appendix A to 49 CFR part 37.

The Department of Transportation is responsible for investigating complaints and conducting compliance reviews under Section 504 relating to recipients of federal financial assistance from the Department. See 49 CFR 27.121 and 27.123.

Architectural Barriers Act

The Architectural Barriers Act (42 U.S.C. 4151 *et seq.*) requires certain facilities financed with federal funds to be accessible to individuals with disabilities. The Architectural Barriers Act covers facilities financed in whole or part by a federal grant or loan where the federal agency that provides the grant or loan is authorized to issue standards for the design, construction, or alteration of the facilities.⁸ See 42 U.S.C. 4151(3). The General Services Administration is required to issue accessibility standards for facilities covered by the Architectural Barriers Act.⁹ See 42 U.S.C. 4156. The accessibility standards issued by the General Services Administration adopt, without any additions or modifications, the Access Board's current guidelines, which are discussed below under the Need for Rulemaking. See 41 CFR 102-76.65.

The Access Board is responsible for enforcing the Architectural Barriers Act. See 29 U.S.C. 792(b)(1) and (e).

Need for Rulemaking

This section discusses the Congressional findings in the Americans with Disabilities Act that establish the need for accessibility guidelines, the Access Board's current accessibility guidelines, and why the Access Board is proposing to issue accessibility guidelines for pedestrian facilities in the public right-of-way.

⁸ The Architectural Barriers Act also covers facilities constructed, altered, or leased by federal agencies; and facilities constructed or altered by the Washington Metropolitan Area Transit Authority. See 42 U.S.C. 4151(1), (2), and (4).

⁹ The accessibility standards issued by the General Services Administration apply to all facilities covered by the Architectural Barriers Act, except for postal, military, and residential facilities. The United States Postal Service is responsible for issuing accessibility standards for postal facilities; the Department of Defense is responsible for issuing accessibility standards for military facilities; and the Department of Housing and Urban Development is responsible for issuing accessibility standards for residential facilities. See 42 U.S.C. 4153, 4154, and 4154a.

Congressional Findings of Discrimination

The Americans with Disabilities Act was enacted in 1990 by overwhelming bipartisan majorities in the House of Representatives (377–28) and in the Senate (91–6).¹⁰ Congress compiled an extensive record of the discrimination experienced by individuals with disabilities in critical areas such as employment, public accommodations, state and local government services, and transportation. Congress found that “despite some improvements such forms of discrimination against individuals with disabilities continue to be a serious and pervasive social problem.” 42 U.S.C. 12101(a)(2). Among the forms of discrimination that Congress found to be a continuing problem are “the discriminatory effects of architectural, transportation, and communication barriers.” 42 U.S.C. 12101(a)(5). Congress found that “the continuing existence of unfair and unnecessary discrimination and prejudice denies people with disabilities the opportunity to compete on an equal basis and to pursue those opportunities for which our free society is justifiably famous, and costs the United States billions of dollars in unnecessary expenses resulting from dependency and nonproductivity.” 42 U.S.C. 12101(a)(9). Congress declared that “the Nation’s proper goals regarding individuals with disabilities are to ensure equality of opportunity, full participation, independent living, and economic self-sufficiency for such individuals.” 42 U.S.C. 12101(a)(8).

The purpose of the Americans with Disabilities Act is “to provide a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities” and “to provide clear, strong, and consistent, enforceable standards addressing discrimination against individuals with disabilities.” 42 U.S.C. 12101(b)(1) and (2). Congress directed the Access Board to supplement the accessibility guidelines developed earlier for the Architectural Barriers Act to include “additional requirements, consistent with this Act, to ensure that buildings, facilities, rail passenger cars, and vehicles are accessible in terms of architecture and design, transportation, and communication, to individuals with disabilities.” 42 U.S.C. 12204(b).

Current Guidelines Developed Primarily for Buildings and Facilities on Sites

The Access Board’s current accessibility guidelines were issued in

¹⁰ 101 Cong. Rec. H4629 and 4630 (July 12, 1990); 101 Cong. Rec. S9695 (July 13, 1990).

2004 and are known as the Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines (hereinafter referred to as “2004 ADA and ABA Accessibility Guidelines”).¹¹ 69 FR 44083 (July 23, 2004). The 2004 ADA and ABA Accessibility Guidelines revised and updated the Americans with Disabilities Act Accessibility Guidelines, which were issued by the Access Board in 1991 (hereinafter referred to as “1991 ADAAG”). 56 FR 35408 (July 26, 1991). The requirements in the 1991 ADAAG and 2004 ADA and ABA Accessibility Guidelines were developed primarily for buildings and facilities on sites.¹² Some of the requirements can be readily applied to pedestrian facilities in the public right-of-way. However, other requirements need to be adapted for pedestrian facilities in the public right-of-way.

Proposed Guidelines Developed Specifically for Pedestrian Facilities in the Public Right-of-Way

The proposed guidelines are developed specifically for pedestrian facilities in the public right-of-way and address conditions and constraints that exist in the public right-of-way. As discussed below under the Major Issues, the requirements in the proposed guidelines make allowances for typical roadway geometry and permit flexibility

¹¹ The 2004 ADA and ABA Accessibility Guidelines are codified in 36 CFR part 1191 and consist of six appendices:

Appendix A is the Table of Contents to the guidelines;

Appendix B contains ADA Chapters 1 and 2, which include application and scoping requirements for the design, construction, and alteration of facilities covered by the Americans with Disabilities Act;

Appendix C contains ABA Chapters 1 and 2, which include application and scoping requirements for the design, construction, and alteration of facilities covered by the Architectural Barriers Act;

Appendix D contains Chapters 3 through 10, which include common technical requirements for the design, construction, and alteration of facilities covered by the Americans with Disabilities Act or the Architectural Barriers Act;

Appendix E contains the index of terms and list of figures included in the guidelines; and

Appendix F contains additions and modifications to the guidelines issued by the Department of Transportation.

The DOJ 2010 Standards and the Department of Transportation standards for transportation facilities used in the provision of transportation services covered by the transportation parts of Title II of the ADA and facilities covered by Section 504 adopt Appendices B and D, with additions and modifications. The General Services Administration standards for facilities covered by the Architectural Barriers Act adopt Appendices C and D, without additions and modifications.

¹² The term “site” is defined in the 1991 ADAAG (see 3.5) and 2004 ADA and ABA Accessibility Guidelines (see 106.5 and F106.5) as a “parcel of land bounded by a property line or a designated portion of a public right-of-way.”

in alterations to existing facilities where existing physical constraints make it impractical to fully comply with new construction requirements. The proposed guidelines also include requirements for elements and facilities that exist only in the public right-of-way such as pedestrian signals and roundabouts.

Rulemaking History

The Access Board began developing accessibility guidelines for pedestrian facilities in the public right-of-way shortly after the Americans with Disabilities Act was enacted in 1990. Proposed guidelines for state and local government facilities, including pedestrian facilities in the public right-of-way, were initially issued in 1992. 57 FR 60612 (December 21, 1992). Interim guidelines were issued in 1994. 59 FR 31676 (June 20, 1994). Final guidelines were issued in 1998, but did not include requirements for pedestrian facilities in the public right-of-way because comments submitted on the proposed and interim guidelines demonstrated a need for additional research, as well as education and outreach. 63 FR 2000 (January 13, 1998).

The Access Board subsequently sponsored research on accessible pedestrian signals and pedestrian pushbuttons, detectable warning surfaces, and pedestrian facilities at roundabouts.¹³ The Access Board also produced a series of videos, a design guide, and an accessibility checklist for pedestrian facilities in the public right-of-way, and conducted training programs around the country. The Access Board coordinated its work with organizations representing state and local government transportation officials and other transportation industry professionals, including the American Association of State Highway and Transportation Officials, Institute of Transportation Engineers, National Committee on Uniform Traffic Control Devices, and Transportation Research Board.

The Access Board established a federal advisory committee in 1999 to recommend accessibility guidelines for pedestrian facilities in the public right-of-way. The advisory committee included representatives of state and local governments, the transportation industry, disability organizations, and

¹³ The reports on the research sponsored by the Access Board and technical assistance materials on accessible design of pedestrian facilities in the public right-of-way are available on the Access Board Web site at: <http://www.access-board.gov/prowac/index.htm>.

other interested groups.¹⁴ The advisory committee provided significant sources of expertise and produced consensus recommendations for accessibility guidelines for pedestrian facilities in the public right-of-way. The advisory committee presented its recommendations, "Building a True Community: Final Report of the Public Rights-of-Way Access Advisory Committee", to the Access Board in 2001.¹⁵

The Access Board developed draft accessibility guidelines for pedestrian facilities in the public right-of-way based on the advisory committee's recommendations, and made the draft guidelines available for public review and comment in 2002.¹⁶ 67 FR 41206 (June 17, 2002). The Access Board revised the draft guidelines in 2005 and made the revised draft guidelines available for public review to facilitate the gathering of data for a regulatory assessment of the potential costs and benefits of the guidelines. 70 FR 70734 (November 23, 2005). The Access Board entered into an interagency agreement with the Volpe National Transportation Systems Center (Volpe Center) to gather data and prepare cost estimates for the regulatory assessment.¹⁷

¹⁴ The following organizations were members of the advisory committee: AARP, America Walks, American Association of State Highway and Transportation Officials, American Council of the Blind, American Institute of Architects, American Public Transit Association, American Public Works Association, Association for Education and Rehabilitation of the Blind and Visually Impaired, Bicycle Federation of America, Californians for Disability Rights, Canadian Standards Association (Technical Committee on Barrier-Free Design), City of Birmingham (Department of Planning, Engineering and Permits), Council of Citizens with Low Vision International, Disability and Business Technical Assistance Centers, Disability Rights Education and Defense Fund, Federal Highway Administration, Hawaii Commission on Persons with Disabilities, Hawaii Department of Transportation, Institute of Traffic Engineers, Los Angeles Department of Public Works (Bureau of Street Services), Massachusetts Architectural Access Board, Municipality of Anchorage, National Center for Bicycling and Walking, National Council on Independent Living, National Federation of the Blind, New York State Department of Transportation, Paralyzed Veterans of America, Portland Office of Transportation, San Francisco Mayor's Office on Disability, State of Alaska, TASH, Texas Department of Transportation, and The Seeing Eye.

¹⁵ The advisory committee report is available on the Access Board Web site at: <http://www.access-board.gov/prowac/commrept/index.htm>.

¹⁶ The 2002 and 2005 draft guidelines and comments submitted on the 2002 draft guidelines are available on the Access Board Web site at: <http://www.access-board.gov/prowac/index.htm>.

¹⁷ Volpe Center, "Cost Analysis of Public Rights-of-Way Accessibility Guidelines" (November 29, 2010). The document is available in the rulemaking docket (ATBCB-2011-0004) at: <http://www.regulations.gov>.

Major Issues

Transportation officials who commented on the 2002 draft guidelines raised some major issues that are addressed below.

Alterations to Existing Facilities

The draft guidelines required alterations to existing facilities to comply with the requirements for new construction to the maximum extent feasible. Most of the improvements in the public right-of-way involve alterations to existing facilities. Transportation officials noted that the meaning of the term "to the maximum extent feasible" was not clear and wanted additional guidance on how to apply the guidelines when existing facilities are altered.

The proposed guidelines clarify that where elements, spaces, or facilities are altered, each altered element, space, or facility within the scope of the project must comply with the applicable requirements for new construction (see R202.3). The phrase "within the scope of the project" is intended to focus on whether the alteration project presents an opportunity to design the altered element, space, or facility in an accessible manner. It is not intended for additional work to be done outside the scope of the project. For example, if an alteration project involves only installing pedestrian signals at existing intersections and there are no detectable warning surfaces on the curb ramps at the intersections, the proposed guidelines would require accessible pedestrian signals and pedestrian pushbuttons to be provided at the intersections because they are within the scope of the project, but would not require detectable warning surfaces to be provided on the curb ramps because they are not within the scope of the project. The proposed guidelines also clarify that where elements are altered or added to existing facilities but the pedestrian circulation path to the altered or added elements is not altered, the pedestrian circulation path is not required to comply with the proposed requirements for pedestrian access routes (see R202.1). For example, if a new bench is installed on a sidewalk that has a cross slope exceeding 2 percent, the sidewalk is not required to be altered to reduce the cross slope because the bench is installed on the sidewalk.

In addition, the proposed guidelines recognize that it is not always possible for altered elements, spaces, or facilities to fully comply with new construction requirements because of existing physical constraints. Where existing

physical constraints make it impracticable for altered elements, spaces, or facilities to fully comply with the requirements for new construction, compliance is required to the extent practicable within the scope of the project (see R202.3.1). Existing physical constraints include, but are not limited to, underlying terrain, right-of-way availability, underground structures, adjacent developed facilities, drainage, or the presence of a notable natural or historic feature. The proposed guidelines permit flexibility in alterations to existing facilities where needed.

Existing Facilities That Are Not Altered

Transportation officials expressed concern about application of the draft guidelines to existing facilities that are not altered. The proposed guidelines clarify that the guidelines do not address existing facilities unless they are included within the scope of an alteration undertaken at the discretion of a covered entity (see R101.2).

The Department of Justice regulations implementing Title II of the Americans with Disabilities Act contain requirements for state and local governments regarding program accessibility and existing facilities. See 28 CFR 35.150. The Department of Transportation regulations implementing Section 504 also contain requirements for recipients of federal financial assistance from the Department regarding compliance planning. See 49 CFR 27.11(c). The Access Board acknowledges that transportation officials are concerned about their obligations under the Title II of the Americans with Disabilities Act and Section 504 for existing facilities that are not altered, but the Access Board does not have the authority to address the application of the proposed guidelines to existing facilities that are not altered. When the Department of Justice and Department of Transportation conduct rulemaking to include accessibility standards for pedestrian facilities in the public right-of-way in regulations implementing Title II of the Americans with Disabilities Act and Section 504, they will address the application of the accessibility standards to existing facilities that are not altered. Comments concerning existing facilities that are not altered should be directed to the Department of Justice and Department of Transportation when they conduct rulemaking to include accessibility standards for pedestrian facilities in the public right-of-way in regulations implementing Title II of the Americans with Disabilities Act and Section 504.

Allowances for Typical Roadway Geometry

The 1991 ADAAG and 2004 ADA and ABA Accessibility Guidelines specify a maximum running slope of 5 percent and maximum cross slope of 2 percent for walking surfaces on accessible routes. The draft guidelines adapted these requirements for pedestrian access routes in the public right-of-way and made an allowance for typical roadway geometry by permitting the grade of pedestrian access routes within sidewalks to equal the general grade established for the adjacent street or highway. The draft guidelines also permitted the cross slope of pedestrian access routes within midblock pedestrian street crossings and of curb ramps at midblock pedestrian street crossings to equal the street or highway grade.

Transportation officials recommended that additional allowances be made for typical roadway geometry. The proposed guidelines include the following allowances for typical roadway geometry:

- The grade of pedestrian access routes within sidewalks is permitted to equal the general grade established for the adjacent street or highway (see R302.5).
- A maximum cross slope of 5 percent is permitted for pedestrian access routes within pedestrian street crossings without yield or stop control where vehicles can proceed through the intersection without slowing or stopping (see R302.6.1).
- The cross slope of pedestrian access routes within midblock pedestrian street crossings is permitted to equal the street or highway grade (see R302.6.2).
- The cross slope of curb ramps, blended transitions, and turning spaces at pedestrian street crossings without yield or stop control where vehicles can proceed through the intersection without slowing or stopping, and at midblock pedestrian street crossings are permitted to equal the street or highway grade (see R304.5.3).
- Clear spaces required at accessible pedestrian signals and pedestrian pushbuttons and at other accessible elements are permitted to have a running slope consistent with the grade of the adjacent pedestrian access route (see R404.2).

A maximum grade of 5 percent and maximum cross slope of 2 percent are required otherwise for pedestrian access routes within sidewalks and pedestrian street crossings (see R302.5 and R302.6).

Overview of Proposed Guidelines

The proposed guidelines apply to pedestrian facilities in the public right-

of-way. The proposed guidelines define the public right-of-way to mean “public land or property, usually in interconnected corridors, that is acquired for or dedicated to transportation purposes” (see R105.5). The proposed guidelines ensure that the following facilities for pedestrian circulation and use located in the public right-of-way are readily accessible to and usable by pedestrians with disabilities:

- Sidewalks, pedestrian overpasses and underpasses, and other pedestrian circulation paths, including requirements for pedestrian access routes, alternate pedestrian access routes when pedestrian circulation paths are temporarily closed, and protruding objects along or overhanging pedestrian circulation paths;
- Pedestrian street crossings, medians, and pedestrian refuge islands, including requirements for curb ramps or blended transitions, and detectable warning surfaces;
- Pedestrian street crossings at roundabouts, including requirements for detectable edge treatments where pedestrian crossing is not intended, and pedestrian activated signals at multi-lane pedestrian street crossings;
- Pedestrian street crossings at multi-lane channelized turn lanes at roundabouts and at other signalized intersections, including requirements for pedestrian activated signals;
- Pedestrian signals, including requirements for accessible pedestrian signals and pedestrian pushbuttons;
- Transit stops and transit shelters for buses and light rail vehicles, including requirements for boarding and alighting areas at sidewalk or street level, boarding platforms, and route signs;
- Pedestrian at-grade rail crossings, including requirements for flangeway gaps;
- On-street parking that is marked or metered, and passenger loading zones;
- Pedestrian signs, including requirements for visible characters on signs and alternative requirements for audible sign systems and other technologies;
- Street furniture for pedestrian use, including drinking fountains, public toilet facilities, tables, counters, and benches; and
- Ramps, stairways, escalators, handrails, doors, doorways, and gates.

Use of Mandatory Language in Proposed Guidelines

The proposed guidelines use the mandatory language “shall” and “requirement” because the guidelines are intended to be adopted, with or without additions and modifications, as

accessibility standards in regulations issued by other federal agencies implementing Title II of the Americans with Disabilities Act, Section 504, and the Architectural Barriers Act. In this regard, the proposed guidelines are analogous to model codes. Model codes use mandatory language but compliance with model codes is not mandatory until they are adopted by a state or local government. When the Access Board’s guidelines are adopted, with or without additions and modifications, as accessibility standards in regulations issued by other federal agencies implementing Title II of the Americans with Disabilities Act, Section 504, and the Architectural Barriers Act, compliance with the accessibility standards is mandatory. The other federal agencies will conduct separate rulemakings to include accessibility standards for pedestrian facilities in the public right-of-way in regulations implementing Title II of the Americans with Disabilities Act, Section 504, and the Architectural Barriers Act. The other federal agencies will establish the effective dates for compliance with the accessibility standards when they complete their rulemakings. The other federal agencies may permit use of the proposed guidelines as best practices pending the completion of their rulemakings. However, the proposed guidelines are not legally enforceable until adopted, with or without additions and modifications, as accessibility standards by other federal agencies in regulations implementing Title II of the Americans with Disabilities Act, Section 504, and the Architectural Barriers Act.

Impacts on State and Local Governments

When the proposed guidelines are adopted, with or without additions and modifications, as accessibility standards by other federal agencies in the regulations implementing Title II of the Americans with Disabilities Act, Section 504, and the Architectural Barriers Act, the accessibility standards will apply to units of state and local government that construct streets and highways.¹⁸ For ease of reference, these state and local governmental units are referred to as

¹⁸ Private entities that design, construct, or alter places of public accommodation or commercial facilities on sites are required to comply with accessibility standards included in regulations issued by the Department of Justice to implement Title III of the Americans with Disabilities Act. See 28 CFR 36.401 through 36.406. State or local laws may require sites with frontage on the public right-of-way or frontage that will revert to the public right-of-way to make frontage improvements in accordance with state or local standards which contain accessibility requirements that are similar to the proposed guidelines.

“state and local transportation departments” in this preamble but may go by different names (e.g., public works departments, or highway or streets departments) in their respective jurisdictions. State and local transportation departments may be required to comply with three accessibility standards. For example, a state or local transportation department that finances the design, construction, or alteration of a pedestrian facility in the public right-of-way with a federal grant or loan from the Department of Transportation would be required to comply with the accessibility standards issued by the Department of Justice in regulations implementing Title II of the Americans with Disabilities Act, the accessibility standards issued by the Department of Transportation in regulations implementing Section 504, and the accessibility standards issued by the General Services Administration in regulations implementing the Architectural Barriers Act. All three accessibility standards would be basically uniform because they adopt the proposed guidelines, but may vary to the extent that Department of Justice, Department of Transportation, and General Services Administration include additions or modifications to the proposed guidelines in their accessibility standards.

The Access Board prepared a regulatory assessment of the potential costs and benefits of the proposed guidelines. The regulatory assessment is available in the regulatory docket at <http://www.regulations.gov> and on the Access Board Web site at: <http://www.access-board.gov/prowac/index.htm>. The proposed guidelines are compared to a baseline to assess their potential costs and benefits. The baseline is how state and local transportation departments would design and construct pedestrian facilities in the public right-of-way in the absence of the proposed guidelines. All state transportation departments maintain design manuals and standard drawings for improvements in the public right-of-way.¹⁹ Most local transportation department also maintain design manuals and standard drawings for improvements in the public right-of-way that are consistent with the design manuals and standard drawings maintained by their state transportation departments. State and local

¹⁹ Links to the design manuals and standard drawings maintained by state transportation departments are available on the Federal Highway Administration Web site at: <http://www.fhwa.dot.gov/programadmin/statematerials.cfm> and <http://www.fhwa.dot.gov/programadmin/statestandards.cfm>.

transportation departments use publications issued by the American Association of State and Highway Transportation Officials (AASHTO) in their design manuals and standard drawings, including the “Policy on Geometric Design of Highways and Streets” (2004) (commonly referred to as the “AASHTO Green Book”) and the “Guide for the Planning, Design, and Operation of Pedestrian Facilities” (2004) which incorporate accessibility in the design of sidewalks and other pedestrian facilities.²⁰ The Federal Highway Administration as part of its stewardship and oversight responsibilities has also worked with state transportation departments to incorporate accessibility in their design manuals and standards drawings. The Federal Highway Administration has issued guidance that the accessibility standards in the Department of Justice regulations implementing Title II of the Americans with Disabilities Act and the Department of Transportation regulations implementing Section 504 “are to be used to the extent feasible” for the design of pedestrian facilities in the public right-of-way until new accessibility standards are adopted for these facilities.²¹ The Federal Highway Administration has also issued guidance that the 2005 draft of the proposed guidelines for pedestrian facilities in the public right-of-way “are the currently recommended best practices, and can be considered the state of the practice that could be followed for areas not fully addressed” in the existing accessibility standards.²²

In the absence of the proposed guidelines, the regulatory assessment assumes that state and local transportation departments will use the revised accessibility standards in the Department of Justice regulations

²⁰ The AASHTO “Policy on Geometric Design of Highways and Streets” and “Guide for the Planning, Design, and Operation of Pedestrian Facilities” incorporate accessibility in the design of sidewalks, including minimum clear width, passing spaces, grade, cross slope, protruding objects, and surface treatments; curb ramps, including detectable warning surfaces; pedestrian overpasses and underpasses; and transit stops and transit shelters.

²¹ See Federal Highway Administration, Office of Program Administration, “Pedestrians and Accessible Design” at: <http://www.fhwa.dot.gov/programadmin/pedestrians.cfm>. When the guidance was issued, the applicable accessibility standards in the Department of Justice regulations implementing Title II of the Americans with Disabilities Act and the Department of Transportation regulations implementing Section 504 adopted the 1991 ADAAG and permitted the Uniform Federal Accessibility Standards to be used.

²² See Federal Highway Administration, “Public Rights-of-Way Access Advisory” (January 23, 2006) at: <http://www.fhwa.dot.gov/environment/bikeped/pwaa.htm>.

implementing Title II of the Americans with Disabilities Act (hereinafter referred to as “DOJ 2010 Standards”) to the extent feasible when designing, constructing, or altering pedestrian facilities in the public right-of-way, consistent with the guidance issued by the Federal Highway Administration, as well as other applicable standards and industry practices.²³ An analysis of the proposed guidelines compared to the DOJ 2010 Standards, other applicable standards, and industry practices is included in the appendix to the regulatory assessment. The analysis consists of three tables.

Table 1. Proposed Guidelines Contain Same Requirements as in DOJ 2010 Standards

Table 1 analyzes requirements in the proposed guidelines that are the same as requirements in the DOJ 2010 Standards.²⁴ The requirements in the proposed guidelines in Table 1 will have no impacts on state and local transportation departments compared to the requirements in the DOJ 2010 Standards because the requirements are the same.

Table 2. Proposed Guidelines Adapt Requirements in DOJ 2010 Standards

Table 2 analyzes requirements in the proposed guidelines that adapt requirements in the DOJ 2010 Standards to allow for conditions and constraints in the public right-of-way.²⁵ The requirements in the proposed guidelines in Table 2 do not establish greater requirements for accessibility in the public right-of-way than the requirements in the DOJ 2010 Standards and industry practices. Some of the requirements in the proposed guidelines in Table 2 establish lesser requirements for accessibility in the public right-of-way than the requirements in the DOJ 2010 Standards. For example, where the pedestrian access route in a sidewalk is contained within the street or highway

²³ See footnote 5 regarding the DOJ 2010 standards and effective dates.

²⁴ The requirements analyzed in Table 1 include: Drinking fountains, public toilet facilities, tables, counters, passenger loading zones, ramps, stairways, handrails, doors, doorways, gates, operable parts, clear spaces, knee and toe clearance, and reach ranges.

²⁵ The requirements analyzed in Table 2 include: Sidewalks and other pedestrian circulation paths, pedestrian street crossings, pedestrian overpasses and underpasses, pedestrian at-grade rail crossings, curb ramps and blended transitions, protruding objects, transit stops and transit shelters used by buses and light rail vehicles, on-street parking, and escalators. The requirements for transit stops and transit shelters used by buses and light vehicles are compared to the accessibility standards in the Department of Transportation regulations implementing the public transportation parts of Title II of the Americans with Disabilities Act.

right-of-way, the grade of the pedestrian access route is permitted to equal the general grade established for the adjacent street or highway to allow for typical roadway geometry instead of the running slope requirements for accessible routes on sites. The requirements in the proposed guidelines in Table 2 will have no impacts on state and local transportation departments compared to the requirements in the DOJ 2010 Standards and industry practices, except for the 2 percent maximum cross slope requirement for pedestrian access routes contained within pedestrian street crossings with stop or yield control where vehicles slow or stop before proceeding through the intersection (see R204.3 and R302.6). This requirement will have more than minimal impacts on the design and construction of new tabled intersections in hilly urban areas that contain pedestrian street crossings with stop or yield control. The impacts are analyzed in the regulatory assessment and discussed below under Cross Slope (R302.6) in the Section-by-Section Analysis.

Table 3. Proposed Guidelines Contain Requirements Not in DOJ 2010 Standards

Table 3 analyzes requirements in the proposed guidelines for which there are no corresponding requirements in the DOJ 2010 Standards.²⁶ The requirements in the proposed guidelines in Table 3 are compared to other applicable accessibility standards and the 2009 edition of Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD). Where the requirements in the proposed guidelines in Table 3 are the same as the requirements in other applicable accessibility standards or the MUTCD, the requirements will have no impacts on state and local transportation departments. Where a requirement in the proposed guidelines in Table 3 differs from a corresponding requirement in other applicable accessibility standards or there is no corresponding requirement in other applicable accessibility standards, the analysis used the following factors to identify whether the requirement will have more than minimal impacts on

state and local transportation departments:

- Whether the requirement can be easily incorporated into the design of the element or facility?
- Whether the requirement adds features to the element or facility?
- Whether the requirement reduces space needed for other purposes?
- What are the additional costs due to the requirement compared to the total design and construction costs for the element or facility?

A requirement that can be easily incorporated into the design of an element or facility, and does not add features to the element or facility or reduce space needed for other purposes will have minimal impacts on state and local transportation departments. A requirement that cannot be easily incorporated into the design of an element or facility, adds features to the element or facility, or reduces space needed for other purposes and that results in additional costs compared to the total design and construction costs of the element or facility which are not negligible (*i.e.*, are worth considering) will have more than minimal impacts on state and local transportation departments.

The analysis identified three requirements in the proposed guidelines in Table 3 that will have more than minimal impacts on state and local transportation departments:

- Detectable warning surfaces on curb ramps and blended transitions at pedestrian street crossings (see R208.1 and R305);
- Accessible pedestrian signals and pedestrian pushbuttons (see R209); and
- Pedestrian activated signals at roundabout intersections with multi-lane pedestrian street crossings (see R206 and R306.3.2).

The impacts of these requirements are analyzed in the regulatory assessment and are discussed below under the relevant requirements in the Section-by-Section Analysis.

Question 1. Comments are requested on whether other requirements in the proposed guidelines will have more than minimal impacts on state and local transportation departments, in addition to the requirements identified in Tables 2 and 3. Comments should:

- Identify the requirement by section number or other information that identifies the specific requirement;
- Explain why the requirement will have more than minimal impacts using the factors described above or other appropriate factors; and
- Provide estimates of the additional costs due to the requirement compared

to the total design and construction costs for the element or facility.

Question 2. Comments are requested on whether the requirements in the proposed guidelines have any unintended positive or negative consequences.

Question 3. Comments are requested on alternative regulatory approaches for achieving the objectives of the Americans with Disabilities Act, Section 504, and Architectural Barriers Act to eliminate the discriminatory effects of architectural, transportation, and communication barriers in the design and construction of pedestrian facilities in the public right-of-way.

Section-by-Section Analysis

The proposed guidelines consist of four chapters. Chapter R1 addresses the application and administration of the proposed guidelines. Chapter R2 contains scoping requirements. Chapter R3 contains technical requirements. Chapter R4 contains supplementary technical requirements, which are the same as in the 2004 ADA and ABA Accessibility Guidelines with a few exceptions. The sections in each chapter are discussed below. Sections marked as “advisory” contain advisory information related to the preceding section. Advisory sections do not establish mandatory requirements. Some advisory sections reference related mandatory requirements to alert readers about those requirements.

The Access Board is committed to writing guidelines that are clear, concise, and easy to understand so that persons who use the guidelines know what is required. If any of the proposed guidelines are ambiguous or not clear, point out the problematic language in your comments so it can be improved in the final guidelines.

Chapter R1: Application and Administration

R101 Purpose

The proposed guidelines contain scoping and technical requirements to ensure that facilities for pedestrian circulation and use located in the public right-of-way are readily accessible to and usable by pedestrians with disabilities. When the guidelines are adopted, with or without additions and modifications, as accessibility standards in regulations issued by other federal agencies implementing Title II of the Americans with Disabilities Act, Section 504, and the Architectural Barriers Act, compliance with the accessibility standards is mandatory.

The proposed guidelines do not address existing facilities unless they

²⁶ The requirements analyzed in Table 3 include: Alternate pedestrian access routes, pedestrian signal phase timing, accessible pedestrian signals and pedestrian pushbuttons, pedestrian street crossings at roundabouts, detectable warning surfaces on curb ramps and blended transitions at pedestrian street crossings, detectable warning surfaces on pedestrian at-grade rail crossings not located within a street or highway, pedestrian signs, and benches.

are included within the scope of an alteration to an existing facility undertaken at the discretion of a covered entity. The Department of Justice regulations implementing Title II of the Americans with Disabilities Act contain requirements for state and local governments regarding program accessibility and existing facilities. See 28 CFR 35.150. The Department of Transportation regulations implementing Section 504 also contain requirements for recipients of federal financial assistance from the Department regarding compliance planning. See 49 CFR 27.11(c). As discussed above under the Major Issues, transportation officials who commented on the 2002 draft guidelines expressed concern about existing facilities that are not altered. When the Department of Justice and Department of Transportation conduct rulemaking to include accessibility standards for pedestrian facilities in the public right-of-way in regulations implementing Title II of the Americans with Disabilities Act and Section 504, they will address the application of the accessibility standards to existing facilities that are not altered. Comments concerning existing facilities that are not altered should be directed to the Department of Justice and Department of Transportation when they conduct rulemaking to include accessibility standards for pedestrian facilities in the public right-of-way in regulations implementing Title II of the Americans with Disabilities Act and Section 504.

R102 Equivalent Facilitation

The use of alternative designs, products, or technologies that result in substantially equivalent or greater accessibility and usability than the proposed guidelines is permitted.

R103 Conventions

Conventional industry tolerances apply where dimensions are not stated as a range. Where the required number of accessible facilities or elements is based on ratios or percentages and remainders or fractions result, the next greater whole number is required. Where the required size or dimension of a facility or element is based on ratios or percentages, rounding down for values less than one half is permitted. Measurements are stated in metric and U.S. customary units, and each system of measurement is to be used independently of the other.

R104 Referenced Standards

The proposed guidelines incorporate by reference certain standards in the 2009 edition of the Manual on Uniform

Traffic Control Devices for Streets and Highways (MUTCD). The referenced MUTCD standards are discussed below under the relevant requirements regarding the provision of alternate pedestrian access routes when a pedestrian circulation path is temporarily closed, the provision of accessible pedestrian signals and pedestrian pushbuttons, and pedestrian signal phase timing. The MUTCD is available on the Federal Highway Administration Web site at: <http://mutcd.fhwa.dot.gov>.

R105 Definitions

The proposed guidelines incorporate the MUTCD definitions for the following terms: Highway, intersection, island, median, pedestrian, roundabout, sidewalk, splitter island, and street. The proposed guidelines define the following terms: Accessible, alteration, blended transition, cross slope, curb line, curb ramp, element, facility, grade break, operable part, pedestrian access route, pedestrian circulation path, public right-of-way, qualified historic facility, running slope, and vertical surface discontinuities. These definitions are discussed in the sections where the terms are used. Collegiate dictionaries are used to determine the meaning of terms that are not defined in the proposed guidelines, referenced MUTCD standards, or regulations issued by federal agencies that adopt the proposed guidelines as accessibility standards. Singular and plural words, terms, and phrases are used interchangeably.

Chapter R2: Scoping Requirements

Scoping requirements specify what pedestrian facilities must comply with the proposed guidelines. Some of the scoping requirements are triggered where certain pedestrian facilities are provided such as pedestrian signals (see R209), street furniture (see R212), transit stops and transit shelters (see R213), on-street parking (see R214), and passenger loading zones (see R215). The scoping requirements reference the technical requirements that each pedestrian facility must comply with in order to be considered accessible. The technical requirements are discussed in Chapters R3 and R4.

R201 Application

The proposed guidelines apply to newly constructed facilities, altered portions of existing facilities, and elements added to existing facilities for pedestrian circulation and use located in the public right-of-way. The proposed guidelines apply to both permanent and temporary facilities in the public right-

of-way. An advisory section provides examples of temporary facilities in the public right-of-way that are covered by the scoping requirements (*e.g.*, temporary pedestrian circulation routes around work zones and portable public toilets).

Buildings and structures in the public right-of-way that are not covered by the proposed guidelines must comply with the applicable requirements in the 2004 ADA and ABA Accessibility Guidelines. An advisory section provides examples of buildings and structures in the public right-of-way that are not covered by the proposed guidelines and must comply with the applicable requirements in the 2004 ADA and ABA Accessibility Guidelines (*e.g.*, towers and temporary performance stages and reviewing stands).

R202 Alterations and Elements Added to Existing Facilities

The proposed guidelines apply to alterations and elements added to existing facilities. Alterations are changes to an existing facility that affect or could affect pedestrian access, circulation, or use (see R105.5). Alterations include, but are not limited to, resurfacing, rehabilitation, reconstruction, historic restoration, or changes or rearrangement of structural parts or elements of a facility. The Department of Justice and Department of Transportation may provide guidance on the meaning of the word "resurfacing" when they conduct rulemaking to include accessibility standards for pedestrian facilities in the public right-of-way in regulations implementing Title II of the Americans with Disabilities Act and Section 504. Comments requesting guidance on the meaning of the term "resurfacing" should be directed to the Department of Justice and Department of Transportation when they conduct rulemaking to include accessibility standards for pedestrian facilities in the public right-of-way in regulations implementing Title II of the Americans with Disabilities Act and Section 504.

Where elements are altered or added to existing facilities but the pedestrian circulation path to the altered or added elements is not altered, the pedestrian circulation path is not required to comply with the proposed requirements for pedestrian access routes. For example, if a new bench is installed on an existing sidewalk that has a cross slope exceeding 2 percent, the sidewalk is not required to be altered to reduce the cross slope because the bench is installed on the sidewalk. Advisory information recommends that, where possible, added elements should be

located on an existing pedestrian access route. This provision is based on similar provisions in the 2004 ADA and ABA Accessibility Guidelines which do not require the circulation path to altered elements or spaces to comply with the requirements for accessible routes where the circulation path to the altered elements or spaces is not altered (see 202.3, Exception 1; and F202.3, Exception 1).

Where existing physical constraints make it impractical for altered elements, spaces, or facilities to fully comply with new construction requirements, compliance is required to the extent practicable within the scope of the project. Existing physical constraints include, but are not limited to, underlying terrain, right-of-way availability, underground structures, adjacent developed facilities, drainage, or the presence of a notable natural or historic feature.

The 2004 ADA and ABA Accessibility Guidelines (see 202.4 and F202.4) and the Department of Justice regulations implementing Title II of the Americans with Disabilities Act (see 28 CFR 35.151(b)) include an additional requirement for facilities on sites whereby an alteration that affects or could affect the usability of or access to an area containing a "primary function" must be made so as to ensure that, to the maximum extent feasible, the "path of travel" to the altered area is accessible, unless the additional cost and scope of the alterations to provide an accessible "path of travel" are disproportionate to the cost of the alteration to the "primary function" area. The Department of Justice regulations define the terms "primary function" and "path of travel". See 28 CFR 35.151(b)(4)(i) and (ii). According to the Department of Justice regulations, a "primary function" is a major activity for which the facility is intended. "Primary function" areas include the dining area of a cafeteria, the meeting rooms in a conference center, as well as offices and other work areas in which the activities of the public entity using the facility are carried out. Mechanical rooms, boiler rooms, supply storage rooms, employee lounges or locker rooms, janitorial closets, entrances, and corridors are not "primary function" areas. Restrooms are not "primary function" areas unless the provision of restrooms is a primary purpose of the area (e.g., restrooms in highway rest stops). Alterations to windows, hardware, controls, electrical outlets, and signage are not alterations that affect the usability of or access to a "primary function" area. The Department of Justice regulations further state that a "path of travel"

includes a continuous, unobstructed way of pedestrian passage by means of which the altered area may be approached, entered, and exited, and which connects the altered area with an exterior approach (including sidewalks, streets, and parking areas), an entrance to the facility, and other parts of the facility. An accessible "path of travel" may consist of walks and sidewalks; curb ramps and other interior or exterior pedestrian ramps; clear floor paths through lobbies, corridors, rooms, and other improved areas; parking access aisles; elevators and lifts; or a combination of these elements; and also includes the restrooms, telephones, and drinking fountains serving the altered area.

The Department of Justice regulations deem the additional cost of alterations to provide an accessible "path of travel" to the altered area disproportionate when it exceeds 20 percent of the cost of the alteration to the "primary function" area. See 28 CFR 35.151(b)(4)(iii). When the additional cost of alterations to provide an accessible "path of travel" to the altered area is disproportionate, the Department of Justice regulations require the "path of travel" to be made accessible to the extent that it can be made accessible without incurring disproportionate costs (i.e., an amount equal to 20 percent of the cost of the alteration to the "primary function" area must be expended to provide an accessible "path of travel" to the altered area). See 28 CFR 35.151(b)(4)(iv). A similar requirement is not included in the proposed guidelines because of the uncertainty how the terms "primary function" and "path of travel" as defined in the Department of Justice regulations for facilities on sites would apply to pedestrian facilities in the public right-of-way. Revising the definitions of "primary function" and "path of travel" to apply to pedestrian facilities in the public right-of-way will not necessarily result in additional accessibility. For example, if an area that contains a "primary function" is defined to include sidewalks, an accessible "path of travel" would be required to the altered sidewalks, which in effect would require the cost and scope of planned sidewalk alteration projects to be increased by 20 percent. Sidewalk alteration projects can be planned to take into account the additional 20 percent scope and cost of work. For example, if a 5 block sidewalk alteration project would be planned in the absence of a requirement for an accessible "path of travel" to the altered sidewalks, imposing a requirement for an

accessible "path of travel" to the altered sidewalks could result in a 4 block sidewalk alteration project being planned and the additional 20 percent scope and cost of work would result in a 5 block sidewalk alteration project.

Transitional segments of pedestrian access routes must connect to unaltered segments of existing pedestrian circulation paths and comply with the technical requirements for pedestrian access routes to the extent practicable. Alterations must not decrease or have the effect of decreasing the accessibility of a facility or an accessible connection to an adjacent building or site below the requirements for new construction in effect at the time of the alteration.

Where the State Historic Preservation Officer or Advisory Council on Historic Preservation determines that compliance with a requirement would threaten or destroy historically significant features of a qualified historic facility, compliance is required to the extent that it does not threaten or destroy historically significant features of the facility. A qualified historic facility is a facility that is listed in or is eligible for listing in the National Register of Historic Places, or is designated as historic under state or local law (see R105.5)

R203 Machinery Spaces

Vaults, tunnels, and other spaces used by service personnel only are not required to comply with the proposed guidelines.

R204 Pedestrian Access Routes

A pedestrian access route is a continuous and unobstructed path of travel provided for pedestrians with disabilities within or coinciding with a pedestrian circulation path in the public right-of-way (see R105.5). Pedestrian access routes in the public right-of-way ensure that the transportation network used by pedestrians is accessible to pedestrians with disabilities. Pedestrian access routes in the public right-of-way are analogous to accessible routes on sites in that they connect to accessible elements, spaces, and facilities in the public right-of-way, including accessible pedestrian signals and pedestrian pushbuttons, accessible street furniture, accessible transit stops and transit shelters, accessible on-street parking spaces and parking meters and parking pay stations serving those parking spaces, and accessible passenger loading zones. Pedestrian access routes in the public right-of-way also connect to accessible routes at

building and facility site arrival points.²⁷

Pedestrian access routes must be provided within:

- Sidewalks and other pedestrian circulation paths located in the public right-of-way;
- Pedestrian street crossings and at-grade rail crossings, including medians and pedestrian refuge islands; and
- Overpasses, underpasses, bridges, and similar structures that contain pedestrian circulation paths.

Where an overpass, underpass, bridge, or similar structure is designed for pedestrian use only and the approach slope to the structure exceeds 5 percent, a ramp, elevator, limited use/limited application elevator, or platform lift must be provided. Elevators and platform lifts must be unlocked during the operating hours of the facility served.

An advisory section notes that the Federal Highway Administration has issued guidance on the obligations of state and local governments to keep pedestrian access routes open and usable throughout the year, including snow and debris removal.

R205 Alternate Pedestrian Access Routes

Alternate pedestrian access routes must be provided when a pedestrian circulation path is temporarily closed by construction, alterations, maintenance operations, or other conditions. The alternate pedestrian access route must comply with the referenced MUTCD standards. The MUTCD standards require alternate pedestrian routes to be accessible and detectable, including warning pedestrians who are blind or have low vision about sidewalk closures. Proximity-actuated audible signs are a preferred means to warn pedestrians who are blind or have low vision about sidewalk closures.

R206 Pedestrian Street Crossings

Pedestrian street crossings must comply with technical requirements in Chapter R3 that reference MUTCD standards for pedestrian signal phase timing. The technical requirements in Chapter R3 also include requirements for roundabouts and multi-lane channelized turn lanes.

R207 Curb Ramps and Blended Transitions

Curb ramps, blended transitions, or a combination of curb ramps and blended transitions must connect the pedestrian

access routes at each pedestrian street crossing. Curb ramps and blended transitions must be wholly contained within the pedestrian street crossings served. Typically, two curb ramps must be provided at each street corner. In alterations where existing physical constraints prevent two curb ramps from being installed at a street corner, a single diagonal curb ramp is permitted at the corner.

R208 Detectable Warning Surfaces

Detectable warning surfaces consist of small truncated domes built in or applied to a walking surface that are detectable underfoot. On pedestrian access routes, detectable warning surfaces indicate the boundary between a pedestrian route and a vehicular route where there is a flush rather than a curbed connection for pedestrians who are blind or have low vision. Detectable warning surfaces are not intended to provide wayfinding for pedestrians who are blind or have low vision. An advisory section provides information on streetscape designs that can make wayfinding easier. Detectable warning surfaces must be provided at the following locations on pedestrian access routes and at transit stops:

- Curb ramps and blended transitions at pedestrian street crossings;
- Pedestrian refuge islands;
- Pedestrian at-grade rail crossings not located within a street or highway;
- Boarding platforms at transit stops for buses and rail vehicles where the edges of the boarding platform are not protected by screens or guards; and
- Boarding and alighting areas at sidewalk or street level transit stops for rail vehicles where the side of the boarding and alighting areas facing the rail vehicles is not protected by screens or guards.

Detectable warning surfaces are not required at pedestrian refuge islands that are cut-through at street level and are less than 1.8 meters (6 feet) in length in the direction of pedestrian travel because detectable warning surfaces must extend 610 millimeters (2 feet) minimum on each side of the island and be separated by a 610 millimeters (2 feet) minimum length of island without detectable warning surfaces (see R305.1.4 and R305.2.4). Installing detectable warning surfaces at cut-through pedestrian islands that are less than 1.8 meters (6 feet) in length would compromise the effectiveness of detectable warning surfaces. An advisory section recommends that where a cut-through pedestrian island is less than 1.8 meters (6 feet) in length and the pedestrian street crossing is

signalized, the signal should be timed for a complete crossing of the street.

Comments From Individuals Who Are Blind or Have Low Vision

The National Federation of the Blind was a member of the advisory committee that recommended the proposed guidelines, but filed a minority report recommending detectable warning surfaces should be required only on curb ramps with slopes of 6.6 percent or less, and at medians and pedestrian refuge islands. Comments on the 2002 draft guidelines from individuals who identified themselves as blind or having low vision supported requiring detectable warning surfaces on all curb ramps by a margin of 2:1.

Detectable Warning Surfaces on Curb Ramps

When the Access Board issued the 1991 ADAAG, the guidelines contained a requirement for detectable warning surfaces on curb ramps. The requirement was temporarily suspended between 1994 and 2001 pending additional research and review of issues relating to requirement. The Access Board deferred addressing detectable warning surfaces on curb ramps in the 2004 ADA and ABA Accessibility Guidelines pending completion of the guidelines for pedestrian facilities in the public right-of-way. As a result of these actions, there are different requirements for detectable warning surfaces on curb ramps in the accessibility standards included the regulations issued by the Department of Justice implementing Title II of the Americans with Disabilities Act and by the Department of Transportation implementing Section 504.

When the Department of Justice initially issued regulations in 1991 implementing Title II of the Americans with Disabilities Act, the regulations required state and local governments to use accessibility standards (hereinafter referred to as the "DOJ 1991 Standards") that included the 1991 ADAAG which contained a requirement for detectable warning surfaces on curb ramps, or the Uniform Federal Accessibility Standards (UFAS) which did not contain a requirement for detectable warning surfaces on curb ramps.²⁸ When the Department of Justice adopted the DOJ 2010 Standards, those standards included the 2004 ADA and ABA Accessibility Guidelines which do not

²⁷ The ADA and ABA Accessibility Guidelines require accessible routes on sites to connect to site arrival points, including public streets and sidewalks (see 206.2.1 and F206.2.1).

²⁸ UFAS was issued in 1984 by the General Services Administration and other federal agencies responsible for issuing accessibility standards for facilities covered by the Architectural Barriers Act. See 49 FR 31528 (August 7, 1984).

contain a requirement for detectable warning surfaces on curb ramps.

The Department of Transportation regulations implementing Section 504 require state and local governments that receive federal financial assistance directly or indirectly from the Department to use accessibility standards that include the 2004 ADA and ABA Accessibility Guidelines, as modified by the Department, or UFAS. See 49 CFR 27.3(b). The Department of Transportation modified the 2004 ADA and ABA Accessibility Guidelines by retaining certain requirements from the 1991 ADAAG, including the requirement for detectable warning surfaces on curb ramps. See 406.8 in Appendix A to 49 CFR part 37.

State and local transportation departments will be affected differently by the requirement in the proposed guidelines for detectable warning surfaces on curb ramps depending on the accessibility standards that they use for curb ramps in the public right-of-way. The Access Board reviewed the standard drawings for the design of curb ramps on state transportation department Web sites and found that the transportation departments in all 50 states and the District of Columbia specify detectable warning surfaces on curb ramps in the standard drawings.²⁹ Most local transportation departments use standard drawings for the design of curb ramps that are consistent with the standard drawings maintained by their state transportation departments. These state and local transportation departments use either the DOJ 1991 Standards, which include the 1991 ADAAG requirement for detectable warning surfaces on curb ramps, or the Department of Transportation accessibility standards, which include the 2004 ADA and ABA Accessibility Guidelines as modified by the Department to include the requirement from the 1991 ADAAG for detectable warning surfaces on curb ramps.³⁰

²⁹ Links to each state transportation department's standard drawings that specify detectable warning surfaces on curb ramps are available on the Access Board Web site at: <http://www.access-board.gov/prowac/index.htm>.

³⁰ The DOJ 1991 Standards require detectable warning surfaces to extend the full width and depth of the curb ramp (see 4.7.7, Appendix E to 28 CFR part 36). The Department of Transportation standards require detectable warning surfaces to extend the full width of the curb ramp (exclusive of flared sides) and either the full depth of the curb ramp or 24 inches deep minimum measured from the back of the curb on the ramp surface (see 406.8, Appendix A to 49 CFR part 37). Guidance issued by the Department of Justice permits the use of the Department of Transportation standards for detectable warning surfaces on curb ramps. See Department of Justice, "ADA Best Practices Tool Kit for State and Local Governments, Curb Ramps and

Governmental Units Affected

State and local transportation departments are divided into four groups for the purpose of evaluating the impacts of the requirement in the proposed guidelines for detectable warning surfaces on curb ramps:

- Group 1 consists of state and local transportation departments that use UFAS for curb ramps as currently permitted by the Department of Justice and Department of Transportation regulations implementing Title II of the Americans with Disabilities Act and Section 504. UFAS did not contain a requirement for detectable warning surfaces on curb ramps. The Access Board is not aware of any state or local transportation departments that use UFAS. The Department of Justice regulations do not permit the use of UFAS on or after March 15, 2012. See 28 CFR 35.151(c)(3). Thus, Group 1 will cease to exist as of March 15, 2012, and any state and local transportation departments currently in Group 1 will fall into one of the other groups.

Question 4. The Access Board seeks information on whether any state and local transportation departments currently use UFAS for curb ramps in the public right-of-way.

- Group 2 consists of state and local transportation departments that receive federal financial assistance directly or indirectly from the Department of Transportation. State and local transportation departments in Group 2 are required to comply with the accessibility standards in the Department of Justice regulations implementing Title II of the Americans with Disabilities Act and the Department of Transportation regulations implementing Section 504. Where the requirements in the accessibility standards in the Department of Justice and Department of Transportation regulations differ, the more stringent requirement must be used. Excluding any state and local transportation departments in Group 1, state and local transportation departments in Group 2 must comply with the requirement for detectable warning surfaces on curb ramps in the Department of Transportation regulations because it is the more stringent requirement. All state transportation departments and most local transportation departments are in Group 2 and specify detectable warning surfaces on curb ramps in their standard drawings. The requirement in the proposed guidelines for detectable warning surfaces on curb ramps will not

Pedestrian Crossings" (May 7, 2006) at: <http://www.ada.gov/pcatoolkit/toolkitmain.htm>.

have any impacts on state and local transportation departments in Group 2.

- Group 3 consists of local transportation departments that do not receive federal financial assistance directly or indirectly from the Department of Transportation. Local transportation departments in Group 3 are required to comply only with the accessibility standards in the Department of Justice regulations implementing Title II of the Americans with Disabilities Act. Excluding any local transportation departments in Group 1, local transportation departments in Group 3:

- Used the DOJ 1991 Standards, which include the 1991 ADAAG and contain a requirement for detectable warning surfaces on curb ramps, before September 15, 2010. See 28 CFR 35.151(c)(1).

- Are permitted to use the DOJ 1991 Standards, which include the 1991 ADAAG and contain a requirement for detectable warning surfaces on curb ramps, or the DOJ 2010 Standards, which include the 2004 ADA and ABA Accessibility Guidelines and do not contain a requirement for detectable warnings on curb ramps, between September 15, 2010 and March 14, 2012. See 28 CFR 35.151(c)(2).

- Must use the DOJ 2010 Standards, which include the 2004 ADA and ABA Accessibility Guidelines and do not contain a requirement for detectable warnings on curb ramps, on or after March 15, 2012. See 28 CFR 35.151(c)(3).

Thus, local transportation departments in Group 3 were required to provide detectable warning surfaces on curb ramps before September 15, 2010; may or may not be required to provide detectable warning surfaces on curb ramps between September 15, 2010 and March 14, 2012 depending on the accessibility standard they use (DOJ 1991 Standards or DOJ 2010 Standards); and are not required to provide detectable warning surfaces on curb ramps on or after March 15, 2012 pending the future adoption of accessibility standards for pedestrian facilities in the public right-of-way by the Department of Justice.

Question 5. The Access Board seeks information on whether local transportation departments in Group 3 will continue or discontinue providing detectable warning surfaces on curb ramps in the public right-of-way pending the future adoption of accessibility standards for pedestrian facilities in the public right-of-way by the Department of Justice.

- Group 4 consists of state and local transportation departments that do not

comply with accessibility standards for curb ramps in the public right-of-way. The Department of Justice and Federal Highway Administration have provided guidance on accessibility standards that apply to curb ramps in the public right-of-way, including the requirement for detectable warning surfaces.³¹ Despite the guidance provided by the Department of Justice and the Federal Highway Administration on the accessibility standards that apply to curb ramps in the public right-of-way, there may be state and local transportation departments that do not comply with the standards.

Question 6. Comments are requested on whether the future adoption of accessibility standards for pedestrian facilities in the public right of way by the Department of Justice and Department of Transportation in regulations implementing Title II of the Americans with Disabilities Act and Section 504 will have a positive or negative effect, or no effect on the compliance rates of state and local transportation departments, particularly with respect to providing detectable warning surfaces on curb ramps.

Question 7. The Access Board seeks information on the number of curb ramps that are constructed or altered on an annual basis in the public right-of-way by state and local transportation departments.

Costs To Provide Detectable Warning Surfaces on Curb Ramps

Detectable warning surfaces are available in a variety of materials. The Volpe Center gathered data from local transportation departments and vendors on various detectable warning materials and estimated the costs of 8 square feet of the materials for a typical curb ramp as shown in the table below. The estimates do not include installation costs.

Detectable warning surfaces	Materials costs for typical curb ramp
Concrete pavers	\$48 to 80
Brick pavers	\$128
Polymer and composite materials.	\$120 to 200
Stainless steel or cast iron products.	\$240

Question 8. The Access Board seeks additional information on the costs for

³¹ See Department of Justice, "ADA Best Practices Tool Kit for State and Local Governments, Curb Ramps and Pedestrian Crossings" (May 7, 2006) at: <http://www.ada.gov/pccatoolkit/toolkitmain.htm>; and Federal Highway Administration, "Information on Detectable Warnings" (May 6, 2002) at: <http://www.fhwa.dot.gov/environment/bikeped/dwm.htm>.

detectable warning materials (8 square feet) and installation of the materials on a typical curb ramp.

Detectable Warning Surfaces on Boarding Platforms Used by Buses and Rail Vehicles, and Boarding and Alighting Areas Used by Rail Vehicles

The 1991 ADAAG and 2004 ADA and ABA Accessibility Guidelines contain a requirement for detectable warning surfaces on rail platforms.³² The proposed guidelines adapt this requirement to transit stops in the public right-of-way, and require detectable warning surfaces on boarding platforms at transit stops for buses and rail vehicles (*i.e.*, raised platforms used for level boarding by bus rapid transit systems and light rail systems) and at boarding and alighting areas at sidewalk or street level transit stops for rail vehicles. Detectable warning surfaces are not required where the edges of the boarding platform or the boarding and alighting areas facing the rail vehicles are protected by screens or guards.

Durability and Maintenance of Detectable Warning Surfaces

Transportation officials who commented on the 2002 draft guidelines expressed concern about the durability and maintenance of detectable warning surfaces. The National Cooperative Highway Research Program (NCHRP) has conducted two studies on the durability and maintenance of detectable warning surfaces. The first study was completed in 2005 and reviewed performance information submitted by state and local transportation departments.³³ The performance information was limited in terms of the products reviewed and time period of review (about 2 years). The study noted that there were new promising detectable warning products on the market, and recommended that test methods be developed for evaluating the long-term performance and durability of the products. The second study was completed in 2010 and recommended procedures for testing and evaluating detectable warning products.³⁴ The test methods can be used by state and local transportation departments to select detectable warning products that will

³² See 1991 ADAAG, 10.3.1(8); and 2004 ADA and ABA Accessibility Guidelines, 810.5.2.

³³ "Synthesis of Maintenance and Durability Information for Detectable Warnings on Sidewalks" March 2005 at: <http://maintenance.transportation.org/Documents/DetectableWarning20-7%28177%29.pdf>.

³⁴ "Procedures for Testing and Evaluating Detectable Warning Systems" March 2010 at: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_670.pdf.

provide long-term performance and durability under different environmental conditions. Many state and local transportation departments have evaluated and approved detectable warning products that are suited to their environments.

R209 Accessible Pedestrian Signals and Pedestrian Pushbuttons

An accessible pedestrian signal and pedestrian pushbutton is an integrated device that communicates information about the WALK and DON'T WALK intervals at signalized intersections in non-visual formats (*i.e.*, audible tones and vibrotactile surfaces) to pedestrians who are blind or have low vision. The pedestrian pushbutton has a locator tone for detecting the device and a tactile arrow to indicate which pedestrian street crossing is served by the device. The MUTCD contains standards for accessible pedestrian signals and pedestrian pushbuttons, but does not require that they be provided. The proposed guidelines require accessible pedestrian signals and pedestrian pushbuttons to be provided when new pedestrian signals are installed. For existing pedestrian signals, the proposed guidelines require accessible pedestrian signals and pedestrian pushbuttons to be provided when the signal controller and software are altered, or the signal head is replaced. Accessible pedestrian signals and pedestrian pushbuttons must comply with the referenced standards in the MUTCD and the technical requirements for operable parts in Chapter R4. Technical assistance and training on the installation of accessible pedestrian signals and pedestrian pushbuttons is available from the Access Board and transportation industry professional associations.³⁵

Comments From Individuals Who Are Blind or Have Low Vision

The National Federation of the Blind was a member of the advisory committee that recommended the proposed guidelines, but filed a minority report recommending that state and local governments consult with the local blind community to determine whether to provide accessible

³⁵ Technical assistance and training on the installation of accessible pedestrian signals are available on the following Web sites: Access Board at: <http://www.access-board.gov/research/pedestrian-signals/bulletin.htm>; Accessible Design for the Blind: http://www.accessforblind.org/aps_abt.html; Institute of Transportation Engineers at: <http://www.ite.org/education/olg.asp>; National Highway Cooperative Research Program at: <http://www.apsguide.org/>; and Transportation Research Board at: <http://www.trb.org/Main/Public/Blurbs/159938.aspx>.

pedestrian signals and pushbuttons on an intersection-by-intersection basis. Comments on the 2002 draft guidelines from individuals who identified themselves as blind or having low vision supported providing accessible pedestrian signals and pushbuttons at each signalized intersection where pedestrian signals are newly installed or replaced by a margin of 2:1.

Governmental Units Affected

The Transportation Equity Act for the 21st Century (TEA-21) directed that audible traffic signals be included in transportation plans and projects where appropriate. See 23 U.S.C. 217(g). Some state and local transportation departments currently provide accessible pedestrian signals and pedestrian pushbuttons when pedestrian signals are newly installed or replaced at signalized intersections. The requirement in the proposed guidelines for accessible pedestrian signals and pedestrian pushbuttons will have impacts on state and local transportation departments that do not currently provide accessible pedestrian signals and pedestrian pushbuttons when pedestrian signals are newly installed or replaced at signalized intersections.

Question 9. The Access Board seeks information on how many state and local transportation departments currently provide accessible pedestrian signals and pedestrian pushbuttons when pedestrian signals are newly installed or replaced at signalized intersections.

Costs To Provide Accessible Pedestrian Signals and Pedestrian Pushbuttons

The Volpe Center estimated the additional cost for an accessible pedestrian pushbutton compared to conventional pushbutton is \$350 per unit. For a typical intersection with four crosswalks, two accessible pedestrian pushbuttons would be required at each corner for a total of eight units per intersection and a total additional cost of \$2,800 for the eight units. The cost of the units is expected to decrease as a result of the proposed guidelines due to greater standardization of customer requirements and increased orders. The total additional cost to provide accessible pedestrian signals and pedestrian pushbuttons, including labor and other equipment such as stub poles and conduit, will vary by location. The Volpe Center estimated that the total additional costs are \$3,600 per intersection based on a published cost study and interviews with local transportation departments.

Question 10. The Access Board seeks information from state and local transportation departments that currently provide accessible pedestrian signals and pedestrian pushbuttons on the additional costs to provide the accessible pedestrian signals and pedestrian pushbuttons.

The Volpe Center estimated that pedestrian signals are newly installed or replaced at 13,095 signalized intersections on an annual basis based on the following assumptions:

- There are over 300,000 existing signalized intersections in the United States using a rule-of-thumb of one signalized intersection per 1,000 population.³⁶
- There are 2,550 new signalized intersections in the United States each year based on the U.S. Census Bureau forecast of future population growth (0.85 percent).
- Ninety (90) percent of new and existing signalized intersections in the United States provide pedestrian signals.
- The life cycle or replacement rate for existing pedestrian signals is 25 years.

The Volpe Center estimated that the total annual costs are \$47 million for requiring accessible pedestrian signals and pedestrian pushbuttons when pedestrian signals are newly installed or replaced at signalized intersections.

Question 11. Comments are requested on the assumptions used to estimate the total annual costs for requiring accessible pedestrian signals and pushbuttons when pedestrian signals are newly installed or replaced at signalized intersections.

R210 Protruding Objects

Objects that protrude into pedestrian circulation paths can be hazardous for pedestrians, especially pedestrians who are blind or have low vision. Objects along or overhanging any portion of a pedestrian circulation path must comply with the technical requirements for protruding objects in Chapter R4. Objects also must not reduce the clear width required for pedestrian access routes. An advisory section provides examples of street furniture and other objects that must comply with these requirements, and notes that the AASHTO "Guide for the Planning, Design, and Operation of Pedestrian Facilities" recommends that local governments regulate the use of sidewalks by private entities for activities such as outdoor dining,

vending carts and stands, and street fairs under an encroachment permit process that addresses accessibility, including protruding objects and maintaining the clear width of pedestrian access routes.

R211 Signs

Signs that provide directions, warnings, or other information for pedestrians only and signs that identify routes served by transit stops must comply with the technical requirements for visual characters in Chapter R4. An advisory section provides examples of signs that are required and are not required to comply with the technical requirements for visual characters in Chapter R4. Signs displaying the International Symbol of Accessibility must be provided at accessible parking spaces and accessible passenger loading zones.

The 2004 ADA and ABA Accessibility Guidelines contain similar requirements for transit signs (see 810.4 and 810.6). In the 2004 ADA and ABA Accessibility Guidelines, characters on bus route signs must comply with the technical requirements for character height "to the maximum extent practicable."³⁷ The phrase "to the maximum extent practicable" was intended to provide flexibility where there are restrictions on the size of signs. A similar provision is not included in the proposed guidelines because it is almost always practicable to comply with the technical requirements for character height.

Audible sign systems and other technologies are widely used today to transmit information and are more usable by pedestrians who are blind or have low vision.³⁸ Where audible sign systems and other technologies are used to transmit information equivalent to the information contained on signs, the signs are not required to comply with the technical requirements for visual characters in Chapter R4.

Question 12. The Access Board seeks information on technologies that are currently used or are under development to transmit information that is equivalent to the information contained on pedestrian signs and transit signs provided in the public right-of-way.

³⁷ The 2004 ADA and ABA Accessibility Guidelines also do not require bus route signs to comply with the technical requirements for minimum height above the ground and line spacing (see 703.5.6, 703.5.9, and 810.4).

³⁸ The ANSI approved standard "ICC A117.1-2009: Accessible and Usable Buildings and Facilities" includes technical requirements for remote infrared audible sign systems (see 703.8).

³⁶ See MUTCD "Frequently Asked Questions—Part 4—Highway Traffic Signals" at: http://mutcd.fhwa.dot.gov/knowledge/faqs/faq_part4.htm.

R212 Street Furniture

Drinking fountains, public toilet facilities, tables, and counters must comply with applicable requirements in the 2004 ADA and ABA Accessibility Guidelines. Where multiple single-user public toilet facilities are clustered at a single location, at least 5 percent, but no less than one, of the toilet facilities in each cluster must be accessible and identified by the International Symbol of Accessibility. At least 50 percent, but no less than one, of benches at each location must provide a clear space for a wheelchair adjacent to the bench. Benches at tables are not required to comply.

R213 Transit Stops and Transit Shelters

Transit stops and transit shelters must comply with the technical requirements for transit stops and transit shelters in Chapter R3. Transit stops in the public right-of-way typically serve fixed route bus systems, including bus rapid transit systems, and light rail transit systems. An advisory section notes that the Federal Highway Administration has issued guidance on the obligation of state and local transportation departments, metropolitan planning organizations, and transit agencies to coordinate the planning and funding of accessibility improvements to transit systems and facilities.

R214 On-Street Parking Spaces

Where on-street parking is provided on the block perimeter and the parking is marked or metered, a minimum number of parking spaces must be accessible and comply with the technical requirements for parking spaces in Chapter R3. For every 25 parking spaces on the block perimeter up to 100 spaces, one parking space must be accessible. For every additional 50 parking spaces on the block perimeter between 101 and 200 spaces, an additional parking space must be accessible. Where more than 200 parking spaces are provided on the block perimeter, 4 percent of the parking spaces must be accessible. Metered parking includes parking metered by parking pay stations. Where parking is metered by parking pay stations and the parking is not marked, each 6.1 meters (20 feet) of the block perimeter where parking is permitted is counted as one parking space for determining the minimum number of accessible parking spaces.

R215 Passenger Loading Zones

Where passenger loading zones are provided, at least one passenger loading zone for each 30 meters (100 feet) of

continuous loading zone space or fraction thereof must be accessible and comply with the technical requirements for passenger loading zones in Chapter R3.

R216 Stairways and Escalators

Stairways on pedestrian circulation paths must comply with technical requirements for stairways in Chapter R4. Escalators on pedestrian circulation paths must comply with the applicable technical requirements in the 2004 ADA and ABA Accessibility Guidelines. Stairways and escalators cannot be part of a pedestrian access route.

R217 Handrails

Handrails are not required on pedestrian circulation paths. However, if handrails are provided on pedestrian circulation paths, the handrails must comply with the technical requirements for handrails in Chapter R4.

R218 Doors, Doorways, and Gates

Doors, doorways, and gates to pedestrian facilities such as transit shelters must comply with applicable technical requirements in the 2004 ADA and ABA Accessibility Guidelines.

Chapter R3: Technical Requirements

Technical requirements specify what design criteria elements, spaces, and facilities must comply with in order to be considered accessible.

R301 General

The technical requirements in Chapter R3 apply where required by the scoping requirements in Chapter R2, or where referenced by another technical requirement in Chapters R3 or R4.

*R302 Pedestrian Access Routes**General (R302.1)*

The technical requirements for pedestrian access routes are contained in R302, and adapt the technical requirements for accessible routes in the 2004 ADA and ABA Accessibility Guidelines to the public right-of-way. In alterations where existing physical constraints make it impractical to fully comply with the technical requirements, compliance is required to the extent practicable within the scope of the project (see R202.3.1).

Components (R302.2)

The components of pedestrian access routes and the technical requirements for each component are listed in R302.2. Sidewalks and other pedestrian circulation paths, pedestrian street crossings, and pedestrian overpasses and underpasses and similar structures must comply with all the technical

requirements in R302.3 through R302.7. Curb ramps and blended transitions must comply with the technical requirements in R302.7 and R304. Ramps must comply with the technical requirements in R407. Elevators, limited use/limited application elevators, platform lifts, and doors, doorways, and gates must comply with applicable technical requirements in the 2004 ADA and ABA Accessibility Guidelines.

Continuous Width (R302.3)

The continuous clear width of pedestrian access routes (exclusive of the width of the curb) must be 1.2 meters (4 feet) minimum, except for medians and pedestrian refuge islands where the clear width must be 1.5 meters (5 feet) minimum in order to allow for passing space. The AASHTO "Guide for the Planning, Design, and Operation of Pedestrian Facilities" recommends that sidewalks be wider than 1.2 meters (4 feet), particularly in urban areas. Where sidewalks are wider than 1.2 meters (4 feet), only a portion of the sidewalk is required to comply with the technical requirements in R302.3 through R302.7.

The advisory committee recommended a minimum width of 1.5 meters (5 feet) for pedestrian access routes. The proposed guidelines specify a minimum width of 1.2 meters (4 feet) in order to allow for street furniture and other objects that may be located on sidewalks. R210 prohibits street furniture and other objects from reducing the clear width required for pedestrian access routes. A minimum width of 1.2 meters (4 feet) will accommodate turns at intersections and building entrances. Advisory information recommends additional maneuvering clearance at turns or changes in direction, recesses and alcoves, building entrances, and along curved or angled routes, particularly where the grade exceeds 5 percent.

Passing Spaces (R302.4)

Where the clear width of pedestrian access routes is less than 1.5 meters (5 feet), passing spaces must be provided at intervals of 61 meters (200 feet) maximum. Passing spaces must be 1.5 meters (5 feet) minimum by 1.5 meters (5 feet) minimum. Passing spaces are permitted to overlap pedestrian access routes.

Grade (R302.5)

Grade is the slope parallel to the direction of pedestrian travel. Grade is calculated by dividing the vertical change in elevation by the horizontal distance covered, and is expressed as a percent. Where pedestrian access routes

are contained within a street or highway right-of-way, the grade of the pedestrian access route is permitted to equal the general grade established for the adjacent street or highway, except that where pedestrian access routes are contained within pedestrian street crossings a maximum grade of 5 percent is required. This is consistent with the AASHTO "Policy on Geometric Design of Highways and Streets" which recommends that the sidewalk grade follow the grade of adjacent roadways, and also recommends maximum cross slopes for roadways. Where pedestrian access routes are not contained within a street or highway right-of-way, a maximum grade of 5 percent is required.

Cross Slope (R302.6)

Cross slope is the slope perpendicular to the direction of pedestrian travel (see R105.5). On a sidewalk, cross slope is measured perpendicular to the curb line or edge of the street or highway. Cross slope impedes travel by pedestrians who use wheeled mobility devices since energy must be expended to counteract the perpendicular force of the cross slope. Cross slope makes it more difficult for pedestrians who use wheelchairs to travel on uphill slopes and to maintain balance and control on downhill slopes. Cross slope also negatively affects pedestrians who use braces, lower limb prostheses, crutches, or walkers, as well as pedestrians who have gait, balance, or stamina impairments. The maximum cross slope permitted on accessible routes in the 2004 ADA and ABA Accessibility Guidelines is 2 percent. In exterior environments, a maximum cross slope of 2 percent is generally accepted as adequate to allow water to drain off paved walking surfaces.

A maximum cross slope of 2 percent is specified for pedestrian access routes, except for pedestrian access routes contained within certain pedestrian street crossings in order to allow for typical roadway geometry. A 5 percent maximum cross slope is specified for pedestrian access routes contained within pedestrian street crossings without yield or stop control to avoid any unintended negative impacts on the control and safety of vehicles, their occupants, and pedestrians in the vicinity of the intersection. Pedestrian street crossings without yield or stop control are crossings where there is no yield or stop sign, or where there is a traffic signal that is designed for the green phase. At pedestrian street crossings without yield or stop control vehicles can proceed through the intersection without slowing or stopping. The cross slope of pedestrian

access routes contained within midblock pedestrian street crossings is permitted to equal the street or highway grade.

Question 13. Comments are requested on whether the description of pedestrian street crossings without yield or stop control is clear, or whether there is a better way to describe such crossings?

In new construction, where pedestrian access routes within sidewalks intersect at corners, the 2 percent maximum cross slope requirement will result in level corners (*i.e.*, the slope at the corners will not exceed 2 percent in each direction of pedestrian travel). The level corners will provide a platform for providing level spaces for curb ramps and blended transitions, pedestrian street crossings, and accessible pedestrian signals and pedestrian pushbuttons.

Newly Constructed Tabled Intersections That Contain Pedestrian Street Crossings With Yield or Stop Control

The 2 percent maximum cross slope requirement applies to pedestrian access routes within pedestrian street crossings with yield or stop control where vehicles slow or stop before proceeding through the intersection. The cross slope of the pedestrian access route within the pedestrian street crossing is the longitudinal grade of the street being crossed, and the 2 percent maximum cross slope requirement will impact the vertical alignment of streets in the vicinity of the intersection. In new construction, street intersections in hilly urban areas are typically cut-and filled to produce relative flat or tabled intersections. Where pedestrian street crossings with yield or stop control are provided at newly constructed tabled intersections, the tabling would be extended to the pedestrian street crossings to comply with the 2 percent maximum cross slope for pedestrian access routes within the pedestrian street crossings.

Question 14. The Access Board seeks information on the current design policies and practices of state and local transportation departments with respect to tabling newly constructed intersections in hilly urban areas, and particularly whether the tabling is extended to pedestrian street crossings with yield or stop control.

In new construction, extending the tabling of intersections to pedestrian street crossings with yield or stop control involves additional costs for site preparation, grading, and earthwork. The Volpe Center roughly estimated the additional costs to extend the tabling to pedestrian street crossings with yield or

stop control to be \$60,000 per intersection based on information provided by a transportation official to the Access Board. The costs will vary by site.

Question 15. The Access Board seeks information on the additional costs to extend the tabling of newly constructed intersections in hilly urban areas to pedestrian street crossings with yield or stop control.

Question 16. The Access Board seeks information on number of tabled intersections which contain pedestrian street crossings with yield or stop control that are newly constructed in hilly urban areas on an annual basis by state and local transportation departments.

Surfaces (R302.7)

The proposed technical requirements for surfaces apply to pedestrian access routes, including curb ramps and blended transitions, and accessible elements and spaces that connect to pedestrian access routes. An advisory section lists the accessible elements and spaces that connect to pedestrian access routes and are required to comply with the technical requirements for surfaces.

The surfaces of pedestrian access routes and the surfaces at accessible elements and spaces that connect to pedestrian access routes must be firm, stable, and slip resistant. Vertical alignment of surfaces within pedestrian access routes (including curb ramp runs, blended transitions, turning spaces, and gutter areas within pedestrian access routes) and within the surfaces at accessible elements and spaces that connect to pedestrian access routes must be generally planar. Grade breaks (*i.e.*, the line where two surface planes with different grades meet, see R105.5) must be flush. Where pedestrian access routes cross rails at grade, the pedestrian access route must be level and flush with the top of the rail at the outer edges of the rails, and the surfaces between the rails must be aligned with the top of the rail.

Vertical surface discontinuities (*i.e.*, vertical difference in level between two adjacent surfaces, see R105.5) must be 13 millimeters (0.5 inch) maximum. Vertical surface discontinuities between 6.4 millimeters (0.25 inch) and 13 millimeters (0.5 inch) must be beveled with a slope not steeper than 50 percent, and the bevel must be applied across the entire vertical surface discontinuity. Horizontal openings in gratings and joints must not permit the passage of a sphere more than 13 millimeters (0.5 inch) in diameter. Elongated openings in gratings must be placed so that the

long dimension is perpendicular to the dominant direction of travel.

Flangeway gaps at pedestrian at-grade rail crossings must be 64 millimeters (2.5 inches) maximum on non-freight rail track, and 75 millimeters (3 inches) maximum on freight rail track. These are the typical gaps required to allow passage of train wheel flanges. The flangeway gaps are wider than the maximum gap allowed for horizontal openings in other surfaces. These wider flangeway gaps pose a potential safety hazard to pedestrians who use wheelchairs because the gap can entrap the wheelchair casters.³⁹ The Federal Railroad Administration is sponsoring research to develop materials or devices that will fill the flangeway gap under light loads of a wheelchair but will compress or retract when a train wheel flange passes over it.⁴⁰ The materials or devices will be tested under heavy and light train loads for safety, effectiveness, durability, and cost.

Question 17. The Access Board seeks information on materials and devices that fill the flangeway gap, and any related research and sources of expertise.

R303 Alternate Pedestrian Access Routes (See R205)

In the 2005 draft of the proposed guidelines, the technical requirements for alternate pedestrian access routes were contained in Chapter R3. The proposed guidelines reference MUTCD standards for alternate pedestrian access routes in the scoping requirements at R205. This section heading is included in Chapter R3 of the proposed guidelines to notify readers who were familiar with the 2005 draft of the proposed guidelines where to find the requirements for alternate pedestrian

access routes. This section heading will not be included in the final guidelines.

R304 Curb Ramps and Blended Transitions

General (R304.1)

Curb ramps are ramps that are cut through or built up to the curb (see R105.5). Curb ramps can be perpendicular or parallel, or a combination of parallel and perpendicular ramps. Blended transitions are raised pedestrian street crossings, depressed corners, or similar connections between the pedestrian access route at the level of the sidewalk and the level of the pedestrian street crossing that have a grade of 5 percent or less (see R105.5).

The technical requirements for curb ramps and blended transitions are contained in R304 and adapt the technical requirements for curb ramps in the 2004 ADA and ABA Accessibility Guidelines to the public right-of-way. In alterations where existing physical constraints make it impractical to fully comply with the technical requirements, compliance is required to the extent practicable within the scope of the project (see R202.3.1).

Perpendicular Curb Ramps (R304.2)

Perpendicular curb ramps have a running slope that cuts through or is built up to the curb at right angles or meets the gutter grade break at right angles where the curb is curved. On corners with a large curb radius, it will be necessary to indent the gutter grade break on one side of the curb ramp in order for the curb ramp to meet the gutter grade break at right angles.

A turning space must be provided at the top of perpendicular curb ramps. The turning space must be 1.2 meters (4 feet) minimum by 1.2 meters (4 feet) minimum, and is permitted to overlap other turning spaces and clear spaces. Where the turning space is constrained at the back of the sidewalk, the turning space must be 1.2 meters (4 feet) minimum by 1.5 meters (5 feet) minimum, with the 1.5 meters (5 feet) dimension provided in the direction of the ramp run.

A minimum running slope of 5 percent and a maximum running slope of 8.3 percent are specified for perpendicular curb ramps, and the ramp length is limited to 4.5 meters (15 feet). A maximum running slope of 2 percent is specified for the turning space at the top of the curb ramp. The running slope is measured parallel to the direction of pedestrian travel.

A maximum slope of 10 percent is specified for the flared sides of

perpendicular curb ramps where a pedestrian circulation path crosses the curb ramp. The flared sides are part of the pedestrian circulation path, but are not part of the pedestrian access route. The slope of the flared sides is measured parallel to the curb line. The 10 percent maximum slope for the flared sides is the same as in the 2004 ADA and ABA Accessibility Guidelines (see 403.6). Transportation officials have reported that the 10 percent maximum slope for the flared sides can make it difficult to provide two perpendicular curb ramps at some street corners due to the width of the flared sides at the base of the curb ramp. The Access Board is considering increasing the maximum slope for the flared sides to 12.5 percent or 16.7 percent to address this issue.

Question 18. Comments are requested on whether the maximum slope for the flared sides of perpendicular curb ramps should be increased from 10 percent to 12.5 percent or 16.7 percent, and what impact such a change would have on providing two perpendicular curb ramps at street corners. Comments are also requested on any public safety issues that may arise from increasing the maximum slope for the flared sides from 10 percent to 12.5 percent or 16.7 percent.

Parallel Curb Ramps (R304.3)

Parallel curb ramps have a running slope that is in-line with the direction of sidewalk travel and lower the sidewalk to a level turning space where a turn is made to enter the pedestrian street crossing.

A turning space must be provided at the bottom of parallel curb ramps. The turning space must be 1.2 meters (4 feet) minimum by 1.2 meters (4 feet) minimum, and is permitted to overlap other turning spaces and clear spaces. Where the turning space is constrained on two or more sides, the turning space must be 1.2 meters (4 feet) minimum by 1.5 meters (5 feet) minimum, with the 1.5 meters (5 feet) dimension provided in the direction of the pedestrian street crossing.

A minimum running slope of 5 percent and a maximum running slope of 8.3 percent are specified for parallel curb ramps, and the ramp length is limited to 4.5 meters (15 feet). A maximum running slope of 2 percent is specified for the turning space at the bottom of the curb ramp. The running slope is measured parallel to the direction of pedestrian travel.

Blended Transitions (R304.4)

A maximum running slope of 5 percent is specified for blended transitions. The running slope is

³⁹ For additional information on the potential safety hazard of flangeway gaps, see "Wheelchair Safety at Rail Level Crossings, International Review Working Paper" (2003) at [http://www.transport.vic.gov.au/DOI/DOIElect.nsf/\\$UNIDS+for+Web+Display/43D9BDF138FFE9F9CA256D630011A607/\\$FILE/Rail_Crossing_Disability_Access-International_Review.pdf](http://www.transport.vic.gov.au/DOI/DOIElect.nsf/$UNIDS+for+Web+Display/43D9BDF138FFE9F9CA256D630011A607/$FILE/Rail_Crossing_Disability_Access-International_Review.pdf); and "Rail Crossing Disability Access Kit" (2003) available at: [http://www.transport.vic.gov.au/DOI/DOIElect.nsf/\\$UNIDS+for+Web+Display/E995EA3FEB44F07CCA256D630011AD71/\\$FILE/Rail_Crossing_Disability_Access-Toolkit.pdf](http://www.transport.vic.gov.au/DOI/DOIElect.nsf/$UNIDS+for+Web+Display/E995EA3FEB44F07CCA256D630011AD71/$FILE/Rail_Crossing_Disability_Access-Toolkit.pdf).

⁴⁰ For announcement of award of research contact in 2010, see <http://www.volpe.dot.gov/sbir/ph1rec10.html> and <http://www.integrant.com/news/IT%20USA%20DOT%20Flangeway%20Gap%20SBR%20%20100323.pdf>. The Transportation Research Board has also developed research need statements for reducing flangeway gaps at railroad crossings. See "Wheelchairs Crossing Flangeway Gaps at Railroad Crossings" (2007); and "Reducing Flangeway Gaps at Railroad Crossings to Better Accommodate Pedestrians" (2008). The research need statements are available at: <http://rns.trb.org/dproject.asp?n=13462> and <http://rns.trb.org/dproject.asp?n=17644>.

measured parallel to the direction of pedestrian travel.

Common Requirements (R304.5)

The clear width of curb ramp runs (excluding flared sides), blended transitions, and turning spaces must be 1.2 meters (4 feet) minimum. Grade breaks at the top and bottom of curb ramp runs must be perpendicular to the direction of the ramp run. Grade breaks are not permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks must be flush. A maximum cross slope of 2 percent is specified for curb ramps, blended transitions, and turning spaces. At pedestrian street crossings without yield or stop control and at midblock pedestrian street crossings, the cross slope is permitted to equal the street or highway grade. The cross slope is measured perpendicular to the direction of pedestrian travel. A maximum counter slope of 5 percent is specified for the gutter or street at the foot of curb ramp runs, blended transitions, and turning spaces. A clear space must be provided beyond the bottom of the grade break that is within the width of the pedestrian street crossing and wholly outside the parallel vehicle traffic lane. The clear space must be 1.2 meters (4 feet) minimum by 1.2 meters (4 feet) minimum.

R305 Detectable Warning Surfaces

Detectable warning surfaces consist of truncated domes aligned in a square or radial grid pattern. The dimensions for dome size and dome spacing are the same as in the 2004 ADA and ABA Accessibility Guidelines. The detectable warning surfaces must contrast visually with adjacent gutter, street or highway, or pedestrian access route surface, either light-on-dark or dark-on-light. The detectable warning surfaces must extend 610 millimeters (2 feet) minimum in the direction of pedestrian travel. At curb ramps and blended transitions, detectable warning surfaces must extend the full width of the ramp run (excluding flared sides), blended transition, or turning space. At pedestrian at-grade rail crossings not located within a street or highway, detectable warning surfaces must extend the full width of the crossing. At boarding platforms for buses and rail vehicles, detectable warning surfaces must extend the full length of the public use areas of the platform. At boarding and alighting areas at sidewalk or street level transit stops for rail vehicles, detectable warning surfaces must extend the full length of the transit stop. The proposed technical requirements specify where detectable warning surfaces must

be placed on perpendicular curb ramps, parallel curb ramps, blended transitions, pedestrian refuge islands, pedestrian at-grade rail crossings, boarding platforms for buses and rail vehicles, and boarding and alighting areas at sidewalk or street level transit stops for rail vehicles.

R306 Pedestrian Street Crossings

The technical requirements in R306 address pedestrian signal phase timing and pedestrian street crossings at roundabouts and multi-lane channelized turn lanes.

Pedestrian Signal Phase Timing

Pedestrian signal phase timing must comply with referenced MUTCD standards and use a pedestrian clearance time that is calculated based on pedestrian walking speed of 1.1 meters/second (3.5 feet/second) or less.

Roundabouts

A roundabout is a circular intersection with yield control at entry, which permits a vehicle on the circulatory roadway to proceed, and with deflection of the approaching vehicle counter-clockwise around a central island (MUTCD section 1A.13). Pedestrian street crossings at roundabouts can be difficult for pedestrians who are blind or have low vision to identify because the crossings are located off to the side of the pedestrian circulation path around the street or highway. Where sidewalks are flush against the curb at roundabouts and pedestrian street crossing is not intended, a continuous and detectable edge treatment must be provided along the street side of the sidewalk at roundabouts. Detectable warning surfaces must not be used for edge treatment. Where chains, fencing, or railings are used for edge protection, the bottom edge of the treatment must be 380 millimeters (15 inches) maximum above the sidewalk to be detectable by cane.

The continuous traffic flow at roundabouts removes many of the audible cues that pedestrians who are blind use to navigate pedestrian street crossings. At roundabouts with multi-lane pedestrian street crossings, a pedestrian activated signal must be provided for each multilane segment of each crossing, including the splitter island (*i.e.*, median island used to separate opposing directions of traffic entering and exiting a roundabout, MUTCD section 1A.13). Transportation officials who commented on the 2002 draft guidelines expressed concern that signalization of roundabouts would interfere with the flow of traffic at roundabout intersections. Pedestrian

Hybrid Beacons can be used at roundabouts. See MUTCD sections 4F.01 through 4F.03. Pedestrian Hybrid Beacons are traffic signals that consist of a yellow signal centered below two horizontally aligned red signals. The signals are normally dark (*i.e.*, not illuminated). The signals are initiated only upon pedestrian activation and can be timed to minimize the interruption of traffic. The signals cease operation after the pedestrian clears the crosswalk. When activated by a pedestrian, the following signals are displayed to drivers: a flashing yellow signal, then a steady yellow signal, then two steady red signals during the pedestrian walk interval, and then alternating flashing red signals during the pedestrian clearance interval. The following signals are displayed to pedestrians: a steady upraised hand (symbolizing DON'T WALK) when the flashing or steady yellow signal is operating, then a walking person (symbolizing WALK) when the steady red signals are operating, and then a flashing upraised hand (symbolizing DON'T WALK) when the alternating flashing red signals are operating. Transportation officials may request permission from the Federal Highway Administration to experiment with alternative signals at roundabouts (see MUTCD section 1A.10).⁴¹

Multi-Lane Channelized Turn Lanes

Pedestrian activated signals must be provided at pedestrian street crossings at multi-lane channelized turn lanes at roundabouts and other signalized intersections. The pedestrian activated signals must comply with MUTCD standards for accessible pedestrian signals and pedestrian pushbuttons.

Governmental Units Affected

The requirement for pedestrian activated signals at roundabouts with multi-lane pedestrian street crossings will affect state and local transportation departments that construct new roundabouts with multi-lane pedestrian street crossings. The Volpe Center estimated that state and local transportation departments construct 27 new roundabouts with multi-lane pedestrian street crossings on an annual basis.⁴²

⁴¹ The Federal Highway Administration has granted interim approval to Rectangular Flashing Rapid Beacons, which can be used at roundabouts. However, Rectangular Flashing Rapid Beacons do not provide positive indication to drivers to stop and positive indication to pedestrians that the walk interval has been actuated. Rectangular Flashing Rapid Beacons do not meet MUTCD standards for accessible pedestrian signals and pedestrian pushbuttons.

⁴² The Volpe Center used the roundabout database at: <http://roundabout.kittelton.com/> to

Costs To Provide Pedestrian Activated Signals at Roundabouts With Multi-Lane Pedestrian Street Crossings

The Volpe Center estimated the cost to provide pedestrian activated signals at new roundabouts with multi-lane pedestrian street crossings to range from \$90,000 to \$230,000 per roundabout, and the total annual costs for requiring pedestrian activated signals at new roundabouts with multi-lane pedestrian street crossings to range from \$2.4 million to \$6.2 million.

Question 19. The Access Board seeks additional information on the number of roundabouts with multi-lane pedestrian street crossings that are newly constructed on an annual basis by state and local transportation departments, and the costs to provide pedestrian activated signals at newly constructed roundabouts with multi-lane pedestrian street crossings.

R307 Accessible Pedestrian Signals and Pedestrian Pushbuttons (See R209)

In the 2005 draft of the proposed guidelines, the technical requirements for accessible pedestrian signals and pedestrian pushbuttons were contained in Chapter R3. The proposed guidelines reference MUTCD standards for accessible pedestrian signals and pedestrian pushbuttons in the scoping requirements at R209. This section heading is included in Chapter R3 of the proposed guidelines to notify readers who were familiar with the 2005 draft of the proposed guidelines where to find the requirements for accessible pedestrian signals and pedestrian pushbuttons. This section heading will not be included in the final guidelines.

R308 Transit Stops and Transit Shelters

The technical requirements for transit stops and transit shelters are contained in R308 and adapt the technical requirements for transit facilities in the 2004 ADA and ABA Accessibility Guidelines to the public right-of-way.

Transit Stops (R308.1)

Boarding and alighting areas at sidewalk or street level transit stops must be 2.4 meters (8 feet) minimum measured perpendicular to the street or highway, and 1.5 meters (5 feet)

estimate the number of new roundabouts with multi-lane pedestrian street crossings that are constructed on an annual basis. During the five-year period between 2005 and 2009, 435 new roundabouts were constructed, of which 117 were multi-lane. The data was adjusted for a small number of roundabouts that are listed in the database as having an "unknown" number of lanes and for roundabouts that do have any pedestrian facilities (*i.e.*, sidewalks and pedestrian street crossings).

minimum measured parallel to the street or highway. The grade of the boarding and alighting area parallel to the street or highway must be equal to street or highway grade to the extent practicable. The grade of the boarding and alighting area perpendicular to the street or highway must not exceed 2 percent. Where transit stops serve vehicles with more than one car, boarding and alighting areas serving each car must comply with these requirements.

Boarding platforms at transit stops must be positioned to coordinate with vehicles to minimize the vertical and horizontal gaps. The slope of boarding platforms must not exceed 2 percent in any direction. Where boarding platforms serve vehicles operating on existing track or existing street or highway, the slope of the platform parallel to the track or street or highway is permitted to equal the grade of the track or street or highway.

The surfaces of boarding and alighting areas and boarding platforms must comply with the technical requirements for surfaces (see R302.7). Boarding and alighting areas and boarding platforms must be connected to streets, sidewalks, or pedestrian circulation paths by a pedestrian access route.

Transit Shelters (R308.2)

Transit shelters must be connected by a pedestrian access route to boarding and alighting areas or boarding platforms. A clear space (see R404) must be provided entirely within the transit shelter. Where seating is provided within transit shelters, the clear space must be located either at the end of a seat, or not overlap the area within 460 millimeters (1.5 feet) from the front edge of the seat in order to not interfere with others using the seating. Environmental controls within transit shelters must be proximity actuated. Protruding objects within transit shelters must comply with the technical requirements for protruding objects (see R402).

The Access Board is considering whether to require a turning space in transit shelters. Transit shelter designs vary. Some transit shelters are enclosed on three or four sides, with an opening for ingress and egress. The turning space would be based on the 2004 ADA and ABA Accessibility Guidelines (see 304.3).⁴³ The turning space would be

⁴³ The 2004 ADA and ABA Accessibility Guidelines require a turning space to be either a circular space 1.5 meters (5 feet) minimum in diameter, or a T-shaped space within a square with sides 1.5 meters (5 feet) minimum where the arms and base of the T-shaped space are 915 millimeters (3 feet) minimum. Each arm of the T-shaped space must be clear of obstructions 305 millimeters (1

permitted to overlap the clear space within the transit shelter and the pedestrian access route, but would not be permitted to overlap the area within 460 millimeters (1.5 feet) from the front edge of seats in the transit shelter in order to not interfere with others using the seating. The portion of the turning space that does not overlap the clear space would be permitted to be outside the transit shelter.

Question 20. Comments are requested on whether a turning space should be required in transit shelters and what impact such a requirement would have on the design and placement of transit shelters?

R309 On-Street Parking Spaces

General (R309.1)

The technical requirements for accessible on-street parking spaces are contained in R309 and adapt the technical requirements for accessible parking spaces in the 2004 ADA and ABA Accessibility Guidelines to the public right-of-way.

Parallel Parking Spaces (R309.2)

Where the adjacent sidewalk or available right-of-way is more than 4.3 meters (14 feet) wide, an access aisle must be provided at street level for the entire length of each accessible parallel parking space. The access aisle must be 1.5 meters (5 feet) wide minimum and connect to a pedestrian access route. The access aisle must not encroach on the vehicular travel lane and comply with the technical requirements for surfaces (see R302.7). In alterations where the street or sidewalk adjacent to the parking spaces is not altered, an access aisle is not required provided the parking spaces are located at the end of the block face.

Where the adjacent sidewalk or available right-of-way is less than or equal to 4.3 meters (14 feet) wide, an access aisle is not required, but accessible parallel parking spaces must be located at the end of the block face.

Perpendicular and Angled Parking Spaces (R309.3)

An access aisle must be provided at street level for the entire length of each accessible perpendicular or angled parking space. The access aisle must be 2.4 meters (8 feet) wide minimum to accommodate vans with lifts, and connect to a pedestrian access route. Two accessible parking spaces are

foot) minimum in each direction, and the base must be clear of obstructions 610 millimeters (2 feet) minimum. A circular space is permitted to include knee and toe clearance. A T-shaped space is permitted to include knee and toe clearance only at the end of either the base or one arm.

permitted to share a common access aisle. The access aisle must be marked to discourage parking in the aisle and comply with the technical requirements for surfaces (see R302.7).

Curb Ramps and Blended Transitions (R309.4)

Curb ramps or blended transitions must connect the access aisle serving each accessible on-street parking space to the pedestrian access route. Curb ramps are not permitted within the access aisle. Parking spaces at the end of block face can be served by curb ramps or blended transitions at the pedestrian street crossing. Detectable warning surfaces are not required on curb ramps and blended transitions that connect the access aisle to the sidewalk, including where the sidewalk is at the same level as the parking spaces, unless the curb ramps and blended transitions also serve pedestrian street crossings.

Parking Meters and Parking Pay Stations (R309.5)

Operable parts of parking meters and parking pay stations that serve accessible on-street parking spaces must comply with technical requirements for operable parts in Chapter R4. Displays and information must be visible from a point located 1 meter (3.3 feet) maximum above the center of the clear space in front of the parking meter or parking pay station. At accessible parallel parking spaces, parking meters must be located at the head or foot of the space.

R310 Passenger Loading Zones

The technical requirements for accessible passenger loading zones are the same as in the 2004 ADA and ABA Accessibility Guidelines. A vehicular pull-up space 2.4 meters (8 feet) wide minimum and 6.1 meters (20 feet) long minimum must be provided at accessible passenger loading zones. An access aisle must be provided at the same level as the vehicle pull-up space. The access aisle must be 1.5 meters (5 feet) wide minimum, extend the entire length of the vehicle pull-up space, and connect to the pedestrian access route. The access aisle must be marked to discourage parking in the aisle and comply with the technical requirements for surfaces (see R302.7).

Chapter R4: Supplementary Technical Requirements

Chapter R4 contains supplementary technical requirements that are the same as in the 2004 ADA and ABA Accessibility Guidelines unless otherwise noted below.

R401 General

The supplementary technical requirements in Chapter R4 apply where required by scoping requirements in Chapter R2, or where referenced by another technical requirement in Chapters R3 or R4.

R402 Protruding Objects

Objects with leading edges between 685 millimeters (2.25 feet) and 2 meters (6.7 feet) above the finish surface must not protrude into pedestrian circulation paths more than 100 millimeters (4 inches). Post-mounted objects such as signs that are between 685 millimeters (2.25 feet) and 2 meters (6.7 feet) above the finish surface must not overhang pedestrian circulation paths more than 100 millimeters (4 inches) measured horizontally from the base of the post. The post base must be 64 millimeters (2.5 inches) thick minimum. Where objects are mounted between posts and the clear distance between the posts is more than 305 millimeters (1 foot), the lowest edge of the object must be 685 millimeters (2.25 feet) minimum or 2 meters (6.7 feet) maximum above the finish surface. The requirement for post-mounted objects differs from the 2004 ADA and ABA Accessibility Guidelines but is consistent with the MUTCD which requires the bottom of signs installed on the sidewalk to be 7 feet minimum above the sidewalk, and the bottom of secondary signs (*i.e.*, signs mounted below another sign) that are lower than 7 feet above the sidewalk to project not more than 4 inches into the sidewalk (see MUTCD section 2A.18).

Guardrails or other barriers to pedestrian travel must be provided where the vertical clearance on pedestrian circulation paths is less than 2 meters (6.7 feet) high. The leading edge of the guardrail or barrier must be 685 millimeters (2.25 feet) maximum above the finish surface.

R403 Operable Parts

An operable part is a component of an element used to insert or withdraw objects, or to activate, deactivate, or adjust the element (see R105.5). The technical requirements for operable parts apply to operable parts on accessible pedestrian signals and pedestrian pushbuttons (see R209) and parking meters and parking pay stations that serve accessible parking spaces (see R309.5). A clear space must be provided at operable parts (see R404). Operable parts must be located within the reach ranges (see R406). Operable parts must be operable with one hand and not require tight grasping, pinching, or twisting of the wrist. The force required

to activate operable parts must be no more than 22 newtons (5 pounds).

R404 Clear Spaces

Clear spaces are required at operable parts (see R403.2), including accessible pedestrian signals and pedestrian pushbuttons (see R209) and parking meters and parking pay stations that serve accessible parking spaces (see R309.5). Clear spaces are also required at benches (see R212.6) and within transit shelters (see R308.2). Clear spaces must be 760 millimeters (2.5 feet) minimum by 1220 millimeters (4 feet) minimum. Additional maneuvering space must be provided where an element is confined on all or part of three sides. Clear spaces are permitted to include knee and toe clearance and to be positioned for either forward or parallel approach to an element, unless another requirement specifies otherwise. The running slope of clear spaces is permitted to be consistent with the grade of the adjacent pedestrian access route. This requirement differs from the 2004 ADA and ABA Accessibility Guidelines which does not permit slopes steeper than 2 percent at clear spaces. A 2 percent maximum cross slope is specified for clear spaces. Clear spaces must comply with the technical requirements for surfaces (see R302.7).

R405 Knee and Toe Clearance

The technical requirements for knee and toe clearance apply where space beneath an element is included as part of the clear space.

R406 Reach Ranges

Forward and side reach ranges must be between 380 millimeters (1.25 feet) and 1220 millimeters (4 feet) above the finish surface. The requirements for reach ranges differ from the 2004 ADA and ABA Accessibility Guidelines in that forward reach over an obstruction is not permitted, and side reach over an obstruction is permitted where the depth of the obstruction between the clear space and the element is 225 millimeters (10 inches) maximum.

R407 Ramps

R408 Stairways

R409 Handrails

R410 Visual Characters on Signs

R411 International Symbol of Accessibility

The technical requirements ramps, stairways, handrails, visual characters on signs, and the International Symbol of Accessibility are the same as in the

2004 ADA and ABA Accessibility Guidelines.

Other Issues

Rollability and Smoothness of Walking Surfaces

Rollability refers to the ease and comfort with which pedestrians using wheelchairs and other wheeled mobility devices can travel on walking surfaces. Rough or jointed walking surfaces can cause pedestrians using wheelchairs and other wheeled mobility devices to expend extra energy or pushing effort that makes it more difficult for them to use the walking surface, and the resulting surface vibration can cause discomfort or pain that may prevent them from using the walking surface all together. There are smoothness measures for road surfaces but no similar measures for walking surfaces. The Access Board is sponsoring preliminary research that will produce a plan for a test protocol and instrumentation to measure the rollability and smoothness of walking surfaces and to establish an index of surface vibration.

Question 21. The Access Board seeks information on related research and sources of expertise on measuring the rollability and smoothness of walking surfaces, including information from the medical community on the effects of surface vibration on individuals with disabilities.

Shared Streets

A shared street is a common space designed for use by pedestrians, bicyclists, and vehicles.⁴⁴ Shared streets typically do not have curbs and delineated sidewalks. Vehicles typically travel at low speeds on shared streets. Trees, planters, parking areas, and other obstacles may be placed on shared streets to slow vehicles. Shared streets can be in a commercial area or residential area. Shared streets are difficult for pedestrians who are blind or have low vision to navigate because of the absence of curbs and clearly delineated sidewalks.⁴⁵ The Pedestrian

⁴⁴ The Pedestrian and Bicycle Information Center provides information on shared streets on its Web site at: <http://www.walkinginfo.org/engineering/calming-street.cfm>.

⁴⁵ Focus groups and surveys of pedestrians who are blind or have low vision conducted in the United Kingdom and Netherlands document the difficulties that these pedestrians have using shared streets. See "The Impact of Shared Surface Streets and Shared Use Pedestrian/Cycle Paths on the Mobility and Independence of Blind and Partially Sighted People" (2010); "Shared Surface Street Design Research Project, The Issues: Report of Focus Groups" (2006); and "Shared Surface Street Design: Report of Focus Groups Held in Holland" (2006). The reports are available on the Guide Dogs

Accessibility and Movement Environment Laboratory at University College London has conducted limited research on the use of tactile surfaces to delineate the space on shared streets that is to be used exclusively by pedestrians, and not vehicles.⁴⁶ The tactile surfaces tested included raised truncated domes that, in the United States, are used as detectable warning surfaces on curb ramps and blended transitions to indicate the boundary between the pedestrian route and the vehicular route at pedestrian street crossings. Using detectable warning surfaces to facilitate wayfinding along shared streets would be expanding the use of such surfaces.

Question 22. The Access Board seeks information on the design of shared streets in the United States, and whether tactile surfaces or other design features are used to facilitate wayfinding along shared streets. The Access Board also seeks information about other research that is planned or underway on the use of tactile surfaces or other design features to facilitate wayfinding along shared streets.

Regulatory Process Matters

Executive Orders 12866 and 13563

The Office of Management and Budget has reviewed this proposed rule pursuant to Executive Orders 12866 and 13563.⁴⁷ The Access Board prepared a

for the Blind Association Web site at: <http://www.guidedogs.org.uk/sharedstreets/index.php?id=203>.

⁴⁶ "Shared Space Delineators, Are They Detectable?" (2010) at http://www.tap.iht.org/objects_store/201004/TJL%20Report%2020100415.pdf. See also "Testing Proposed Delineators to Demarcate Pedestrian Paths in a Shared Space Environment, Report of Design Trials Conducted at University College London" (2008) available on the Guide Dogs for the Blind Association Web site at: <http://www.guidedogs.org.uk/sharedstreets/index.php?id=203>.

⁴⁷ Executive Orders 12866 and 13563 establish and reaffirm principles of regulation that direct Federal agencies among other things to: "(1) Propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs (recognizing that some benefits and costs are difficult to quantify); (2) tailor its regulations to impose the least burden on society, consistent with obtaining regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations; (3) select, in choosing among alternative regulatory approaches, those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity); (4) to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt; and (5) identify and assess available alternatives to direct regulation, including providing economic incentives to encourage the desired behavior, such as user fees or marketable permits, or providing information upon which choices can be made by the public." Executive Order 13563, section 1(b).

regulatory assessment of the potential costs and benefits of the proposed rule. The regulatory assessment is available on the Access Board Web site at: <http://www.access-board.gov/prowac/index.htm>, and is also available in the regulatory docket at <http://www.regulations.gov>. The information in the regulatory assessment is discussed in the preamble under Impacts on State and Local Governments and under the relevant requirements in the Section-by-Section Analysis. The information in the regulatory assessment is also summarized in the tables below. As indicated in the tables below, the regulatory assessment does not include estimates of the total annual costs for two of the requirements in the proposed guidelines that will have more than minimal impacts because information is not available to estimate the costs. Questions are included in the preamble seeking additional information to assist the Board to estimate the total annual costs of these two requirements and to refine the cost estimates for the other requirements in the proposed guidelines. Consequently, the Access Board has not determined whether the proposed guidelines are an economically significant regulatory action.⁴⁸ The Access Board will analyze the information received in response to the questions in the preamble. When the final guidelines are issued, the Access Board will revise the regulatory assessment and determine whether the guidelines are an economically significant regulatory action.

Baseline

All state transportation departments and most local transportation departments maintain design manuals and standard drawings for improvements in the public right-of-way. The local transportation department design manuals and standard drawings are generally consistent with their state transportation department design manuals and standard drawings. State and local transportation departments use publications issued by the American Association of State and Highway Transportation Officials (AASHTO) in their design manuals and standard drawings, including the "Policy on Geometric Design of Highways and

⁴⁸ A regulatory action is economically significant if it is anticipated to "[h]ave an annual effect on the economy of \$100 million or more" or to "adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal government communities." Executive Order 12866, section 2(f)(1).

Streets” (2004) (commonly referred to as the “AASHTO Green Book”) and the “Guide for the Planning, Design, and Operation of Pedestrian Facilities” (2004) which incorporate accessibility in the design of sidewalks and other pedestrian facilities.⁴⁹ The Federal Highway Administration as part of its stewardship and oversight responsibilities has also worked with state transportation departments to incorporate accessibility in their design manuals and standards drawings. The Federal Highway Administration has issued guidance that the accessibility standards in the Department of Justice regulations implementing Title II of the Americans with Disabilities Act and the Department of Transportation regulations implementing Section 504 are to be used to the extent feasible for the design of pedestrian facilities in the

public right-of-way until new accessibility standards are adopted for these facilities.

In the absence of the proposed guidelines, the regulatory assessment assumes that state and local transportation departments will use the DOJ 2010 Standards in the Department of Justice regulations implementing Title II of the Americans with Disabilities Act to the extent feasible when designing, constructing, or altering pedestrian facilities in the public right-of-way, consistent with the guidance issued by the Federal Highway Administration, as well as other applicable standards and industry practices. An analysis of the proposed guidelines compared to the DOJ 2010 Standards, other applicable standards, and industry practices is included in the appendix to the regulatory assessment.

The analysis identified four requirements in the proposed guidelines that will have more than minimal impacts on state and local transportation departments. The factors used to identify whether the requirements in the proposed guidelines will have more than minimal impacts are discussed in the regulatory assessment and in the preamble under Impacts on State and Local Governments. The four requirements in the proposed guidelines that will have more than minimal impacts on state and local transportation departments are summarized in the table below, along with a description of the governmental units affected by proposed requirements and questions in the preamble to the proposed guidelines that seek additional information on the governmental units affected.

REQUIREMENTS IN PROPOSED GUIDELINES THAT WILL HAVE MORE THAN MINIMAL IMPACTS ON STATE AND LOCAL TRANSPORTATION DEPARTMENTS

Requirement	Governmental units affected
Detectable warning surfaces required on newly constructed and altered curb ramps and blended transitions at pedestrian street crossings (R208.1 and R305).	<p>Will affect state and local transportation departments that do not currently provide detectable warning surfaces on curb ramps.</p> <p>All state transportation departments currently specify detectable warning surfaces on curb ramps in their standard drawings; most local transportation departments maintain standard drawings that are consistent with standard drawings maintained by their state transportation departments.</p> <p>Questions 4, 5, and 6 in preamble seek information on state and local transportation departments that do not currently provide detectable warning surfaces on curb ramps.</p>
Accessible pedestrian signals and pushbuttons required when pedestrian signals newly installed or replaced at signalized intersections (R209).	<p>Will affect state and local transportation departments that do not currently provide accessible pedestrian signals and pedestrian pushbuttons when pedestrian signals are newly installed or replaced at signalized intersections.</p> <p>Some state and local transportation departments currently provide accessible pedestrian signals and pedestrian pushbuttons when pedestrian signals are newly installed or replaced at signalized intersections; TEA-21 (23 U.S.C. 217 (g)) directed that audible traffic signals be included in transportation plans and projects where appropriate.</p> <p>Question 9 in preamble seeks information on state and local transportation departments that currently provide accessible pedestrian signals and pedestrian pushbuttons when pedestrian signals are newly installed or replaced at signalized intersections.</p>
Maximum cross slope of 2 percent required on pedestrian access routes, including within pedestrian street crossings with yield or stop control (R204.3 and R302.6).	<p>Will affect state and local transportation departments that construct new tabled intersections in hilly urban areas which contain pedestrian street crossings with yield or stop control.</p> <p>Question 14 in preamble seeks information on the current design policies and practices of state and local transportation departments with respect to tabling newly constructed intersections in hilly urban areas, particularly with respect to extending the tabling to pedestrian street crossings with yield or stop control.</p>
Pedestrian activated signals required at roundabouts with multi-lane pedestrian crossings (R206 and R306.3.2).	<p>Will affect state and local transportation departments that construct new roundabouts with multi-lane pedestrian street crossings.</p>

The Access Board entered into an interagency agreement with the Volpe National Transportation Systems Center (Volpe Center) to gather data and

prepare cost estimates for the regulatory assessment. The cost estimates prepared by the Volpe Center are summarized in the table below, along with questions in

the preamble to the proposed guidelines that seek additional information to refine the cost estimates.

⁴⁹ See footnote 20 for additional information on the AASHTO publications and accessibility.

ESTIMATED TOTAL ANNUAL COSTS FOR REQUIREMENTS THAT WILL HAVE MORE THAN MINIMAL IMPACTS ON STATE AND LOCAL TRANSPORTATION DEPARTMENTS

Requirement	Additional costs per element or facility due to requirement	Number of elements or facilities constructed or altered on annual basis	Total annual costs for requirement
Detectable warning surfaces required on newly constructed and altered curb ramps and blended transitions at pedestrian street crossings (R208.1 and R305).	\$48 to \$240 for detectable warning materials for typical curb ramp.	No information available	No estimate provided.
	Question 8 in preamble seeks additional information on costs for detectable warning materials and installation of the materials on typical curb ramp.	Question 7 in preamble seeks information on number of curb ramps that are constructed or altered on an annual basis in the public right-of-way.	Total annual costs will depend on number of state and local transportation departments that do not currently provide detectable warning surfaces on curb ramps, and number of curb ramps that they construct or alter on an annual basis.
Accessible pedestrian signals and pushbuttons required when pedestrian signals newly installed or replaced at signalized intersections (R209).	\$3,600 per signalized intersection	Pedestrian signals newly installed or replaced at 13,095 signalized intersections on an annual basis.	\$47 million.
	Question 10 in preamble seeks additional information on costs for providing accessible pedestrian signals and pedestrian pushbuttons at signalized intersections.		
Maximum cross slope of 2 percent required on pedestrian access routes, including within pedestrian street crossings with yield or stop control (R204.3 and R302.6).	\$60,000 per tabled intersection	No information available	No estimate provided.
	Question 15 in preamble seeks additional information on costs to extend tabling of newly constructed intersections in hilly urban areas to pedestrian street crossings with yield or stop control.	Question 16 in preamble seeks information on number of tabled intersections which contain pedestrian street crossings with yield or stop control that are newly constructed in hilly urban areas on an annual basis.	Total annual costs will depend on number of tabled intersections which contain pedestrian street crossings with yield or stop control that are newly constructed in hilly urban areas on an annual basis.
Pedestrian activated signals required at roundabouts with multi-lane pedestrian crossings (R206 and R306.3.2).	\$90,000 to \$230,000 per roundabout.	27 new roundabouts with multi-lane pedestrian street crossings constructed on an annual basis.	\$2.4 million to \$6.2 million.
	Question 19 in preamble seeks additional information on costs to provide pedestrian activated signals at roundabouts with multi-lane pedestrian crossings.		

Benefits

The proposed guidelines will benefit pedestrians with disabilities. The U.S. Census Bureau reports that 54.4 million Americans, about one in five U.S. residents, reported some level of disability in 2005.⁵⁰ The number of individuals with disabilities is almost equal to the combined total population of California and Florida. The U.S. Census Bureau provides this breakdown of the population of people aged 15 and older:

- 27.4 million (11.9 percent) had difficulty with ambulatory activities of the lower body;
- 22.6 million people (9.8 percent) had difficulty walking a quarter of a mile;
- 21.8 million (9.4 percent) had difficulty climbing a flight of stairs;
- 10.2 million (4.4 percent) used a cane, crutches, or walker to assist with mobility;
- 3.3 million (1.4 percent) used a wheelchair or other wheeled mobility device; and
- 7.8 million (3 percent) had difficulty seeing words or letters in ordinary newspaper print, including 1.8

million who are completely unable to see.

Executive Order 13563 states that to the extent permitted by law Federal agencies must “propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs (recognizing that some benefits and costs are difficult to quantify)” and that “where appropriate and permitted by law, each agency may consider and (discuss qualitatively) values that are difficult or impossible to quantify, including equity, human dignity, fairness, and distributive impacts.” The proposed guidelines promote important societal values that are difficult or impossible to quantify. As discussed

⁵⁰ “Americans with Disabilities: 2005” (2008) available on the Web at: <http://www.census.gov/prod/2008pubs/p70-117.pdf>.

above under the Need for Rulemaking, when enacting the Americans with Disabilities Act, Congress found “the discriminatory effects of architectural, transportation, and communication barriers” to be a continuing problem that “denies people with disabilities the opportunity to compete on an equal basis and to pursue those opportunities for which our free society is justifiably famous, and costs the United States billions of dollars in unnecessary expenses resulting from dependency and nonproductivity.” 42 U.S.C. 12101(a)(5) and (9). Congress declared that “the Nation’s proper goals regarding individuals with disabilities are to assure equality of opportunity, full participation, independent living, and economic self-sufficiency.” 42 U.S.C. 12101(a)(8). The proposed guidelines promote the goals declared by Congress by eliminating the discriminatory effects of architectural, transportation, and communication barriers in the design and construction of pedestrian facilities in the public right-of-way. The proposed guidelines are also important to achieving the benefits of the other parts of the Americans with Disabilities Act. As the House Report for the Americans with Disabilities Act stated, “[t]he employment, transportation, and public accommodation sections * * * would be meaningless if people who use wheelchairs were not afforded the opportunity to travel on and between the streets.” H.R. 485, 101st Cong., 2d Sess. 84 (1990).

Question 23. Comments are requested on whether the proposed guidelines have other quantitative or qualitative benefits in addition to those discussed above.

Regulatory Flexibility Act: Initial Regulatory Flexibility Analysis

The impacts of the proposed guidelines on small governmental jurisdictions with a population of less than 50,000 are discussed below. This information is required by the Regulatory Flexibility Act (5 U.S.C. 603).

Reasons for Issuing Proposed Accessibility Guidelines

The Access Board’s current accessibility guidelines, the 2004 ADA and ABA Accessibility Guidelines, were developed primarily for buildings and facilities on sites. Some of the requirements in the 2004 ADA and ABA Accessibility Guidelines can be readily applied to pedestrian facilities in the public right-of-way, but other requirements need to be adapted for pedestrian facilities in the public right-

of-way. The proposed guidelines are developed specifically for pedestrian facilities in the public right-of-way and address conditions and constraints that exist in the public right-of-way.

Objectives of, and Legal Basis for, Proposed Accessibility Guidelines

The Access Board is required to issue accessibility guidelines by the Americans with Disabilities Act (42 U.S.C. 12204) and Section 502 of the Rehabilitation Act (29 U.S.C. 792) to ensure that newly constructed and altered facilities are readily accessible to and usable by pedestrians with disabilities.

Small Governmental Jurisdictions Affected by Proposed Accessibility Guidelines

The number of small governmental jurisdictions with a population less than 50,000 affected by the proposed guidelines is shown in the table below.

Governmental jurisdictions	Population less than 50,000
County	2,178
Municipal	18,824
Town or Township	16,371
Total	37,375

Source: U.S. Census Bureau 2002 Census of Governments available at: <http://www.census.gov/prod/2003pubs/gc021x1.pdf>.

Almost 70 percent of municipal governments (13,038) and more than 75 percent of towns and townships (12,331) have a population of less than 2,500. Many of these small governmental jurisdictions are located in rural areas, which generally do not construct pedestrian transportation networks (e.g., sidewalks, pedestrian street crossings, and pedestrian signals).

Compliance Requirements

The proposed accessibility guidelines address the design, construction, and alteration of pedestrian facilities in the public right-of-way, including sidewalks, pedestrian street crossings, pedestrian overpasses and underpasses, curb ramps and blended transitions at pedestrian street crossings, pedestrian signals, street furniture (i.e., drinking fountains, public toilet facilities, tables, counters, and benches), pedestrian signs, transit stops and transit shelters for buses and light rail vehicles, on-street parking that is marked or metered, and passenger loading zones. The Section-by-Section Analysis of the preamble describes the proposed accessibility guidelines. Compliance with the proposed accessibility guidelines is not mandatory until they

are adopted, without or without additions and modifications, as accessibility standards by other Federal agencies. There are no reporting or recordkeeping requirements.

Other Federal Rules

The Department of Justice, Department of Transportation, and General Services Administration are responsible for issuing accessibility standards that are consistent with the accessibility guidelines issued by the Access Board and are expected to conduct rulemaking to adopt the proposed guidelines, with or without additions and modifications, as accessibility standards in regulations implementing Title II of the Americans with Disabilities Act (28 CFR part 36 and 49 CFR part 37), Section 504 of the Rehabilitation Act (49 CFR part 27), and the Architectural Barriers Act (41 CFR part 102). Additional information on these laws and regulations is provided under the Statutory and Regulatory Background in the preamble to the proposed guidelines.

Significant Alternatives Which Minimize Any Significant Economic Impacts on Small Entities

The regulatory assessment analyzes the following four requirements in the proposed guidelines that will have more than minimal impacts on state and local transportation departments:

- *Detectable warning surfaces required on newly constructed and altered curb ramps and blended transitions at pedestrian street crossings (see R208.1 and R305).* Detectable warning surfaces consist of small truncated domes that are detectable underfoot. Where curb ramps or blended transitions are provided at pedestrian street crossings, detectable warning surfaces indicate the boundary between a pedestrian route and a vehicular route for pedestrians who are blind or have low vision in place of the missing curb.
- *Accessible pedestrian signals and pedestrian pushbuttons required when pedestrian signals newly installed or replaced at signalized intersections (see R209).* Accessible pedestrian signals and pedestrian pushbuttons communicate the information about the WALK and DON’T WALK intervals at signalized intersections in non-visual formats (i.e., audible tones and vibrotactile surfaces) to pedestrians who are blind or have low vision.
- *Maximum cross slope of 2 percent required on pedestrian access routes, including within pedestrian street crossings with yield or stop control.* Cross slope is the slope perpendicular to

the direction of pedestrian travel. Cross slope impedes travel by pedestrians who use wheeled mobility devices since energy must be expended to counteract the perpendicular force of the cross slope. The 2 percent maximum cross slope required on pedestrian access routes has more than minimal impacts on the construction of new tabled intersections in hilly urban areas that contain pedestrian street crossings with yield or stop control where vehicles slow or stop before proceeding through the intersection.

- *Pedestrian activated signals at roundabouts with multi-lane pedestrian street crossings.* A roundabout is a circular intersection with yield control at entry, which permits a vehicle on the circulatory roadway to proceed, and with deflection of the approaching vehicle counter-clockwise around a central island. Pedestrian activated signals are required at roundabouts with multi-lane pedestrian street crossings to facilitate crossing by pedestrians who are blind or have low vision. Small governmental jurisdictions with a population less than 50,000 are not likely to construct roundabouts with multi-lane pedestrian street crossings and will not be affected by this requirement.

There are no significant alternatives that will minimize any significant impacts of these requirements on small governmental jurisdictions and achieve the objectives of the Americans with Disabilities Act, Section 504 of the Rehabilitation Act, and the Architectural Barriers Act to eliminate the discriminatory effects of architectural, transportation, and communication barriers in the design and construction of pedestrian facilities in the public right-of-way.

Executive Order 13132: Federalism

The proposed rule adheres to the fundamental federalism principles and policy making criteria in Executive Order 13132. The proposed rule is issued under the authority of the Americans with Disabilities Act, civil rights legislation that was enacted by Congress pursuant to its authority to enforce the Fourteenth Amendment to the U.S. Constitution and to regulate commerce. The Americans with Disabilities Act was enacted “to provide a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities.” 42 U.S.C. 12101 (b) (1). The Americans with Disabilities Act recognizes the authority of State and local governments to enact and enforce laws that “provide for greater or equal protection for the rights of individuals

with disabilities than are afforded by this chapter.” 42 U.S.C. 12201 (b). The proposed rule is based on the recommendations of a Federal advisory committee which included representatives of state and local governments. The Access Board made drafts of the proposed rule available for public review and comment. State and local governments provided comments on the drafts of the proposed rule.

Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act does not apply to proposed or final rules that enforce constitutional rights of individuals or enforce statutory rights that prohibit discrimination on the basis of race, color, sex, national origin, age, handicap, or disability. Since the proposed rule is issued under the Americans with Disabilities Act, which prohibits discrimination on the basis of disability, an assessment of the rule’s effect on State, local, and tribal governments, and the private sector is not required by the Unfunded Mandates Reform Act.

List of Subjects in 36 CFR Part 1190

Buildings and facilities, Civil rights, Individuals with disabilities, Transportation.

Nancy Starnes,
Chair.

For the reasons stated in the preamble, the Access Board proposes to add part 1190 to title 36 of the Code of Federal Regulations to read as follows:

PART 1190—ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY

Sec.

1190.1 Accessibility guidelines.

Appendix to Part 1190—Accessibility

Guidelines for Pedestrian Facilities in the Public Right-of-Way

Authority: 29 U.S.C. 792 and 42 U.S.C. 12204.

§ 1190.1 Accessibility Guidelines.

The accessibility guidelines for pedestrian facilities in the public right-of-way are set forth in the appendix to this part. When the guidelines are adopted, with or without additions and modifications, as accessibility standards in regulations issued by other Federal agencies implementing the Americans with Disabilities Act, Section 504 of the Rehabilitation Act, and the Architectural Barriers Act, compliance with the accessibility standards is mandatory. A copy of the guidelines with figures is available on the Access Board Web site at: <http://www.access->

board.gov/prowac/nprm.htm. Except for the International Symbol of Accessibility in Figure R411, which is included in the appendix to this part, the figures are for illustration purposes only and do not establish requirements.

Appendix to Part 1190—Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way

CHAPTER R1: APPLICATION AND ADMINISTRATION

R101 Purpose

R101.1 General. This document contains scoping and technical requirements to ensure that facilities for pedestrian circulation and use located in the public right-of-way are readily accessible to and usable by pedestrians with disabilities. Compliance with this document is mandatory when required by regulations issued by federal agencies that include accessibility standards for the design, construction, and alteration of pedestrian facilities in the public right-of-way.

Advisory R101.1 General. Sections marked as “advisory” contain advisory information related to the preceding section. Advisory sections do not establish mandatory requirements. Some advisory sections reference related mandatory requirements to alert readers about those requirements.

R101.2 Effect on Existing Facilities. This document does not address existing facilities unless the facilities are included within the scope of an alteration undertaken at the discretion of a covered entity.

Advisory R101.2 Effect on Existing Facilities. The Department of Justice regulations implementing Title II of the Americans with Disabilities Act contain requirements for state and local governments regarding program accessibility and existing facilities. See 28 CFR 35.150. The Department of Transportation regulations implementing Section 504 of the Rehabilitation Act also contain requirements for recipients of federal financial assistance from the Department regarding compliance planning. See 49 CFR 27.11(c).

R102 Equivalent Facilitation. The use of alternative designs, products, or technologies that result in substantially equivalent or greater accessibility and usability than the requirements in this document is permitted.

R103 Conventions

R103.1 Conventional Industry Tolerances. Dimensions are subject to conventional industry tolerances except where dimensions are stated as a range.

Advisory R103.1.1 Conventional Industry Tolerances. Conventional industry tolerances include tolerances for field conditions and tolerances that may be a necessary consequence of a particular manufacturing process. Conventional industry tolerances do not apply to design work.

R103.2 Calculation of Percentages. Where the required number of elements or facilities to be provided is determined by calculations of ratios or percentages and remainders or fractions result, the next greater whole number of such elements or facilities shall be

provided. Where the determination of the required size or dimension of an element or facility involves ratios or percentages, rounding down for values less than one half is permitted.

R103.3 Units of Measurement.

Measurements are stated in metric and U.S. customary units. The values stated in each system (metric and U.S. customary units) may not be exact equivalents, and each system shall be used independently of the other.

Advisory R103.3 Units of Measurement. Users should work entirely within one system of measurement, either metric or U.S. customary units. Combining values from the two systems may result in non-compliance.

R104 Referenced Standards

R104.1 Incorporation by Reference. The specific editions of the standards listed in R104.2 are incorporated by reference in this document and are part of the requirements to the prescribed extent of each such reference. The Director of the Federal Register has approved the standards for incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the referenced standards may be inspected at the Access Board, 1331 F Street, NW., Suite 1000, Washington, DC 20004; or at the National Archives and Records Administration (NARA). For information on the availability of the referenced standards at NARA, call (202) 741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

R104.2 MUTCD. The portions of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), 2009 Edition, that are incorporated by reference in this document consist of definitions (see R105.2) and standard statements, as defined in section 1A.13 of the MUTCD (see R205, R209, and R306.3). Guidance, option, and support statements, as defined in section 1A.13 of the MUTCD, shall be used to assist in the interpretation of the standard statements. Where there are differences between this document and the referenced standards, this document applies. The MUTCD is available on the Federal Highway Administration Web site at <http://mutcd.fhwa.dot.gov>. Printed copies may be purchased from the American Association of State Highway and Transportation Officials, 444 N Capitol Street, NW., Washington, DC 20001 (<http://www.transportation.org/>).

Advisory R104.2 MUTCD. MUTCD definitions and standard statements are referenced in the following sections of this document:

- R105.2 references definitions in section 1A.13 of the MUTCD;
- R205 references standard statements in sections 6D.01, 6D.02, 6G.05, 6F.63, 6F.68, and 6F.71 of the MUTCD for providing alternate pedestrian access routes when a pedestrian circulation path is temporarily closed;
- R209 references standard statements in sections 4E.08 through 4E.13 of the MUTCD for accessible pedestrian signals and pedestrian pushbuttons; and

- R306.2 references standard statements in section 4E.06 of the MUTCD for pedestrian signal phase timing.

R105 Definitions

R105.1 General. For the purpose of this document, the terms defined in R105.5 have the indicated meaning.

R105.2 Terms Defined in Referenced Standards. Terms used in specific sections of the MUTCD that are incorporated by reference in this document shall have the meaning specified in section 1A.13 of the MUTCD (incorporated by reference, see R104.2). In addition, the following terms shall have the meaning specified in section 1A.13 of the MUTCD (incorporated by reference, see R104.2): highway, intersection, island, median, pedestrian, roundabout, sidewalk, splitter island, and street.

R105.3 Undefined Terms. The meaning of terms not specifically defined in R105.5, the referenced standards, or regulations issued by Federal agencies that adopt this document as accessibility standards shall be as defined by collegiate dictionaries in the sense that the context implies.

R105.4 Interchangeability. Words, terms, and phrases used in the singular include the plural and those used in the plural include the singular.

R105.5 Defined Terms.

Accessible. Describes a facility in the public right-of-way that complies with this document.

Alteration. A change to a facility in the public right-of-way that affects or could affect pedestrian access, circulation, or use. Alterations include, but are not limited to, resurfacing, rehabilitation, reconstruction, historic restoration, or changes or rearrangement of structural parts or elements of a facility.

Blended Transition. A raised pedestrian street crossing, depressed corner, or similar connection between the pedestrian access route at the level of the sidewalk and the level of the pedestrian street crossing that has a grade of 5 percent or less.

Cross Slope. The grade that is perpendicular to the direction of pedestrian travel.

Curb Line. A line at the face of the curb that marks the transition between the curb and the gutter, street, or highway.

Curb Ramp. A ramp that cuts through or is built up to the curb. Curb ramps can be perpendicular or parallel, or a combination of parallel and perpendicular ramps.

Element. An architectural or mechanical component of a building, facility, space, site, or public right-of-way.

Facility. All or any portion of buildings, structures, improvements, elements, and pedestrian or vehicular routes located in the public right-of-way.

Grade Break. The line where two surface planes with different grades meet.

Operable Part. A component of an element used to insert or withdraw objects, or to activate, deactivate, or adjust the element.

Pedestrian Access Route. A continuous and unobstructed path of travel provided for pedestrians with disabilities within or coinciding with a pedestrian circulation path.

Pedestrian Circulation Path. A prepared exterior or interior surface provided for pedestrian travel in the public right-of-way.

Public Right-of-Way. Public land or property, usually in interconnected corridors, that is acquired for or dedicated to transportation purposes.

Qualified Historic Facility. A facility that is listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate state or local law.

Running Slope. The grade that is parallel to the direction of pedestrian travel.

Vertical Surface Discontinuities. *Vertical differences in level between two adjacent surfaces.*

CHAPTER R2: SCOPING REQUIREMENTS

R201 Application

R201.1 Scope. All newly constructed facilities, altered portions of existing facilities, and elements added to existing facilities for pedestrian circulation and use located in the public right-of-way shall comply with the requirements in this document.

Advisory R201.1 Scope. The requirements in this document are to be applied to all areas of a facility within the scope of the project. Where multiple features of the same type are provided, such as on-street parking spaces, and a percentage of the features are required to be accessible, only the required number of features must comply with the technical requirements in this document and be connected to a pedestrian access route. Where elements are provided on a site that is a designated portion of a public right-of-way, the elements are required to comply with the applicable requirements in this document instead of the requirements in the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities and the Architectural Barriers Act Accessibility Guidelines (36 CFR part 1191).

R201.2 Temporary and Permanent Facilities. The requirements in this document shall apply to temporary and permanent facilities in the public right-of-way.

Advisory R201.2 Temporary and Permanent Facilities. Temporary pedestrian circulation paths around work zones and portable public toilets are examples of temporary facilities in the public right-of-way that are covered by the requirements in this document.

R201.3 Buildings and Structures. Buildings and structures in the public right-of-way that are not covered by the requirements in this document shall comply with the applicable requirements in 36 CFR part 1191.

Advisory R201.3 Buildings and Structures. Towers and temporary performance stages and reviewing stands are examples of structures that may be provided in the public right-of-way and are not covered by the requirements in this document. These structures are required to comply with the applicable requirements in the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities and the Architectural Barriers Act Accessibility Guidelines (36 CFR part 1191).

R202 Alterations and Elements Added to Existing Facilities

R202.1 General. Alterations and elements added to existing facilities shall comply with R202. Where elements are altered or added and the pedestrian circulation path to the altered or added elements is not altered, the pedestrian circulation path is not required to comply with R204.

Advisory R202.1 General. Where possible, added elements should be located on an existing pedestrian access route.

R202.2 Added Elements. Where elements are added to existing facilities, the added elements shall comply with the applicable requirements for new construction.

R202.3 Alterations. Where existing elements, spaces, or facilities are altered, each altered element, space, or facility within the scope of the project shall comply with the applicable requirements for new construction.

Advisory R202.3 Alterations. The alteration of multiple elements or spaces within a facility may provide a cost-effective opportunity to make the entire facility or a significant portion of the facility accessible.

R202.3.1 Existing Physical Constraints. Where existing physical constraints make it impracticable for altered elements, spaces, or facilities to fully comply with the requirements for new construction, compliance is required to the extent practicable within the scope of the project. Existing physical constraints include, but are not limited to, underlying terrain, right-of-way availability, underground structures, adjacent developed facilities, drainage, or the presence of a notable natural or historic feature.

R202.3.2 Transitional Segments. Transitional segments of pedestrian access routes shall connect to existing unaltered segments of pedestrian circulation paths and shall comply with R302 to the extent practicable.

R202.3.3 Reduction in Access Prohibited. An alteration shall not decrease or have the effect of decreasing the accessibility of a facility or an accessible connection to an adjacent building or site below the requirements for new construction in effect at the time of the alteration.

Advisory R202.3.3 Reduction in Access Prohibited. Sidewalk improvements that correct existing excessive cross slope should be carefully planned to avoid creating excessive slope in curb ramps or adding a step at existing building entrances. Solutions may include:

- Split sidewalks that serve building entrances and street or highway at separate levels;
- Sidewalks with greater cross slope along the curb and pedestrian access routes with lesser cross slope along building fronts;
- Pedestrian access routes along the curb and ramped entrances to buildings.

R202.3.4 Alterations to Qualified Historic Facilities. Where the State Historic Preservation Officer or Advisory Council on Historic Preservation determines that compliance with a requirement would threaten or destroy historically significant features of a qualified historic facility, compliance shall be required to the extent

that it does not threaten or destroy historically significant features of the facility.

Advisory R202.3.4 Alterations to Qualified Historic Facilities. Where there is a federal agency "undertaking", as defined in 36 CFR 800.16 (y), the requirements in section 106 of the National Historic Preservation Act (16 U.S.C. 470f) and 36 CFR part 800 apply. Location of a facility within an historic district by itself does not excuse compliance with the requirements in this document. The State Historic Preservation Officer or Advisory Council on Historic Preservation must determine that compliance would threaten or destroy historically significant features of the facility. Reproductions or replications of historic facilities are not qualified historic facilities.

R203 Machinery Spaces. Vaults, tunnels, and other spaces used by service personnel only for maintenance, repair, or monitoring are not required to comply with this document.

R204 Pedestrian Access Routes

R204.1 General. Pedestrian access routes shall be provided in accordance with R204 and shall comply with R302.

Advisory R204.1 General. The Federal Highway Administration (FHWA) has issued guidance on the obligations of state and local governments to keep pedestrian access routes open and usable throughout the year, including snow and debris removal. The guidance is available at FHWA's Web site: http://www.fhwa.dot.gov/civilrights/programs/ada_sect504qa.htm.

R204.2 Sidewalks. A pedestrian access route shall be provided within sidewalks and other pedestrian circulation paths located in the public right-of-way. The pedestrian access route shall connect to accessible elements, spaces, and facilities required by this document and to accessible routes required by section 206.2.1 of appendix B to 36 CFR part 1191 or section F206.2.1 of appendix C to 36 CFR 1191 that connect building and facility entrances to public streets and sidewalks.

Advisory R204.2 Sidewalks. The accessible elements, spaces, and facilities located in the public right-of-way that pedestrian access routes must connect to include accessible pedestrian signals and pedestrian pushbuttons (see R209), street furniture (see R212), boarding and alighting areas and boarding platforms at transit stops (see R213 and R308.1.3.2), transit shelters (see R213 and R308.2), accessible on-street parking spaces (see R214 and R309), parking meters and parking pay stations serving accessible parking spaces (see R309.6), and accessible passenger loading zones (see R215 and R310).

R204.3 Pedestrian Street Crossings. A pedestrian access route shall be provided within pedestrian street crossings, including medians and pedestrian refuge islands, and pedestrian at-grade rail crossings. The pedestrian access route shall connect departure and arrival sidewalks.

R204.4 Pedestrian Overpasses and Underpasses. A pedestrian access route shall be provided within overpasses, underpasses, bridges, and similar structures that contain pedestrian circulation paths. Where an

overpass, underpass, bridge, or similar structure is designed for pedestrian use only and the approach slope to the structure exceeds 5 percent, a ramp, elevator, limited use/limited application elevator, or platform lift shall be provided. Elevators and platform lifts shall be unlocked during the operating hours of the facility served.

Advisory R204.4 Pedestrian Overpasses and Underpasses. Where an overpass, underpass, bridge, or similar structure is designed for both pedestrian and vehicle use and the pedestrian access route is contained within the street or highway right-of-way, the grade of the pedestrian access route must not exceed the general grade established for the adjacent street or highway (see R302.5). Where the pedestrian access route is not contained within the street or highway right-of-way, the grade of the pedestrian access route must be 5 percent maximum (see R302.5). Where pedestrian overpasses or underpasses provide an alternative pedestrian circulation path to street level crossings, both the pedestrian overpass or underpass and the street level crossing must contain a pedestrian access route. State and local governments can provide a ramp, elevator, or lift at overpasses and underpasses designed for pedestrian use only. Long ramps present difficulties for some pedestrians with disabilities and can require snow clearance. Elevators or lifts can require maintenance.

R205 Alternate Pedestrian Access Routes. When a pedestrian circulation path is temporarily closed by construction, alterations, maintenance operations, or other conditions, an alternate pedestrian access route complying with sections 6D.01, 6D.02, and 6G.05 of the MUTCD (incorporated by reference, see R104.2) shall be provided. Where provided, pedestrian barricades and channelizing devices shall comply with sections 6F.63, 6F.68, and 6F.71 of the MUTCD (incorporated by reference, see R104.2).

Advisory R205 Alternate Pedestrian Access Routes. Section 6G.05 of the MUTCD recommends that whenever possible work should be done in a manner that does not create a need to detour pedestrians from existing pedestrian routes. Extra distance and additional pedestrian street crossings add complexity to a trip and increase exposure of risk to accidents. Sections 6D.01 and 6G.05 of the MUTCD require alternate pedestrian routes to be accessible and detectable, including warning pedestrians who are blind or have low vision about sidewalk closures. Proximity-actuated audible signs are a preferred means to warn pedestrians who are blind or have low vision about sidewalk closures.

R206 Pedestrian Street Crossings. Pedestrian street crossings shall comply with R306.

Advisory R206 Pedestrian Street Crossings. All pedestrian street crossings must be accessible to pedestrians with disabilities. If pedestrian crossing is prohibited at certain locations, "No Pedestrian Crossing" signs should be provided along with detectable features, such as grass strips, landscaping, planters, chains, fencing, railings, or other barriers.

R207 Curb Ramps and Blended Transitions

R207.1 General. A curb ramp, blended transition, or a combination of curb ramps and blended transitions complying with R304 shall connect the pedestrian access routes at each pedestrian street crossing. The curb ramp (excluding any flared sides) or blended transition shall be contained wholly within the width of the pedestrian street crossing served.

R207.2 Alterations. In alterations where existing physical constraints prevent compliance with R207.1, a single diagonal curb ramp shall be permitted to serve both pedestrian street crossings.

R208 Detectable Warning Surfaces

R208.1 Where Required. Detectable warning surfaces complying with R305 shall be provided at the following locations on pedestrian access routes and at transit stops:

1. Curb ramps and blended transitions at pedestrian street crossings;
2. Pedestrian refuge islands;
3. Pedestrian at-grade rail crossings not located within a street or highway;
4. Boarding platforms at transit stops for buses and rail vehicles where the edges of the boarding platform are not protected by screens or guards; and
5. Boarding and alighting areas at sidewalk or street level transit stops for rail vehicles where the side of the boarding and alighting areas facing the rail vehicles is not protected by screens or guards.

Advisory R208.1 Where Required. On pedestrian access routes, detectable warning surfaces indicate the boundary between pedestrian and vehicular routes where there is a flush rather than a curbed connection. Detectable warning surfaces should not be provided at crossings of residential driveways since the pedestrian right-of-way continues across residential driveway aprons. However, where commercial driveways are provided with yield or stop control, detectable warning surfaces should be provided at the junction between the pedestrian route and the vehicular route. Where pedestrian at-grade rail crossings are located within a street or highway, detectable warning surfaces at the curb ramps or blended transitions make a second set of detectable warning surfaces at the rail crossing unnecessary.

Detectable warning surfaces are not intended to provide wayfinding for pedestrians who are blind or have low vision. Wayfinding can be made easier by:

- Sidewalks that provide a clear path free of street furniture;
- Visual contrast between walking and non-walking areas (e.g., planted borders);
- Route edges that are clear and detectable by cane;
- Direct pedestrian street crossings and curb ramps that are in-line with direction of travel;
- Small corner radiuses that permit pedestrian street crossings to be as short and direct as possible;
- Orthogonal intersections that facilitate navigation using parallel and perpendicular vehicle sound cues; and
- Barriers where pedestrian travel or crossing is not permitted.

R208.2 Where Not Required. Detectable warning surfaces are not required at pedestrian refuge islands that are cut-through at street level and are less than 1.8 meters (6.0 ft) in length in the direction of pedestrian travel.

Advisory R208.2 Where Not Required. Detectable warning surfaces are not required at cut-through pedestrian refuge islands that are less than 1.8 meters (6.0 ft) in length because detectable warning surfaces must extend 610 millimeters (2.0 ft) minimum on each side of the island and be separated by 610 millimeters (2.0 ft) minimum length of island without detectable warning surfaces (see R305.1.4 and R305.2.4). Installing detectable warning surfaces at cut-through pedestrian islands that are less than 1.8 meters (6.0 ft) in length would compromise the effectiveness of detectable warning surfaces. Where a cut-through pedestrian refuge island is less than 1.8 m (6.0 ft) in length and the pedestrian street crossing is signalized, the signal should be timed for a complete crossing of the street.

R209 Accessible Pedestrian Signals and Pedestrian Pushbuttons

R209.1 General. Where pedestrian signals are provided at pedestrian street crossings, they shall include accessible pedestrian signals and pedestrian pushbuttons complying with sections 4E.08 through 4E.13 of the MUTCD (incorporated by reference, see R104.2). Operable parts shall comply with R406.

Advisory R209 Accessible Pedestrian Signals and Pedestrian Pushbuttons. An accessible pedestrian signal and pedestrian pushbutton is an integrated device that communicates information about the WALK and DON'T WALK intervals at signalized intersections in non-visual formats (i.e., audible tones and vibrotactile surfaces) to pedestrians who are blind or have low vision.

R209.2 Alterations. Existing pedestrian signals shall comply with R209.1 when the signal controller and software are altered, or the signal head is replaced.

R210 Protruding Objects. Objects along or overhanging any portion of a pedestrian circulation path shall comply with R402 and shall not reduce the clear width required for pedestrian access routes.

Advisory R210 Protruding Objects. Protruding objects can be hazardous for pedestrians, especially pedestrians who are blind or have low vision. The requirements for protruding objects in R402 apply across the entire width of the pedestrian circulation path, not just the pedestrian access route. In addition, objects must not reduce the clear width required for pedestrian access routes. State and local governments must comply with the requirements for protruding objects and maintain the clear width of pedestrian access routes when installing or permitting the installation of street furniture on sidewalks, including street lights, utility poles and equipment cabinets, sign posts and signs, parking meters, trash receptacles, public telephones, mailboxes, newspaper vending machines, benches, transit shelters, kiosks, bicycle racks, planters and planted trees, and street sculptures. The American Association of State Highway and

Transportation Officials (AASHTO) recommends that local governments use an encroachment permit process to regulate the use of sidewalks by private entities for activities such as outdoor dining, vending carts and stands, and street fairs in order to control protruding objects and maintain the clear width of pedestrian access routes. See AASHTO, Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004), section 3.2.3.

R211 Signs

R211.1 General. Signs shall comply with R211. Where audible sign systems and other technologies are used to provide information equivalent to the information contained on pedestrian signs and transit signs, the signs are not required to comply with R211.2 and R211.3.

Advisory R211.1 General. Audible sign systems and other technologies that provide information equivalent to the information contained on signs are more usable by pedestrians who are blind or have low vision. Remote infrared audible signs that transmit information to portable devices that are carried by and audible only to the user are an example of audible sign systems and other technologies.

R211.2 Pedestrian Signs. Signs, other than transit signs, that provide directions, warnings, or other information for pedestrians only shall comply with R410.

Advisory R211.2 Pedestrian Signs. Pedestrian route signs along an historic trail, sidewalk closure and pedestrian detour signs, and tourist information signs are examples of signs that provide directions, warnings, or other information for pedestrians only. Signs provided for motorists and pedestrians such as highway and street name signs are not required to comply with R410.

R211.3 Transit Signs. Signs that identify the routes served by transit stops shall comply with R410.

Advisory R211.3 Transit Signs. Transit schedules, timetables, and maps are not required to comply with R410.

R211.4 Accessible Parking Space and Passenger Loading Zone Signs. Accessible parking spaces and accessible passenger loading zones shall be identified by signs displaying the International Symbol of Accessibility complying with R411. At accessible parallel parking spaces and accessible passenger loading zones, the signs shall be located at the head or foot of the parking space or passenger loading zone.

R212 Street Furniture

R212.1 General. Where provided, street furniture shall comply with the applicable requirements in R212.

R212.2 Drinking Fountains. Drinking fountains shall comply with sections 602.1 through 602.6 of Appendix D to 36 CFR part 1191.

R212.3 Public Toilet Facilities. Public toilet facilities shall comply with sections 206.2.4 and 603 of Appendix D to 36 CFR part 1191. At least one fixture of each type provided shall comply with sections 604 through 610 of Appendix D to 36 CFR part 1191. Where multiple single-user public toilet facilities are clustered at a single

location, at least 5 percent, but no less than one, of single-user toilets at each cluster shall comply with R212.3 and shall be identified by the International Symbol of Accessibility complying with R411.

R212.4 Tables. At least 5 percent, but no less than one, of tables at each location shall comply with section 902 of Appendix D to 36 CFR part 1191.

R212.5 Counters. Counters shall comply with section 904 of Appendix D to 36 CFR part 1191.

R212.6 Benches. At least 50 percent, but no less than one, of benches at each location shall provide clear space complying with R404 adjacent to the bench. The clear space shall be located either at one end of the bench or shall not overlap the area within 460 mm (1.5 ft) from the front edge of the bench. Benches at tables are not required to comply.

Advisory R212.6 Benches. Benches that provide full back support and armrests to assist in sitting and standing are more usable by pedestrians with disabilities.

R213 Transit Stops and Transit Shelters. Where provided, transit stops and transit shelters shall comply with R308.

Advisory R213 Transit Stops and Transit Shelters. Transit stops in the public right-of-way typically serve fixed route bus systems, including bus rapid transit systems, and light rail transit systems. Signs that identify the routes served by the transit stop must comply with the technical requirements for visual characters on signs unless audible sign systems or other technologies are used to provide the information (see R211 and R410). The Federal Highway Administration (FHWA) has issued guidance on the obligations of state transportation departments, metropolitan planning organizations, and transit agencies to coordinate the planning and funding of accessibility improvements to transit systems and facilities. The guidance is available at FHWA's Web site: http://www.fhwa.dot.gov/civilrights/memos/ada_memo_clarificational.htm.

R214 On-Street Parking Spaces. Where on-street parking is provided on the block perimeter and the parking is marked or metered, accessible parking spaces complying with R309 shall be provided in accordance with Table R214. Where parking pay stations are provided and the parking is not marked, each 6.1 m (20.0 ft) of block perimeter where parking is permitted shall be counted as one parking space.

TABLE R214—ACCESSIBLE PARKING SPACES

Total number of marked or metered parking spaces on the block perimeter	Minimum required number of accessible parking spaces
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 and over	4% of total

Advisory R214 On-Street Parking Spaces. The MUTCD contains provisions for marking on-street parking spaces (see section 3B.19). Metered parking includes parking metered by parking pay stations. Where parking on part of the block perimeter is altered, the minimum number of accessible parking spaces required is based on the total number of marked or metered parking spaces on the block perimeter.

R215 Passenger Loading Zones. Where passenger loading zones other than transit stops are provided, at least one accessible passenger loading zone complying with R310 shall be provided for each 30 m (100.0 ft) of continuous loading zone space or fraction thereof.

R216 Stairways and Escalators. Where provided on pedestrian circulation paths, stairways shall comply with R408 and escalators shall comply with section 810.9 of Appendix D to 36 CFR part 1191. Stairways and escalators shall not be part of a pedestrian access route.

R217 Handrails. Where provided on pedestrian circulation paths, handrails shall comply with R409.

R218 Doors, Doorways, and Gates. Where provided at pedestrian facilities, doors, doorways, and gates shall comply with section 404 of Appendix D to 36 CFR part 1191.

Advisory R218 Doors, Doorways, and Gates. Enclosed transit shelters are an example of pedestrian facilities where doors and doorways are provided.

CHAPTER R3: TECHNICAL REQUIREMENTS

R301 General

R301.1 Scope. The technical requirements in Chapter 3 shall apply where required by Chapter 2 or where referenced by a requirement in this document.

R302 Pedestrian Access Routes

R302.1 General. Pedestrian access routes shall comply with R302.

R302.2 Components. Pedestrian access routes shall consist of one or more of the following components:

1. Sidewalks and other pedestrian circulation paths, or a portion of sidewalks and other pedestrian circulation paths, complying with R302.3 through R302.7;
 2. Pedestrian street crossings and at-grade rail crossings complying with R302.3 through R302.7, and R306;
 3. Pedestrian overpasses and underpasses and similar structures complying with R302.3 through R302.7;
 4. Curb ramps and blended transitions complying with R302.7 and R304;
 5. Ramps complying with R407;
 6. Elevators and limited use/limited application elevators complying with sections 407 or 408 of Appendix D to 36 CFR part 1191;
 7. Platform lifts complying with section 410 of Appendix D to 36 CFR part 1191; and
 8. Doors, doorways, and gates complying with section 404 of Appendix D to 36 CFR part 1191.
- Advisory R302.2 Components.** The technical requirement for elevators, limited use/limited application elevators, platform

lifts, and doors, doorways, and gates are contained in the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities and the Architectural Barriers Act Accessibility Guidelines (36 CFR part 1191).

R302.3 Continuous Width. Except as provided in R302.3.1, the continuous clear width of pedestrian access routes shall be 1.2 m (4.0 ft) minimum, exclusive of the width of the curb.

Advisory R302.3 Continuous Width. The continuous clear width requirements in R302.3 apply to sidewalks and other pedestrian circulation paths, pedestrian street crossings and at-grade rail crossings, and pedestrian overpasses and underpasses and similar structures (see R302.2). Clear width requirements are contained in R304.5.1 for curb ramps and blended transitions, and in R407.5 for ramps. Where sidewalks are wider than 1.2 m (4.0 ft), only a portion of the sidewalk is required to comply with the requirements in R302.3 through R302.7. Additional maneuvering space should be provided at turns or changes in direction, transit stops, recesses and alcoves, building entrances, and along curved or angled routes, particularly where the grade exceeds 5 percent. R210 prohibits street furniture and other objects from reducing the minimum clear width of pedestrian access routes.

R302.3.1 Medians and Pedestrian Refuge Islands. The clear width of pedestrian access routes within medians and pedestrian refuge islands shall be 1.5 m (5.0 ft) minimum.

R302.4 Passing Spaces. Where the clear width of pedestrian access routes is less than 1.5 m (5.0 ft), passing spaces shall be provided at intervals of 61 m (200.0 ft) maximum. Passing spaces shall be 1.5 m (5.0 ft) minimum by 1.5 m (5.0 ft) minimum. Passing spaces are permitted to overlap pedestrian access routes.

R302.5 Grade. Except as provided in R302.5.1, where pedestrian access routes are contained within a street or highway right-of-way, the grade of pedestrian access routes shall not exceed the general grade established for the adjacent street or highway. Where pedestrian access routes are not contained within a street or highway right-of-way, the grade of pedestrian access routes shall be 5 percent maximum.

Advisory R302.5 Grade. The grade requirements in R302.5 apply to sidewalks and other pedestrian circulation paths, pedestrian street crossings and at-grade rail crossings, and pedestrian overpasses and underpasses and similar structures (see R302.2). The grade of the pedestrian access route is measured parallel to the direction of pedestrian travel. Running slope requirements are contained in R304.2.2 for perpendicular curb ramps, in R304.3.2 for parallel curb ramps, in R304.4.1 for blended transitions, and in R407.2 for ramps.

R302.5.1 Pedestrian Street Crossings. Where pedestrian access routes are contained within pedestrian street crossings, the grade of the pedestrian access route shall be 5 percent maximum.

R302.6 Cross Slope. Except as provided in R302.6.1 and R302.6.2, the cross slope of pedestrian access routes shall be 2 percent maximum.

Advisory R302.6 Cross Slope. The cross slope requirements in R302.6 apply to sidewalks and other pedestrian circulation paths, pedestrian street crossings and at-grade rail crossings, and pedestrian overpasses and underpasses and similar structures (see R302.2). The cross slope of the pedestrian access route is measured perpendicular to the direction of pedestrian travel. Cross slope requirements are contained in R304.2.3 for perpendicular curb ramps, in R304.3.3 for parallel curb ramps, in R304.4.2 for blended transitions, and in R407.3 for ramps.

R302.6.1 Pedestrian Street Crossings Without Yield or Stop Control. Where pedestrian access routes are contained within pedestrian street crossings without yield or stop control, the cross slope of the pedestrian access route shall be 5 percent maximum.

Advisory R302.6.1 Pedestrian Street Crossings Without Yield or Stop Control. Pedestrian street crossings without yield or stop control are crossings where there is no yield or stop sign, or where there is a traffic signal that is designed for the green phase. At pedestrian street crossings without yield or stop control, vehicles can proceed through the intersection without slowing or stopping. Where pedestrian access routes are contained within pedestrian street crossings with yield or stop control, the cross slope of the pedestrian access route must be 2 percent maximum (see R302.6). At pedestrian street crossings with yield or stop control, vehicles slow or stop before proceeding through the intersection.

R302.6.2 Midblock Pedestrian Street Crossings. Where pedestrian access routes are contained within midblock pedestrian street crossings, the cross slope of the pedestrian access route shall be permitted to equal the street or highway grade.

R302.7 Surfaces. The surfaces of pedestrian access routes and elements and spaces required to comply with R302.7 that connect to pedestrian access routes shall be firm, stable, and slip resistant and shall comply with R302.7.

Advisory R302.7 Surfaces. The surface requirements in R302.7 apply to sidewalks and other pedestrian circulation paths, pedestrian street crossings and at-grade rail crossings, pedestrian overpasses and underpasses and similar structures, and curb ramps and blended transitions (see R302.2). The surface requirements in R302.7 also apply to surfaces at the following accessible elements and spaces that connect to pedestrian access routes:

- Clear spaces (see R404.2), including clear spaces at operable parts (see R403.2) such as accessible pedestrian signals and pedestrian pushbuttons (see R209), clear spaces at street furniture such as benches (see R212.6), and clear spaces within transit shelters (see R308.2);
- Boarding and alighting areas and boarding platforms at transit stops (see R308.1.3.1);
- Access aisles at accessible parking spaces (see R309.2.1 and R309.3) and accessible passenger loading zones (see R310.3.4); and
- Ramp runs and landings (see R407.7).

R302.7.1 Vertical Alignment. Vertical alignment shall be generally planar within

pedestrian access routes (including curb ramp runs, blended transitions, turning spaces, and gutter areas within pedestrian access routes) and surfaces at other elements and spaces required to comply with R302.7 that connect to pedestrian access routes. Grade breaks shall be flush. Where pedestrian access routes cross rails at grade, the pedestrian access route surface shall be level and flush with the top of rail at the outer edges of the rails, and the surface between the rails shall be aligned with the top of rail.

Advisory R302.7.1 Vertical Alignment. Pedestrian access route surfaces must be generally planar and smooth. Surfaces should be chosen for easy rollability. Surfaces that are heavily textured, rough, or chamfered and paving systems consisting of individual units that cannot be laid in plane will greatly increase rolling resistance and subject pedestrians who use wheelchairs, scooters, and rolling walkers to the stressful and often painful effects of vibration. Such materials should be reserved for borders and decorative accents located outside of or only occasionally crossing the pedestrian access route. Surfaces should be designed, constructed, and maintained according to appropriate industry standards, specifications, and recommendations for best practice.

R302.7.2 Vertical Surface Discontinuities. Vertical surface discontinuities shall be 13 mm (0.5 in) maximum. Vertical surface discontinuities between 6.4 mm (0.25 in) and 13 mm (0.5 in) shall be beveled with a slope not steeper than 50 percent. The bevel shall be applied across the entire vertical surface discontinuity.

Advisory R302.7.2 Vertical Surface Discontinuities. The allowance for vertical surface discontinuities is for occasional expansion joints and objects such as utility covers, vault frames, and gratings that cannot be located in another portion of the sidewalk outside the pedestrian access route. However, objects such as utility covers, vault frames, and gratings should not be located on curb ramp runs, blended transitions, turning spaces, or gutter areas within the pedestrian access route. This may not always be possible in alterations, but should be avoided wherever possible. Vertical surface discontinuities between unit pavers should be minimized.

R302.7.3 Horizontal Openings. Horizontal openings in gratings and joints shall not permit passage of a sphere more than 13 mm (0.5 in) in diameter. Elongated openings in gratings shall be placed so that the long dimension is perpendicular to the dominant direction of travel.

Advisory R302.7.4 Flangeway Gaps. Flangeway gaps at pedestrian at-grade rail crossings shall be 64 mm (2.5 in) maximum on non-freight rail track and 75 mm (3 in) maximum on freight rail track.

R302.7.4 Flangeway Gaps. Flangeway gaps are necessary to allow the passage of train wheel flanges. Flangeway gaps pose a potential hazard to pedestrians who use wheelchairs because the gaps can entrap the wheelchair casters.

R303 Alternate Pedestrian Access Routes (See R205)

R304 Curb Ramps and Blended Transitions

R304.1 General. Curb ramps and blended transitions shall comply with R304.

Advisory R304.1 General. There are two types of curb ramps:

- Perpendicular curb ramps have a running slope that cuts through or is built up to the curb at right angles or meets the gutter break at right angles where the curb is curved. On large corner radiuses, it will be necessary to indent the gutter break on one side of the curb ramp in order for the curb ramp to meet the gutter break at right angles.

- Parallel curb ramps have a running slope that is in-line with the direction of sidewalk travel and lower the sidewalk to a level turning space where a turn is made to enter the pedestrian street crossing.

Perpendicular curb ramps can be provided where the sidewalk is at least 3.7 m (12.0 ft) wide. Parallel curb ramps can be provided where the sidewalk is at least 1.2 m (4.0 ft) wide. Parallel and perpendicular curb ramps can be combined. A parallel curb ramp is used to lower the sidewalk to a mid-landing and a short perpendicular curb ramp connects the landing to the street.

Combination curb ramps can be provided where the sidewalk is at least 1.8 m (6.0 ft) wide.

Blended transitions are raised pedestrian street crossings, depressed corners, or similar connections between pedestrian access routes at the level of the sidewalk and the level of the pedestrian street crossing that have a grade of 5 percent or less. Blended transitions are suitable for a range of sidewalk conditions.

R304.2 Perpendicular Curb Ramps. Perpendicular curb ramps shall comply with R304.2 and R304.5.

R304.2.1 Turning Space. A turning space 1.2 m (4.0 ft) minimum by 1.2 m (4.0 ft) minimum shall be provided at the top of the curb ramp and shall be permitted to overlap other turning spaces and clear spaces. Where the turning space is constrained at the back-of-sidewalk, the turning space shall be 1.2 m (4.0 ft) minimum by 1.5 m (5.0 ft) minimum. The 1.5 m (5.0 ft) dimension shall be provided in the direction of the ramp run.

R304.2.2 Running Slope. The running slope of the curb ramp shall cut through or shall be built up to the curb at right angles or shall meet the gutter grade break at right angles where the curb is curved. The running slope of the curb ramp shall be 5 percent minimum and 8.3 percent maximum but shall not require the ramp length to exceed 4.5 m (15.0 ft). The running slope of the turning space shall be 2 percent maximum.

R304.2.3 Flared Sides. Where a pedestrian circulation path crosses the curb ramp, flared sides shall be sloped 10 percent maximum, measured parallel to the curb line.

Advisory R304.2.3 Flared Sides. The flared sides are part of the pedestrian circulation path, but are not part of the pedestrian access route. Curb ramps whose sides have returned curbs provide useful directional cues where they are aligned with the pedestrian street crossing and are protected from cross travel by landscaping, street furniture, chains, fencing, or railings.

R304.3 Parallel Curb Ramps. Parallel curb ramps shall comply with R304.3 and R304.5.

R304.3.1 Turning Space. A turning space 1.2 m (4.0 ft) minimum by 1.2 m (4.0 ft) minimum shall be provided at the bottom of the curb ramp and shall be permitted to overlap other turning spaces and clear spaces. If the turning space is constrained on 2 or more sides, the turning space shall be 1.2 m (4.0 ft) minimum by 1.5 m (5.0 ft). The 1.5 m (5.0 ft) dimension shall be provided in the direction of the pedestrian street crossing.

R304.3.2 Running Slope. The running slope of the curb ramp shall be in-line with the direction of sidewalk travel. The running slope of the curb ramp shall be 5 percent minimum and 8.3 percent maximum but shall not require the ramp length to exceed 4.5 m (15.0 ft) minimum. The running slope of the turning space shall be 2 percent maximum.

R304.4 Blended Transitions. Blended transitions shall comply with R304.4 and R304.5.

R304.4.1 Running Slope. The running slope of blended transitions shall be 5 percent maximum.

R304.5 Common Requirements. Curb ramps and blended transitions shall comply with R304.5.

R304.5.1 Width. The clear width of curb ramp runs (excluding any flared sides), blended transitions, and turning spaces shall be 1.2 m (4.0 ft) minimum.

R304.5.2 Grade Breaks. Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.

R304.5.3 Cross Slope. The cross slope of curb ramps, blended transitions, and turning spaces shall be 2 percent maximum. At pedestrian street crossings without yield or stop control and at midblock pedestrian street crossings, the cross slope shall be permitted to equal the street or highway grade.

Advisory R304.5.3 Cross Slope. Pedestrian street crossings without yield or stop control are crossings where there is no yield or stop sign, or where there is a traffic signal that is designed for the green phase. At pedestrian street crossings without yield or stop control, vehicles can proceed through the intersection without slowing or stopping.

R304.5.4 Counter Slope. The counter slope of the gutter or street at the foot of curb ramp runs, blended transitions, and turning spaces shall be 5 percent maximum.

R304.5.5 Clear Space. Beyond the bottom grade break, a clear space 1.2 m (4.0 ft) minimum by 1.2 m (4.0 ft) minimum shall be provided within the width of the pedestrian street crossing and wholly outside the parallel vehicle travel lane.

R305 Detectable Warning Surfaces

R305.1 General. Detectable warning surfaces shall consist of truncated domes aligned in a square or radial grid pattern and shall comply with R305.

Advisory R305.1 Dome Size. Where the truncated domes are arrayed radially, they

may differ in diameter and center-to-center spacing within the ranges specified in R305.1.1 and R305.1.2.

R305.1.1 Dome Size. The truncated domes shall have a base diameter of 23 mm (0.9 in) minimum and 36 mm (1.4 in) maximum, a top diameter of 50 percent of the base diameter minimum and 65 percent of the base diameter maximum, and a height of 5 mm (0.2 in).

R305.1.2 Dome Spacing. The truncated domes shall have a center-to-center spacing of 41 mm (1.6 in) minimum and 61 mm (2.4 in) maximum, and a base-to-base spacing of 17 mm (0.65 in) minimum, measured between the most adjacent domes.

R305.1.3 Contrast. Detectable warning surfaces shall contrast visually with adjacent gutter, street or highway, or pedestrian access route surface, either light-on-dark or dark-on-light.

Advisory R305.1.3 Contrast. Visual contrast may be provided on the full surface of the curb ramp but should not extend to flared sides. Visual contrast also helps pedestrians who use wheelchairs to locate the curb ramp from the other side of the street.

R305.1.4 Size. Detectable warning surfaces shall extend 610 mm (2.0 ft) minimum in the direction of pedestrian travel. At curb ramps and blended transitions, detectable warning surfaces shall extend the full width of the ramp run (excluding any flared sides), blended transition, or turning space. At pedestrian at-grade rail crossings not located within a street or highway, detectable warnings shall extend the full width of the crossing. At boarding platforms for buses and rail vehicles, detectable warning surfaces shall extend the full length of the public use areas of the platform. At boarding and alighting areas at sidewalk or street level transit stops for rail vehicles, detectable warning surfaces shall extend the full length of the transit stop.

R305.2 Placement. The placement of detectable warning surfaces shall comply with R305.2.

Advisory R305.2 Placement. Some detectable warning products require a concrete border for proper installation. The concrete border should not exceed 51 mm (2 in). Where the back of curb edge is tooled to provide a radius, the border dimension should be measured from the end of the radius.

R305.2.1 Perpendicular Curb Ramps. On perpendicular curb ramps, detectable warning surfaces shall be placed as follows:

1. Where the ends of the bottom grade break are in front of the back of curb, detectable warning surfaces shall be placed at the back of curb.

2. Where the ends of the bottom grade break are behind the back of curb and the distance from either end of the bottom grade brake to the back of curb is 1.5 m (5.0 ft) or less, detectable warning surfaces shall be placed on the ramp run within one dome spacing of the bottom grade break.

3. Where the ends of the bottom grade break are behind the back of curb and the distance from either end of the bottom grade brake to the back of curb is more than 1.5 m (5.0 ft), detectable warning surfaces shall be

placed on the lower landing at the back of curb.

Advisory R305.2.1 Perpendicular Curb Ramps. Detectable warning surfaces are intended to provide a tactile equivalent underfoot of the visible curb line. If detectable warning surfaces are placed too far from the curb line because of a large curb radius, the location may compromise effective crossing. Detectable warning surfaces should not be placed on paving or expansion joints. The rows of truncated domes in detectable warning surfaces should be aligned perpendicular to the grade break between the ramp run and the street so pedestrians who use wheelchairs can "track" between the domes. Where detectable warning surfaces are provided on a surface with a slope that is less than 5 percent, dome orientation is less critical.

R305.2.2 Parallel Curb Ramps. On parallel curb ramps, detectable warning surfaces shall be placed on the turning space at the flush transition between the street and sidewalk.

R305.2.3 Blended Transitions. On blended transitions, detectable warning surfaces shall be placed at the back of curb. Where raised pedestrian street crossings, depressed corners, or other level pedestrian street crossings are provided, detectable warning surfaces shall be placed at the flush transition between the street and the sidewalk.

R305.2.4 Pedestrian Refuge Islands. At cut-through pedestrian refuge islands, detectable warning surfaces shall be placed at the edges of the pedestrian island and shall be separated by a 610 mm (2.0 ft) minimum length of surface without detectable warnings.

Advisory R305.2.4 Pedestrian Refuge Islands. The edges of cut-through pedestrian refuge islands can provide useful cues to the direction of the crossing.

R305.2.5 Pedestrian At-Grade Rail Crossings. At pedestrian at-grade rail crossings not located within a street or highway, detectable warning surfaces shall be placed on each side of the rail crossing. The edge of the detectable warning surface nearest the rail crossing shall be 1.8 m (6.0 ft) minimum and 4.6 m (15.0 ft) maximum from the centerline of the nearest rail. Where pedestrian gates are provided, detectable warning surfaces shall be placed on the side of the gates opposite the rail.

R305.2.6 Boarding Platforms. At boarding platforms for buses and rail vehicles, detectable warning surfaces shall be placed at the boarding edge of the platform.

R305.2.7 Boarding and Alighting Areas. At boarding and alighting areas at sidewalk or street level transit stops for rail vehicles, detectable warning surfaces shall be placed at the side of the boarding and alighting area facing the rail vehicles.

R306 Pedestrian Street Crossings

R306.1 General. Pedestrian street crossings shall comply with R306.

R306.2 Pedestrian Signal Phase Timing. All pedestrian signal phase timing shall comply with section 4E.06 of the MUTCD (incorporated by reference, see R104.2.4) and shall be based on a pedestrian clearance time

that is calculated using a pedestrian walking speed of 1.1 m/s (3.5 ft/s) or less.

R306.3 Roundabouts. Where pedestrian facilities are provided at roundabouts, they shall comply with R306.3.

Advisory R306.3 Roundabouts. Pedestrian street crossings at roundabouts can be difficult for pedestrians who are blind or have low vision to identify because the crossings are located off to the side of the pedestrian circulation path around the street or highway. The continuous traffic flow at roundabouts removes many of the audible cues that pedestrians who are blind use to navigate pedestrian street crossings. Water fountains and other features that produce background noise should not be placed in the middle island of a roundabout because pedestrians who are blind use auditory cues to help detect gaps in traffic. Multi-lane pedestrian street crossings at roundabouts involve an increased risk of pedestrian exposure to accident.

R306.3.1 Separation. Where sidewalks are flush against the curb and pedestrian street crossing is not intended, a continuous and detectable edge treatment shall be provided along the street side of the sidewalk. Detectable warning surfaces shall not be used for edge treatment. Where chains, fencing, or railings are used for edge treatment, they shall have a bottom edge 380 mm (15 in) maximum above the sidewalk.

Advisory R306.3.1 Separation. Carefully delineated pedestrian street crossing approaches with plantings or other defined edges provide effective non-visual cues for identifying pedestrian street crossings at roundabouts. European and Australian roundabouts provide a 610 mm (24 inch) width of tactile surface treatment from the centerline of the curb ramp or blended transition across the full width of the sidewalk to provide an underfoot cue for identifying pedestrian street crossings. Detectable warning surfaces should not be used to guide pedestrians who are blind or have low vision to pedestrian street crossings because detectable warning surfaces indicate the flush transition between the sidewalk and the street or highway. Schemes that remove cyclists from the street or highway by means of a ramp that angles from the curb lane to the sidewalk and then provide re-entry by means of a similar ramp beyond pedestrian street crossings can provide false cues to pedestrians who are using the edge of the sidewalk for wayfinding about the location of pedestrian street crossings.

R306.3.2 Pedestrian Activated Signals. At roundabouts with multi-lane pedestrian street crossings, a pedestrian activated signal complying with R209 shall be provided for each multi-lane segment of each pedestrian street crossing, including the splitter island. Signals shall clearly identify which pedestrian street crossing segment the signal serves.

Advisory R306.3.2 Pedestrian Activated Signals. Roundabouts with single-lane approach and exit legs are not required to provide pedestrian activated signals. Pedestrian activated signals must comply with the requirements for accessible pedestrian signals and pedestrian pushbuttons (see R209). Pedestrian activated

signals installed at splitter islands should be carefully located and separated so that signal spillover does not give conflicting information about which pedestrian street crossing has the WALK indication displayed. Pedestrian Hybrid Beacons can be used at roundabouts (see MUTCD sections 4F.01 through 4F.03). Pedestrian Hybrid Beacons are traffic signals that consist of a yellow signal centered below two horizontally aligned red signals. The signals are normally not illuminated. The signals are initiated only upon pedestrian activation and can be timed to minimize the interruption of traffic. The signals cease operation after the pedestrian clears the crosswalk. When activated by a pedestrian, the following signals are displayed to drivers: a flashing yellow signal, then a steady yellow signal, then two steady red signals during the pedestrian walk interval, and then alternating flashing red signals during the pedestrian clearance interval. The following signals are displayed to pedestrians: a steady upraised hand (symbolizing DON'T WALK) when the flashing or steady yellow signal is operating, then a walking person (symbolizing WALK) when the steady red signals are operating, and then a flashing upraised hand (symbolizing DON'T WALK) when the alternating flashing red signals are operating.

R306.4 Channelized Turn Lanes at Roundabouts. At roundabouts with pedestrian street crossings, pedestrian activated signals complying with R209 shall be provided at pedestrian street crossings at multi-lane channelized turn lanes.

R306.5 Channelized Turn Lanes at Other Signalized Intersections. At signalized intersections other than roundabouts with pedestrian street crossings, pedestrian activated signals complying with R209 shall be provided at pedestrian street crossings at multi-lane channelized turn lanes.

R307 Accessible Pedestrian Signals and Pedestrian Pushbuttons (See R209)

R308 Transit Stops and Transit Shelters

R308.1 Transit Stops. Transit stops shall comply with R308.1.

Advisory R308.1 Transit Stops. Transit stops should be located so that there is a level and stable surface for boarding vehicles. Locating transit stops at signalized intersections increases the usability for pedestrian with disabilities. Where security bollards are installed at transit stops, they must not obstruct the clear space at boarding and alighting areas or reduce the required clear width at pedestrian access routes (see R210).

R308.1.1 Boarding and Alighting Areas. Boarding and alighting areas at sidewalk or street level transit stops shall comply with R308.1.1 and R308.1.3. Where transit stops serve vehicles with more than one car, boarding and alighting areas serving each car shall comply with R308.1.1 and R308.1.3.

Advisory R308.1.1 Boarding and Alighting Areas. Where a transit shelter is provided, the boarding and alighting area can be located either within or outside of the shelter.

R308.1.1.1 Dimensions. Boarding and alighting areas shall provide a clear length of 2.4 m (8.0 ft) minimum, measured

perpendicular to the curb or street or highway edge, and a clear width of 1.5 m (5.0 ft) minimum, measured parallel to the street or highway.

R308.1.1.2 Grade. Parallel to the street or highway, the grade of boarding and alighting areas shall be the same as the street or highway, to the extent practicable. Perpendicular to the street or highway, the grade of boarding and alighting areas shall not be steeper than 2 percent.

R308.1.2 Boarding Platforms. Boarding platforms at transit stops shall comply with R308.1.2 and R308.1.3.

R308.1.2.1 Platform and Vehicle Floor Coordination. Boarding platforms shall be positioned to coordinate with vehicles in accordance with the applicable requirements in 49 CFR parts 37 and 38.

Advisory R308.1.2.1 Platform and Vehicle Floor Coordination. The Department of Transportation regulations (49 CFR parts 37 and 38) require the height of the vehicle floor and the station platform to be coordinated so as to minimize the vertical and horizontal gaps.

R308.1.2.2 Slope. Boarding platforms shall not exceed a slope of 2 percent in any direction. Where boarding platforms serve vehicles operating on existing track or existing street or highway, the slope of the platform parallel to the track or the street or highway is permitted to be equal to the grade of the track or street or highway.

R308.1.3 Common Requirements. Boarding and alighting areas and boarding platforms shall comply with R308.1.3.

R308.1.3.1 Surfaces. The surfaces of boarding and alighting areas and boarding platforms shall comply with R302.7.

Advisory R308.1.3.1 Surfaces. Detectable warning surfaces are required at boarding and alighting areas for rail vehicles and at boarding platforms for buses and rail vehicles (see R208).

R308.1.3.2 Connection. Boarding and alighting areas and boarding platforms shall be connected to streets, sidewalks, or pedestrian circulation paths by pedestrian access routes complying with R302.

R308.2 Transit Shelters. Transit shelters shall be connected by pedestrian access routes complying with R302 to boarding and alighting areas or boarding platforms complying with R308.1. Transit shelters shall provide a minimum clear space complying with R404 entirely within the shelter. Where seating is provided within transit shelters, the clear space shall be located either at one end of a seat or shall not overlap the area within 460 mm (1.5 ft) from the front edge of the seat. Environmental controls within transit shelters shall be proximity-actuated. Protruding objects within transit shelters shall comply with R402.

Advisory R308.2 Transit Shelters. The clear space must be located entirely within the transit shelter and not interfere with other persons using the seating.

R309 On-Street Parking Spaces

R309.1 General. On-street parking spaces shall comply with R309.

Advisory R309.1 General. R214 specifies how many accessible parking spaces must be provided on the block perimeter where on-

street parking is marked or metered.

Accessible parking spaces must be identified by signs displaying the International Symbol of Accessibility (see R211.3 and R411). Accessible parking spaces should be located where the street has the least crown and grade and close to key destinations.

R309.2 Parallel Parking Spaces. Parallel parking spaces shall comply with R309.2.

Advisory R309.2 Parallel Parking Spaces. The sidewalk adjacent to accessible parallel parking spaces should be free of signs, street furniture, and other obstructions to permit deployment of a van side-lift or ramp or the vehicle occupant to transfer to a wheelchair or scooter. Accessible parallel parking spaces located at the end of the block face are usable by vans that have rear lifts and cars that have scooter platforms.

R309.2.1 Wide Sidewalks. Where the width of the adjacent sidewalk or available right-of-way exceeds 4.3 m (14.0 ft), an access aisle 1.5 m (5.0 ft) wide minimum shall be provided at street level the full length of the parking space and shall connect to a pedestrian access route. The access aisle shall comply with R302.7 and shall not encroach on the vehicular travel lane.

Advisory R309.2.1 Wide Sidewalks. Vehicles may park at the curb or at the parking lane boundary and use the space required by R309.2.1 on either the driver or passenger side of the vehicle to serve as the access aisle.

R309.2.1.1 Alterations. In alterations where the street or sidewalk adjacent to the parking spaces is not altered, an access aisle shall not be required provided the parking spaces are located at the end of the block face.

R309.2.2 Narrow Sidewalks. An access aisle is not required where the width of the adjacent sidewalk or the available right-of-way is less than or equal to 4.3 m (14.0 ft). When an access aisle is not provided, the parking spaces shall be located at the end of the block face.

Advisory R309.2.2 Narrow Sidewalks. Vehicle lifts or ramps can be deployed on a 2.4 m (8.0 ft) sidewalk if there are no obstructions.

R309.3 Perpendicular or Angled Parking Spaces. Where perpendicular or angled parking is provided, an access aisle 2.4 m (8.0 ft) wide minimum shall be provided at street level the full length of the parking space and shall connect to a pedestrian access route. The access aisle shall comply with R302.7 and shall be marked so as to discourage parking in the access aisle. Two parking spaces are permitted to share a common access aisle.

Advisory R309.3 Perpendicular or Angled Parking Spaces. Perpendicular and angled parking spaces permit the deployment of a van side-lift or ramp.

R309.4 Curb Ramps or Blended Transitions. Curb ramps or blended transitions complying with R304 shall connect the access aisle to the pedestrian access route. Curb ramps shall not be located within the access aisle.

Advisory R309.4 Curb Ramps or Blended Transitions. At parallel parking spaces, curb ramps and blended transitions should be located so that a van side-lift or ramp can be

deployed to the sidewalk and the vehicle occupant can transfer to a wheelchair or scooter. Parking spaces at the end of the block face can be served by curb ramps or blended transitions at the pedestrian street crossing. Detectable warning surfaces are not required on curb ramps and blended transitions that connect the access aisle to the sidewalk, including where the sidewalk is at the same level as the parking spaces, unless the curb ramps and blended transitions also serve pedestrian street crossings (see R208).

R309.5 Parking Meters and Parking Pay Stations. Parking meters and parking pay stations that serve accessible parking spaces shall comply with R309.5. Operable parts shall comply with R403.

R309.5.1 Location. At accessible parallel parking spaces, parking meters shall be located at the head or foot of the parking space.

Advisory R309.5.1 Location. Locating parking meters at the head or foot of the parking space permits deployment of a van side-lift or ramp or the vehicle occupant to transfer to a wheelchair or scooter.

R309.5.2 Displays and Information. Displays and information shall be visible from a point located 1.0 m (3.3 ft) maximum above the center of the clear space in front of the parking meter or parking pay station.

R310 Passenger Loading Zones

R310.1 General. Passenger loading zones shall comply with R310.

Advisory R310.1 General. Accessible passenger loading zones must be identified by signs displaying the International Symbol of Accessibility (see R211.3 and R411).

R310.2 Vehicle Pull-Up Space. Passenger loading zones shall provide a vehicular pull-up space 2.4 m (8.0 ft) wide minimum and 6.1 m (20.0 ft) long minimum.

R310.3 Access Aisle. Passenger loading zones shall provide access aisles complying with R310.3 adjacent to the vehicle pull-up space. Access aisles shall be at the same level as the vehicle pull-up space they serve and shall not overlap the vehicular travel lane. Curb ramps or blended transitions complying with R304 shall connect the access aisle to the pedestrian access route. Curb ramps are not permitted within the access aisle.

R310.3.1 Width. Access aisles serving vehicle pull-up spaces shall be 1.5 m (5.0 ft) wide minimum.

R310.3.2 Length. Access aisles shall extend the full length of the vehicle pull-up spaces they serve.

R310.3.3 Marking. Access aisles shall be marked so as to discourage parking in them.

R310.3.4 Surfaces. Access aisle surfaces shall comply with R302.7.

CHAPTER R4: SUPPLEMENTARY TECHNICAL REQUIREMENTS

R401 General

R401.1 Scope. The supplemental technical requirements in Chapter 4 shall apply where required by Chapter 2 or where referenced by a requirement in this document.

R402 Protruding Objects

R402.1 General. Protruding objects shall comply with R402.

R402.2 Protrusion Limits. Objects with leading edges more than 685 mm (2.25 ft) and not more than 2 m (6.7 ft) above the finish surface shall protrude 100 mm (4 in) maximum horizontally into pedestrian circulation paths.

R402.3 Post-Mounted Objects. Where objects are mounted on free-standing posts or pylons and the objects are 685 mm (2.25 ft) minimum and 2030 mm (6.7 ft) maximum above the finish surface, the objects shall overhang pedestrian circulation paths 100 mm (4 in) maximum measured horizontally from the post or pylon base. The base dimension shall be 64 mm (2.5 in) thick minimum. Where objects are mounted between posts or pylons and the clear distance between the posts or pylons is greater than 305 mm (1.0 ft), the lowest edge of the object shall be 685 mm (2.25 ft) maximum or 2 m (6.7 ft) minimum above the finish surface.

R402.4 Reduced Vertical Clearance. Guardrails or other barriers to pedestrian travel shall be provided where the vertical clearance is less than 2 m (6.7 ft) high. The leading edge of the guardrail or barrier shall be located 685 mm (2.25 ft) maximum above the finish surface.

R403 Operable Parts

R403.1 General. Operable parts shall comply with R403.

Advisory R403.1 General. Operable parts on accessible pedestrian signals and pedestrian pushbuttons (see R209) and parking meters and parking pay stations that serve accessible parking spaces (see R309.6) must comply with R403.

R403.2 Clear Space. A clear space complying with R404 shall be provided at operable parts.

R403.3 Height. Operable parts shall be placed within one or more of the reach ranges specified in R405.

R403.4 Operation. Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 22 N (5 lbs) maximum.

R404 Clear Spaces

R404.1 General. Clear spaces shall comply with R404.

Advisory R404.1 General. Clear spaces are required at operable parts (see R403.2), including accessible pedestrian signals and pedestrian pushbuttons (see R209) and parking meters and parking pay stations that serve accessible parking spaces (see R309.6). Clear spaces are also required at benches (see R212.6) and within transit shelters (see R308.2).

R404.2 Surfaces. Surfaces of clear spaces shall comply with R302.7 and shall have a running slope consistent with the grade of the adjacent pedestrian access route and cross slope of 2 percent maximum.

R404.3 Size. Clear spaces shall be 760 mm (2.5 ft) minimum by 1220 mm (4.0 ft) minimum.

R404.4 Knee and Toe Clearance. Unless otherwise specified, clear spaces shall be permitted to include knee and toe clearance complying with R405.

R404.5 Position. Unless otherwise specified, clear spaces shall be positioned for

either forward or parallel approach to an element.

R404.6 Approach. One full unobstructed side of a clear space shall adjoin a pedestrian access route or adjoin another clear space.

R404.7 Maneuvering Space. Where a clear space is confined on all or part of three sides, additional maneuvering space shall be provided in accordance with R404.7.1 and R404.7.2.

R404.7.1 Forward Approach. The clear space and additional maneuvering space shall be 915 mm (3.0 ft) wide minimum where the depth exceeds 610 mm (2.0 ft).

R404.7.2 Parallel Approach. The clear space and additional maneuvering space shall be 1525 mm (5.0 ft) wide minimum where the depth exceeds 380 mm (1.25 ft).

R405 Knee and Toe Clearance

R405.1 General. Where space beneath an element is included as part of a clear space, the space shall comply with R405. Additional space shall not be prohibited beneath an element but shall not be considered as part of the clear space.

Advisory R405.1 General. Clearances are measured in relation to the usable clear space, not necessarily to the vertical support for an element. When determining clearance under an object, care should be taken to ensure that the space is clear of any obstructions.

R405.2 Toe Clearance

R405.2.1 General. Space under an element between the finish surface and 230 mm (9 in) above the finish surface shall be considered toe clearance and shall comply with R404.2.

R405.2.2 Maximum Depth. Toe clearance shall extend 635 mm (2.1 ft) maximum under an element.

R405.2.3 Minimum Required Depth. Where toe clearance is required at an element as part of a clear space, the toe clearance shall extend 430 mm (1.4 ft) minimum under the element.

R405.2.4 Width. Toe clearance shall be 760 mm (2.5 ft) wide minimum.

R405.3 Knee Clearance

R405.3.1 General. Space under an element between 230 mm (9 in) and 685 mm (2.25 ft) above the finish surface shall be considered knee clearance and shall comply with R405.3.

R405.3.2 Maximum Depth. Knee clearance shall extend 635 mm (2.1 ft) maximum under an element at 230 mm (9 in) above the finish surface.

R405.3.3 Minimum Required Depth. Where knee clearance is required under an element as part of a clear space, the knee clearance shall be 280 mm (11 in) deep minimum at 230 mm (9 in) above the finish surface, and 205 mm (8 in) deep minimum at 685 mm (2.25 ft) above the finish surface.

R405.3.4 Clearance Reduction. Between 230 mm (9 in) and 685 mm (2.25 ft) above the finish surface, the knee clearance shall be permitted to reduce at a rate of 25 mm (1 in) in depth for each 150 mm (6 in) in height.

R405.3.5 Width. Knee clearance shall be 760 mm (2.5 ft) wide minimum.

R406 Reach Ranges

R406.1 General. Reach ranges shall comply with R406.

R406.2 Unobstructed Forward Reach. Where a forward reach is unobstructed, the high forward reach shall be 1220 mm (4.0 ft) maximum and the low forward reach shall be 380 mm (1.25 ft) minimum above the finish surface. Forward reach over an obstruction is not permitted.

R406.3 Unobstructed Side Reach. Where a clear space allows a parallel approach to an element and the side reach is unobstructed, the high side reach shall be 1220 mm (4.0 ft) maximum and the low side reach shall be 380 mm (1.25 ft) minimum above the finish surface. An obstruction shall be permitted between the clear space and the element where the depth of the obstruction is 255 mm (10 in) maximum.

R407 Ramps

R407.1 General. Ramps shall comply with R407.

R407.2 Running Slope. Ramp runs shall have a running slope between 5 percent minimum and 8.3 percent maximum.

Advisory R407.2 Running Slope. Ramps with the least possible running slope accommodate the widest range of users. Providing stairways along with ramps, where possible, benefits pedestrians with heart disease, limited stamina, and others for whom distance presents a greater barrier than steps.

R407.3 Cross Slope. The cross slope of ramp runs shall be 2 percent maximum.

R407.4 Width. The clear width of a ramp run and, where handrails are provided, the clear width between handrails shall be 915 mm (3.0 ft) minimum.

R407.5 Rise. The rise for any ramp run shall be 760 mm (2.5 ft) maximum.

R407.6 Landings. Ramps shall have landings at the top and the bottom of each ramp run. Landings shall comply with R407.7.

R407.6.1 Slope. Landing slopes shall be 2 percent maximum in any direction.

R407.6.2 Width. The landing clear width shall be at least as wide as the widest ramp run leading to the landing.

R407.6.3 Length. The landing clear length shall be 1.5 m (5.0 ft) long minimum.

R407.6.4 Change in Direction. Ramps that change direction between runs at landings shall have a clear landing 1.5 m (5.0 ft) minimum by 1.5 m (5.0 ft) minimum.

R407.7 Surfaces. Surfaces of ramp runs and landings shall comply with R302.7.

R407.8 Handrails. Ramp runs with a rise greater than 150 mm (6 in) shall have handrails complying with R409.

R407.9 Edge Protection. Edge protection complying with R407.9.1 or R407.9.2 shall be provided on each side of ramp runs and ramp landings.

R407.9.1 Extended Ramp Surface. The surface of the ramp run or landing shall extend 305 mm (1.0 ft) minimum beyond the inside face of a handrail complying with R409.

Advisory R407.9.1 Extended Ramp Surface. The extended surface prevents wheelchair casters and crutch tips from slipping off the ramp surface.

R407.9.2 Curb or Barrier. A curb or barrier shall be provided that prevents the passage of a 100 mm (4 in) diameter sphere, where any portion of the sphere is within 100 mm (4 in) of the finish surface.

R408 Stairways

R408.1 General. Stairways shall comply with R408.

R408.2 Treads and Risers. All steps on a flight of stairs shall have uniform riser heights and uniform tread depths. Risers shall be 100 mm (4 in) high minimum and 180 mm (7 in) high maximum. Treads shall be 280 mm (11 in) deep minimum.

R408.3 Open Risers. Open risers are not permitted.

R408.4 Tread Surface. Stairway treads shall comply with R302.7. Changes in level are not permitted.

R408.5 Nosings. The radius of curvature at the leading edge of the tread shall be 13 mm (0.5 inch) maximum. Nosings that project beyond risers shall have the underside of the leading edge curved or beveled. Risers shall be permitted to slope under the tread at an angle of 30 degrees maximum from vertical. The permitted projection of the nosing shall extend 38 mm (1.5 in) maximum over the tread below.

R408.6 Handrails. Stairways shall have handrails complying with R409.

R409 Handrails

R409.1 General. Handrails required at ramps and stairways, and handrails provided on pedestrian circulation paths shall comply with R409.

Advisory R409.1 General. Handrails are required on ramp runs with a rise greater than 150 mm (6 in) (see R407.8) and stairways (see R408.6). Handrails are not required on pedestrian circulation paths. However, if handrails are provided on pedestrian circulation paths, the handrails must comply with R409 (see R216). The requirements in R409.2, R409.3, and R409.10 apply only to handrails at ramps and stairways, and do not apply to handrails provided on pedestrian circulation paths.

R409.2 Where Required. Handrails shall be provided on both sides of ramps and stairways.

R409.3 Continuity. Handrails shall be continuous within the full length of each ramp run or stair flight. Inside handrails on switchback or dogleg ramps and stairways shall be continuous between ramp runs or stair flights.

R409.4 Height. Top of gripping surfaces of handrails shall be 865 mm (2.8 ft) minimum and 965 mm (3.2 ft) maximum vertically above walking surfaces, ramp surfaces, and stair nosings. Handrails shall be at a consistent height above walking surfaces, ramp surfaces, and stair nosings.

R409.5 Clearance. Clearance between handrail gripping surfaces and adjacent surfaces shall be 38 mm (1.5 in) minimum.

R409.6 Gripping Surface. Handrail gripping surfaces shall be continuous along their length and shall not be obstructed along their tops or sides. The bottoms of handrail gripping surfaces shall not be obstructed for more than 20 percent of their length. Where provided, horizontal projections shall occur

38 mm (1.5 in) minimum below the bottom of the handrail gripping surface.

Advisory R409.6 Gripping Surface.

Pedestrians with disabilities and others benefit from continuous gripping surfaces that permit users to reach the fingers outward or downward to grasp the handrail.

R409.7 Cross Section. Handrail gripping surfaces shall have a cross section complying with R409.7.1 or R409.7.2. Where expansion joints are necessary for large spans of handrails, the expansion joint is permitted to be smaller than the specified cross section diameters for a 25mm (1 in) length.

R409.7.1 Circular Cross Section. Handrail gripping surfaces with a circular cross section shall have an outside diameter of 32 mm (1.25 in) minimum and 51 mm (2 in) maximum.

R409.7.2 Non-Circular Cross Sections. Handrail gripping surfaces with a non-circular cross section shall have a perimeter dimension of 100 mm (4 in) minimum and 160 mm (6.25 in) maximum, and a cross-section dimension of 57 mm (2.25 in) maximum.

R409.8 Surfaces. Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges.

R409.9 Fittings. Handrails shall not rotate within their fittings. Where expansion joints are necessary for large spans of handrails, the expansion joint is permitted to rotate in its fitting.

R409.10 Handrail Extensions. Handrail gripping surfaces shall extend beyond and in

the same direction of ramp runs and stair flights in accordance with R409.10. Extensions shall not be required for continuous handrails at the inside turn of switchback or dogleg ramps and stairways. In alterations where handrail extensions would reduce the clear width required for pedestrian access routes, handrail extensions shall not be required.

R409.10.1 Top and Bottom Extension at Ramps. Ramp handrails shall extend horizontally above the landing for 305 mm (1.0 ft) minimum beyond the top and bottom of ramp runs. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent ramp run.

R409.10.2 Top Extension at Stairways. At the top of a stair flight, handrails shall extend horizontally above the landing for 305 mm (1.0 ft) minimum beginning directly above the first riser nosing. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.

R409.10.3 Bottom Extension at Stairways. At the bottom of a stair flight, handrails shall extend at the slope of the stair flight for a horizontal distance at least equal to one tread depth beyond the last riser nosing. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.

R410 Visual Characters on Signs

R410.1 General. Visual characters on signs shall comply with R410.

R410.2 Finish and Contrast. Characters and their background shall have a non-glare finish. Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background.

Advisory R410.2.1 Finish and Contrast. Signs are more legible for pedestrians with low vision when characters contrast as much as possible with their background. Additional factors affecting the ease with which the text can be distinguished from its background include shadows cast by lighting sources, surface glare, and the uniformity of the text and its background colors and textures.

R410.3 Case. Characters shall be uppercase or lowercase or a combination of both.

R410.4 Style. Characters shall be conventional in form. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms.

R410.5 Character Proportions. Characters shall be selected from fonts where the width of the uppercase letter "O" is 55 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

R410.6 Character Height. Minimum character height shall comply with Table R410.2.5. Viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign. Character height shall be based on the uppercase letter "T".

R410.6 VISUAL CHARACTER HEIGHT

Height to finish surface from baseline of character	Horizontal viewing distance	Minimum character height
1.0 m (3.3 ft) to less than or equal to 1.8 m (5.8 ft)	Less than 1.8 m (6.0 ft)	16 mm (0.625 in).
	1.8 m (6.0 ft) and greater	16 mm (0.625 in), plus 3.2 mm (0.125 in) per 0.3 m (1.0 ft) of viewing distance above 1.8 m (6.0 ft).
Greater than 1.8 m (5.8 ft) to less than or equal to 3.0 m (10.0 ft).	Less than 4.6 m (15.0 ft)	51 mm (2 in).
	4.6 m (15.0 ft) and greater	51 mm (2 in), plus 3.2 mm (0.125 in) per 0.3 m (1.0 ft) of viewing distance above 4.6 m (15.0 ft).
Greater than 3.0 m (10.0 ft)	Less than 6.4 m (21.0 ft)	75 mm (3 in).
	6.4 m (21.0 ft) and greater	75 mm (3 in), plus 3.2 mm (0.125 in) per 0.3 m (1.0 ft) of viewing distance above 6.4 m (21.0 ft).

R410.7 Height from Finish Surface. Visual characters shall be 1.0 m (3.25 ft) minimum above the finish surface.

R410.8 Stroke Thickness. Stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 30 percent maximum of the height of the character.

R410.9 Character Spacing. Character spacing shall be measured between the two closest points of adjacent characters, excluding word spaces. Spacing between individual characters shall be 10 percent minimum and 35 percent maximum of character height.

R410.10 Line Spacing. Spacing between the baselines of separate lines of characters

within a message shall be 135 percent minimum and 170 percent maximum of the character height.

R411 International Symbol of Accessibility. The International Symbol of Accessibility shall comply with Figure R411. The symbol and its background shall have a non-glare finish. The symbol shall contrast with its background with either a light symbol on a dark background or a dark symbol on a light background.

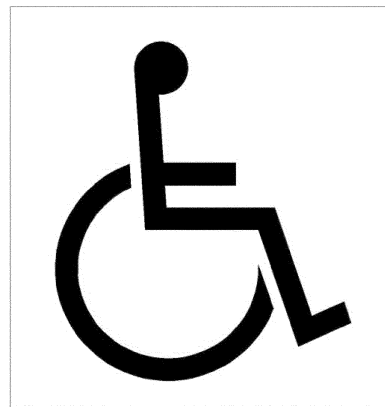


Figure R411

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