



**Presentation Details:**

**Slides:** 89

<p><b>Slide 1</b>  <b>Slide 1</b>                  Duration: 00:00:14                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Landing Slide</p>
<p><b>Slide 2</b>  <b>The Integration Mandate</b>                  Duration: 00:00:16                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Commonly known as the “integration mandate,” public entities must make their programs, services, and activities accessible to qualified people with disabilities in the most integrated way appropriate to their needs. The “most integrated setting” is a setting which “enables individuals with disabilities to interact with non-disabled persons to the fullest extent possible.</p>
<p><b>Slide 3</b>  <b>The Integration Mandate Continued...</b>                  Duration: 00:00:19                  Advance mode: Auto</p>	<p><b>Notes:</b>                  The settings that may be appropriate for an individual range from institutional settings to non-institutional residential settings such as assisted living, or home and community-based settings. Title II of the ADA does not require measures that would “fundamentally alter” the nature of a public entity’s programs. “Fundamental alteration” is the concept under the ADA which governs the extent to which a public entity must modify its program to meet its obligations under the Act. Costs may bear on that determination.</p>
<p><b>Slide 4</b>  <b>Separate (Special) Activities</b>                  Duration: 00:00:29                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Separate or special activities are permitted under Title II to ensure that people with disabilities receive an equal opportunity to benefit from the government’s programs, services, or activities. However, even if a separate program is offered to people with disabilities or people with one kind of disability, a public entity cannot deny a person with a disability access to the regular program. Under the ADA, people with disabilities decide which program they want to participate in, even if the public entity does not think the individual will benefit from the regular program.</p>
<p><b>Slide 5</b>  <b>Two Requirements of Title II</b>                  Duration: 00:00:16                  Advance mode: Auto</p>	<p><b>Notes:</b>                  There are two requirements with which contractors, builders, employees and other interested parties should become familiar as it pertains to Title II of the ADA. There are both Program and Administrative requirements and Physical Accessibility requirements and standards. We will first begin by reviewing Program and Administrative requirements before moving on to the actual Physical Accessibility standards and requirements.</p>
<p><b>Slide 6</b>  <b>Programs, Services, and Activities Defined...</b>                  Duration: 00:00:21                  Advance mode: Auto</p>	<p><b>Notes:</b>                  A Program is set of activities with a specific goal or a system of procedures or activities that has a specific purpose[1], whereas Services can be defined as a body of people who carry out work for the public benefit within an organization run by local or national government[2]. And, Activities can be defined as something that somebody takes part in or does[3]. In any instance, be it a Program, Service or Activity, each of these should be made readily available to both able-bodied and disabled persons, per the ADA.</p>

	<p><b>SOURCE:</b>  <a href="http://encarta.msn.com/dictionary_/Program.html">http://encarta.msn.com/dictionary_/Program.html</a>  <a href="http://encarta.msn.com/dictionary_/Services.html">http://encarta.msn.com/dictionary_/Services.html</a>  <a href="http://encarta.msn.com/dictionary_/Activities.html">http://encarta.msn.com/dictionary_/Activities.html</a></p>
<p><b>Slide 7 Examples</b>  Duration: 00:00:35  Advance mode: Auto</p>	<p><b>Notes:</b>  There are several Programs, Services, and Activities provided by public entities around the country each year.</p> <p>Some examples of Programs include: Town Meetings and Recreational Programs. Some examples of Services include Emergency Services (such as Police, Fire, 911), Corrections, Courts, Diplomacy, Tax Assessment and Collection, and Motor Vehicle Licensing. Some examples of Activities include Parks and Recreation, Polling Stations, Stadiums, and Sidewalks.</p>
<p><b>Slide 8 Additional Examples: FHWA Federal-aid Recipients</b>  Duration: 00:00:32  Advance mode: Auto</p>	<p><b>Notes:</b>  Public entities and FHWA Federal-aid recipients such as State Departments of Transportation (or STAs) provide programs and services such as public involvement activities such as public meetings, hearings or information sessions on highway projects and transportation programs. STAs may also conduct right-of-way negotiation and condemnation activities, Adopt-a-Highway programs, and establish tourist information centers at Interstate rest areas using Federal aid. Metropolitan Planning Organizations (or MPOs) perform public involvement activities for planning programs they develop.</p> <p>The aforementioned are just some examples (and by no means a complete list) of the types of programs, services, and activities typically offered by state and local governments.</p>
<p><b>Slide 9 What Does The Law Say About Inaccessibility?</b>  Duration: 00:00:50  Advance mode: Auto</p>	<p><b>Notes:</b>  By law, no qualified individual with a disability shall, because of a public entity's facility inaccessibility, be excluded from participation in, or be denied the benefits and services of programs, or activities of a public entity, or be subject to discrimination by a public entity.</p> <p>Should there be an activity, service, or program that, when viewed in its entirety, is inaccessible to any person, disabled or temporarily-abled, then it is the responsibility of the public entity to make such programs, services, and activities available as soon as possible. The entity should note the area or areas of inaccessibility and plan to take corrective action. We will discuss how to rectify such areas of noncompliance in the Self-Evaluation and Transition Plan portions of this presentation. <i>SOURCE: Department of Justice Office of the Attorney General 28 CFR pt 35 Subpart D §35.149 (10/5/05)</i></p>
<p><b>Slide 10 Expectations of State and Local Governments</b>  Duration: 00:00:17  Advance mode: Auto</p>	<p><b>Notes:</b>  State and local governments must ensure that individuals with disabilities are not excluded from services, programs, and activities because buildings are inaccessible. However they need not remove physical barriers, such as stairs, in all existing buildings, as long as they make their programs accessible to individuals who are unable to use an inaccessible existing facility.</p>

<p><b>Slide 11</b>  <b>Expectations of State and Local Governments Continued...</b>          Duration: 00:00:25          Advance mode: Auto</p>	<p><b>Notes:</b>          State and local governments can provide the services, programs, and activities offered in the facility to individuals with disabilities through alternative methods, such as:</p> <ul style="list-style-type: none"> <li>• Relocating a service to an accessible facility, such as moving a public information office from the third floor to the first floor of a building.</li> <li>• Providing an aide or personal assistant to enable an individual with a disability to obtain the service.</li> <li>• Providing benefits or services at an individual's home, or at an alternative accessible site.</li> </ul>
<p><b>Slide 12</b>  <b>Expectations of State and Local Governments Continued...</b>          Duration: 00:00:14          Advance mode: Auto</p>	<p><b>Notes:</b>          State and local government entities may not carry an individual with a disability as a method of providing program access, except in manifestly exceptional circumstances. They are also not required to take any action that would result in a fundamental alteration in the nature of the service, program, or activity or be subjected to an undue financial and/or administrative burden. However, public entities must take any other action that would ensure that individuals with disabilities receive the benefits or services.</p>
<p><b>Slide 13</b>  <b>Next...</b>          Duration: 00:00:30          Advance mode: Auto</p>	<p><b>Notes:</b>          As mentioned earlier, there are both Program and Administrative requirements and Physical Accessibility requirements and standards required under the ADA. Being that we have reviewed, to this point, the Program and Administrative requirements, we will now focus on the physical Accessibility standards and requirements established by the ADA. However, before we progress any further, it is important to understand the importance of accessibility...</p>
<p><b>Slide 14</b>  <b>Current Transportation Infrastructure Assumes...</b>          Duration: 00:00:49          Advance mode: Auto</p>	<p><b>Notes:</b>          ...Therefore, take a moment and think about current modes of transportation available in the United States. Visualize your local bus and/or train transit systems. Think about the sidewalks in and around your local neighborhoods. Also, consider interstates, crossings, signs, and signals. What conclusions could you draw from the structure and current operational function of these elements as it pertains to the "temporarily-abled" versus the disabled?           It would be safe to say that the current transportation system, in some instances, assumes that users: (1) are able-bodied; (2) have good vision and hearing; and (3) can understand traffic control devices. However, the truth of the matter is many users of the transportation system in the US do not fit the aforementioned assumptions.</p>

<p><b>Slide 15</b>  <b>Consider the Following...</b>          Duration: 00:00:15          Advance mode: Auto</p>	<p><b>Notes:</b>          Consider this: approximately 20% of the U.S. population older than age 15 has a disability, according to the 2000 Census. Additionally, eventually, 70% of the general population in the U.S. will have a temporary or permanent disability that makes climbing stairs impossible according to the National Council on Disabilities.</p>
<p><b>Slide 16</b>  <b>When/How Do People Become Disabled?</b>          Duration: 00:00:12          Advance mode: Auto</p>	<p><b>Notes:</b>          It is important to note that disabilities may occur either at birth, suddenly (due to accidents or disease), or slowly over time. Additionally, disabilities may be either permanent or temporary.</p> <p>Bearing this in mind, it is important to understand that the protections and guidelines set forth by the ADA, enforceable by the D.O.J. and D.O.T. in conjunction with other federal agencies, can have a direct impact on one's daily life. Such an impact is inevitable, whether it affects one's use of a curb ramp or a street crossing with an accessible pedestrian signal. This is all the more reason it is important that you are not only aware as an individual, but that the public entity for which you work, or from which you receive services, is compliant with ADA standards and guidelines.</p>
<p><b>Slide 17</b>  <b>Buildings</b>          Duration: 00:00:28          Advance mode: Auto</p>	<p><b>Notes:</b>          The ADA does not require retrofitting of existing buildings to eliminate barriers, but does establish a high standard of accessibility for new buildings.</p> <p>Public entities must ensure that newly constructed buildings and facilities are free of architectural and communication barriers that restrict access or are used by individuals with disabilities. When a public entity undertakes alterations to an existing building, it must also ensure that the altered portions are accessible.</p>
<p><b>Slide 18</b>  <b>Accessibility Standards</b>          Duration: 00:00:19          Advance mode: Auto</p>	<p><b>Notes:</b>          Public entities may choose between two technical standards for accessible design: The Uniform Federal Accessibility Standard, established under the Architectural Barriers Act, or the Americans with Disability Act Accessibility Guidelines, adopted by the Department of Justice for places of public accommodation and commercial facilities covered by Title III of the ADA.</p>

<p><b>Slide 19</b>  <b>Undue Burden</b>          Duration: 00:00:40          Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Small providers of services and activities (a recipient of fewer than 15 employees) are not required to make significant structural alterations to their existing facilities for the purpose of assuring program accessibility if alternative means of providing the services are available.</p> <p>Additionally, the ADA specifies in the event that it is determined by an enforcing authority that structural alterations create an undue burden on and STA or MPO, then it will not be required that changes or alterations be made. Such a determination, which could include potentially incurring significant costs when compared to the entity's entire budget, must be made in writing and approved by the head of the agency or his or her designee, if that designee has budgetary and administrative decision-making authority.</p>
<p><b>Slide 20</b>  <b>Technical Infeasibility</b>          Duration: 00:00:46          Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>When recipients and public entities construct new facilities, it is generally expected that the new facilities fully comply with ADAAG or UFAS. However, in new construction, a person or entity is not required to fully meet the requirements of these guidelines where that person or entity can demonstrate that it is structurally impracticable (or technically infeasible) to do so.</p> <p>Full compliance will be considered structurally impracticable only in those rare circumstances when the unique characteristics of terrain prevent the incorporation of accessibility features. If full compliance with the requirements of these guidelines is structurally impracticable, a person or entity shall comply with the requirements to the extent it is not structurally impracticable. Any portion of the building or facility which can be made accessible shall comply.</p>
<p><b>Slide 21</b>  <b>Technical Infeasibility Continued...</b>          Duration: 00:00:47          Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>When recipients and public entities undergo alterations of existing facilities, building and site constraints that are encountered during the course of the project may preclude full compliance with ADAAG or UFAS. In these instances, the recipient or public entity should analyze the site and project scope to determine whether it is "technically infeasible" to achieve full compliance with these standards.</p> <p>Technical Infeasibility means, with respect to an alteration of an existing building or a facility, that there is little likelihood of accomplishing change. This could be due to existing structural conditions that would require removing or altering a load-bearing member of the structure which is an essential part of the structural frame. It could also be due to other existing physical or site constraints that prohibit modification or addition of elements, spaces, or features which are in full and strict compliance with the minimum requirements for new construction and which are necessary to provide accessibility.</p>

<p><b>Slide 22</b>  <b>Technical Infeasibility Continued...</b>                  Duration: 00:00:18                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Exceptions, do however, exist. As mentioned before, in alteration work, if compliance with the ADA is technically infeasible, the alteration shall provide accessibility to the maximum extent feasible. Any elements or features of the building or facility that are being altered and can be made accessible shall be made accessible within the scope of the alteration.</p>
<p><b>Slide 23</b>  <b>Technical Infeasibility Continued...</b>                  Duration: 00:00:34                  Advance mode: Auto</p>	<p><b>Notes:</b>                  One such example of a facility that might be technically infeasible to update or modify includes that of a naturally formed underground cavern dug out and made accessible to the general public for viewing and touring. If it is seen that the level of difficulty in making physical accommodations is beyond technical possibility, and the safety of tourists could be compromised, it would not be required that changes or alterations be made.                   Another example would be a situation where a building owner wants to install an accessible ramp into a building, but their sidewalk is too short to accommodate both the clear width of the ramp and sidewalk (and the building owner cannot remove portions of the building to achieve clear width. In this instance, the building owner would construct the ramp as wide as technically feasible and document the process and/or decision to do so.</p>
<p><b>Slide 24</b>  <b>Program Accessibility Review One</b>                  Duration: 00:00:10                  Advance mode: By user</p>	<p><b>Notes:</b> N/A</p>
<p><b>Slide 25</b>  <b>Pedestrian/PROW Accessibility</b>                  Duration: 00:00:20                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Because there are a range of pedestrian disabilities amongst various individuals throughout the United States, there are a number of ways that people with disabilities use pedestrian facilities. Likewise, there are numerous pedestrian facility designs that might negatively affect and/or restrict the mobility and safety of such pedestrians in the instance the designs are non-compliant with ADA standards.</p>

<p><b>Slide 26</b>  <b>Introduction to Pedestrian Accessibility</b>          Duration: 00:00:34          Advance mode: Auto</p>	<p><b>Notes:</b>          As such, the following topics will provide a working knowledge and understanding of U.S. DOT and FHWA accessibility guidelines and requirements. Not only will you learn the characteristics of pedestrians and the pedestrian environment, you will also gain intelligence regarding how to enhance pedestrian mobility, independence and safety via accessible pedestrian designs. We will review the availability of design resources, while we discuss obligations to evaluate practices, policies and activities for discrimination and remove barriers to achieve program success.</p>
<p><b>Slide 27</b>  <b>Characteristics of Pedestrians and the Pedestrian Environment</b>          Duration: 00:00:24          Advance mode: Auto</p>	<p><b>Notes:</b>          As previously mentioned, the Americans with Disabilities Act Accessibility Guideline provides a foundation for best practices. Best practices should be considered, in all cases, for safer, more user-friendly facilities in the public right-of-way. Because the pedestrian environment is more hazardous than the building environment, it is especially important that engineers, designers, consultants, planners, and such be familiar with the ADAAG.</p>
<p><b>Slide 28</b>  <b>Pedestrians</b>          Duration: 00:00:09          Advance mode: Auto</p>	<p><b>Notes:</b>          Not only do they interact regularly with motorists, pedestrians tend to travel faster in the outdoors environment. As a result, there are many opportunities for conflicts even as a non-disabled pedestrian. Taking these factors and many more into consideration (including hazardous weather conditions, physical and visual barriers), traveling safely as a disabled individual can become increasingly more difficult when accessibility standards are not properly followed.</p>
<p><b>Slide 29</b>  <b>Assistive Technologies and Devices</b>          Duration: 00:00:25          Advance mode: Auto</p>	<p><b>Notes:</b>          People with disabilities often require Assistive Technologies or Assistive Devices. These can include manual wheelchairs, powered wheelchairs, powered scooters, walkers, crutches, canes, and prostheses. Other Assistive Technologies and Assistive Devices include dog guides, service animals, handheld telescopes, binoculars, magnifiers, and hearing aids.           It is important to note that devices and technologies don't completely solve problems posed by an inaccessible environment. Therefore, designers must understand that there are various types of pedestrians they must consider...just as there are various types of vehicles that use the roads.</p>

<p><b>Slide 30</b>  <b>The Pedestrian Environment</b>          Duration: 00:00:22          Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Before moving forward, let's take a look at the elements you would typically find in a Pedestrian Environment. Consider sidewalks, trails, crosswalks, paved shoulders, and curb ramps, just to name a few. If poorly designed and/or constructed, such elements could cause movement obstacles or barriers to their users.</p> <p>For instance, obstacles placed on sidewalks could prevent forward movement for individuals using wheelchairs. Other information barriers such as obstacles not being detectable by canes, unlit or dimly lit travel paths, signs and signals only in visual format, and undefined boundaries between sidewalks and streets could also pose a problem for disabled pedestrians. Moreover, complex intersections contribute to unusual vehicle turning movements and can cause issues for those who are attempting to cross these intersections.</p>
<p><b>Slide 31</b>  <b>Pedestrian Routes</b>          Duration: 00:00:14          Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>The pedestrian environment is expected to be designed and built to suit a broad variety of users, in which case users should be able to travel independently, without assistance. Therefore, pedestrian facilities planning and design is expected to be apart of the overall design process...not an afterthought.</p>
<p><b>Slide 32</b>  <b>Pedestrian Routes Continued...</b>          Duration: 00:00:38          Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>There are several paths of travel used by pedestrians including Paths, Shoulders, and Sidewalks. Paths are often created for outdoor recreation activities such as walking, skating, biking, or skateboarding. Whereas, paved shoulders can usually be found on rural highways and suburban roadways. In a number of states, a highway shoulder is a pedestrian route when pedestrian travel is not prohibited by law. Additionally, in a number of states, paved shoulders are specifically permitted where sidewalks are not available. Sidewalks can be found in most any community across the country.</p>
<p><b>Slide 33</b>  <b>Best Practices for Pedestrian Route Planning and Design</b>          Duration: 00:00:39          Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Designers and pedestrians, alike, should be aware of these travel path types for the purposes of ensuring the best structure and design of such routes to avoid accidents and complicated travel for the millions of users these pathways serve each day.</p> <p>What is the best way to design and plan for pedestrian routes? Well, we must first understand the elements that compose a pedestrian corridor, or Public Right of Way. Additionally, we will review the standards set forth by ADAAG regarding these PROW elements. After we gain a clear understanding of PROW, we will explore Designing Pedestrian Facilities For Accessibility.</p>

**Slide 34**  
**Public Right of Way**

Duration: 00:04:49  
 Advance mode: Auto

**Notes:**

**INTRODUCTION:** Public right-of-way (or PROW) is the land or property, usually in a corridor, that is acquired for or devoted to transportation purposes. In many jurisdictions, the right-of-way is divided into four zones: the frontage zone, the pedestrian zone, the furnishing zone, and the curb zone.

The Frontage Zone is the strip along the inside (non-vehicular) edge that abuts storefronts or residences. This zone is frequently the location for signage, building-related construction (such as ramps, walls, and entries) and other pedestrian amenities. The Pedestrian Zone includes the Pedestrian Access Route (or PAR). The Furnishings Zone is adjacent to the curb line and is the location most frequently used for bus stops, parking meters, utility connections, light poles, and similar appurtenances. The Curb Zone is literally the top of the curb.

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**PROW ZONE SYSTEM:** This Sidewalk Zone System makes it easier for designers to provide accessible sidewalks, as they consider all of the elements that could possibly affect uninhibited movement and travel for able-bodied and disabled users, alike. Take a look at the photo provided and review the illustration to be sure you understand the Sidewalk Zone System.

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**CURB ZONE:** Let's take a moment to review the Curb Zone in more detail. This is the area where designers incorporate adequate drainage for the roadways and sidewalks. The Curb Zone keeps drivers from parking on the sidewalk and acts as a valuable cue for the vision impaired. This is the zone where pedestrians transition to and from the roadways.

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**FURNISHINGS ZONE:** Now, as for the Furnishings (or Furniture) Zone, this is the area between the curb and the pedestrian zones that allow space for street furniture such as signs, benches, bus stop structures, trees, fire hydrants, potted plants, and more. This zone keeps the Pedestrian Zone free of obstacles and buffers pedestrians from the main roadway. The Furnishings Zone also makes it easier to provide accessible ramps and driveways for pedestrians.

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**FURNISHINGS ZONE MEASUREMENT CONSIDERATIONS:** Measurements for the Furnishings Zone varies, depending upon what will be housed in the area. The following measurement allowances should be considered:

- \*2' minimum for sign and pole placement
- \*4' minimum for tree placement
- \*6' minimum for snow storage
- \*8' minimum to provide perpendicular curb ramps

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**PEDESTRIAN ZONE:** Let's talk about the Pedestrian (or Sidewalk) Zone. This is the area located between the furnishings and frontage zones. This is the area most often traveled by pedestrians, which makes it the most important zone in the entire Sidewalk Zone System. The Pedestrian Zone includes the PAR. It must be free of obstacles and protruding objects at all times.

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**PEDESTRIAN ZONE WIDTH:** The width of the Pedestrian Zone varies based on pedestrian volume, however the ADAAG specifies there must be a 5'x 5' passing area placed every 200', allowing for a practical minimum width of a 5' Pedestrian Zone. Now, even though the entire Pedestrian Zone can vary in width, the PAR within the Pedestrian Zone must currently be a minimum of 3' in width.

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**PEDESTRIAN ZONE WIDTH SCENARIOS:** The width of the Pedestrian Zone can accommodate a variety of users and

	<p>situations. For example a 5' path allows two people to walk side-by-side or pass one another, whereas a 6' path allows for two people to more comfortably walk beside or pass one another in the Pedestrian Zone. A 3' path allows for one wheelchair user at a time to access the PAR, where 3.5' path allows travel for a person using crutches. A 4' path takes into consideration a user with a dog guide or a sighted guide, while a 5' path allows for turning a wheelchair. A 5' path is also good for allowing one wheelchair user and walking companion to share the Pedestrian Zone while traveling together, where a 6' path allows two wheelchair users to access the PAR simultaneously (whether side-by-side, or in passing). A full curbside sidewalk (least desirable) would be 6', minimally...allowing 2' for poles/signs and 4' for pedestrians.</p> <p>-----</p> <p>FRONTAGE ZONE: Last, but not least, lies the Frontage Zone. This is the area located closest inside of the Sidewalk Zone System. The Frontage Zone allows room for doors on buildings to open and close. It also allows for the installation or placement of planter boxes and signs on buildings. This area must be free of overhanging and protruding obstacles.</p>
<p><b>Slide 35</b>  <b>Designing Pedestrian Facilities for Accessibility</b>          Duration: 00:00:22          Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>We have just finished reviewing Public Rights-of-Way...what they are, how they are divided through the concept of the Zone System, and the minimum required measurements established by the ADAAG in designing pedestrian routes that work for everyone. In the next few slides, we will focus on the importance of Designing Pedestrian Facilities for Accessibility (or DPFA).</p>
<p><b>Slide 36</b>  <b>Reasons for DPFA Non-Compliance</b>          Duration: 00:00:42          Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Unfortunately, the reality remains that there are many Sidewalk Zone Systems across the US that remain at minimal or out of complete compliance with the aforementioned guidelines.</p> <p>Some of the noncompliance or minimal compliance can be attributed to several factors including:</p> <ul style="list-style-type: none"> <li>• Lack of Education regarding PROWs and ADAAG or UFAS Standards</li> <li>• Unawareness of Adverse Effects caused by Noncompliance</li> <li>• Insensitivity to the Needs of the Disabled Pedestrian Population</li> <li>• Inadequate Funding to Design Proper Pedestrian Corridors</li> <li>• Making vehicular traffic design and construction of highways with pedestrian facilities as the overriding priority</li> <li>• Ongoing development of accessibility standards leads to uncertainty and confusion with respect to compliance activity</li> </ul>
<p><b>Slide 37</b>  <b>How is DPFA Important?</b>          Duration: 00:00:13          Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Either way, it is fundamentally important that designers not only be aware of the design standards associated with PROWs, but that they also incorporate established guidelines and standards in modification and new construction projects. It is only in this way that essential change can begin to establish itself such that PROWs across the country become compliant and easily traveled by able-bodied and disabled pedestrians.</p>

<p><b>Slide 38</b>  <b>Public Rights-of-Way Access Advisory Committee</b>          Duration: 00:00:26          Advance mode: Auto</p>	<p><b>Notes:</b>          To assist designers and to allow all interested parties (like you and I) the opportunity to know how a proper or model PROW should be designed, the US Access Board has established a Public Rights-of-Way Access Advisory Committee, known as PROWAAC. This committee conducts research on PROWAG and pedestrian accessibility. In conjunction with other entities, this Advisory Committee has assisted in the establishment of Public Rights-of-Way Accessibility Guidelines (more commonly referred to as PROWAG), which are currently in draft form and are not an enforceable standard. However, the FHWA has endorsed the Draft PROWAG as a best practice that can be used where ADAAG does not fully address a design or construction situation.</p>
<p><b>Slide 39</b>  <b>Next...</b>          Duration: 00:00:19          Advance mode: Auto</p>	<p><b>Notes:</b>          We have just reviewed the zones of a PROW And, one of the last zones we discussed was the Pedestrian Zone which consists of the Pedestrian Access Route (also referred to as the PAR or Sidewalk). Following, we will review details on exactly what Sidewalk Design specifications should be considered when building or modifying a Pedestrian corridor.</p>
<p><b>Slide 40</b>  <b>Sidewalk Designs</b>          Duration: 00:00:38          Advance mode: Auto</p>	<p><b>Notes:</b>          Sidewalks are probably one of the most readily recognizable paths of travel used by pedestrians on a daily basis. So, before we get into the details regarding sidewalk design, let's take a moment to review the definition of a sidewalk, as defined by the PROWAC's Special Report: Accessible Public Rights-of-Way publication released in July of 2007.</p> <p>A sidewalk is that portion of a PROW between the curb line (or lateral line of a roadway) and the adjacent property line that is improved for use by pedestrians. Total sidewalk width is the surfaced (or paved) area measured from the back of the curb to the right-of-way line.</p> <p>Given the importance of their location in each community across the US, it is critical that sidewalks be designed to accommodate both the able-bodied and the disabled, with ease. As such, following we will review some design guidelines established by the ADAAG as it pertains to sidewalk construction.</p>
<p><b>Slide 41</b>  <b>Sidewalk Designs Continued...</b>          Duration: 00:00:44          Advance mode: Auto</p>	<p><b>Notes:</b>          ADAAG states that all accessible routes (including sidewalks) should meet the following design specifications:</p> <ul style="list-style-type: none"> <li>• <b>WIDTH:</b> Sidewalks should have a 36" (or 3') minimum width, except at a pinch point (where 32", 24" would be acceptable)</li> <li>• <b>PASSING SPACE:</b> If the accessible route is less than 60 inches (or 5'), there shall be a 60 x 60 inch (or 5' x 5') passing space at a maximum of 200' intervals.</li> <li>• <b>RUNNING SLOPE:</b> Because sidewalks adjacent to exiting roadways cannot exceed a roadway grade, it is suggested that a 1:20 (or 5%) maximum is allowed for running slopes. If a running slope is greater than 5%, it must be treated as a ramp.</li> </ul>

<p><b>Slide 42</b>  <b>Sidewalk Designs</b>  <b>Continued...</b>                  Duration: 00:01:30                  Advance mode: Auto</p>	<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• <b>RAMPS:</b> Running slopes greater than 5% must be treated as ramps. Therefore a 1 to 12 (or 8.3%) maximum is allowed for a maximum rise of 2.5', with 5' x 5' level landings between segments. For instance, at an 8.3% grade, a 2.5' rise would be 30' long. So, every 30' on a ramp should be met by a 5' x 5' landing to allow space for a wheelchair to turn, rest, or stop. The slope cannot be continuous without landings. The Draft PROWAG allows the running slope of a sidewalk adjacent to a roadway, within the right-of-way lines to match, but not exceed the running grade of the roadway.</li> <li>• <b>CROSS SLOPE:</b> Cross-slope is the right-left or perpendicular pitch or grade of a pedestrian route. A 0% cross slope is best for wheelchair users. However a 2% maximum is allowed, as there is some slope necessary for rainwater drainage. A "level" cross slope mean of 2% maximum slope is allowed.</li> <li>• <b>CHANGES IN LEVEL:</b> If the change in level is greater than ½", then a curb ramp, ramp, etc. must be provided, as the requirements state that the standard allowance for elevation difference between adjacent surfaces is less than ¼". Up to ¼" may remain vertical. However, between ¼" and ½" is allowed, if beveled at a 1 to 2 maximum slope (such as in cases with utility covers, vaults, plates, or sections of sidewalk).</li> </ul>
<p><b>Slide 43</b>  <b>Accessible</b>  <b>Driveways</b>                  Duration: 00:00:36                  Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Consider when a user approaches a driveway crossing when using a sidewalk. The user is likely to experience a rapid change of grade at the driveway flare, which results in a steep cross slope greater than the maximum-allowed 2% across the PAR. On a steep cross slope, a wheelchair user may experience a compromise in the balance and stability of his/her vehicle, possibly even causing some wheels to come off of the ground at some point. To avoid such possible dangerous situations, an engineer may want to consider accessible driveway design similar to that illustrated here.</p>
<p><b>Slide 44</b>  <b>Accessible</b>  <b>Driveways</b>  <b>Continued...</b>                  Duration: 00:00:25                  Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>When designing for an accessible driveway crossing consider the following factors:  <b>CROSS SLOPE:</b> There is a 2% maximum cross slope allowed for driveway crossings.  <b>WIDTH:</b> The suggested width for crossings is 4'. However, 3' is currently the minimum requirement under ADAAG and UFAS.  <b>OTHER FACTORS:</b> Planter strip width, curb height, available right-of-way, landscaping, signs, utility poles and other potential obstructions should be accounted for.</p>
<p><b>Slide 45</b>  <b>Jogged and</b>  <b>Parallel</b>  <b>Driveway</b>  <b>Crossings</b>                  Duration: 00:00:46                  Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Jogged driveway crossings and parallel driveway crossings should encompass "satisfactory retrofit" designs. In each case, individuals with visual disabilities are less likely to experience difficulty following the travel path if the minimum width of a jogged driveway is at least 3' (at best, 4' or wider). Additionally, designers should consider the following possible problems at parallel driveway crossings:</p> <ul style="list-style-type: none"> <li>• Drainage issues</li> <li>• Users might be forced to negotiate two ramps if there are ramped sidewalks leading to the driveway apron</li> <li>• Motorists may enter the crossing at higher rates of speed, at a commercial driveway</li> <li>• People with visual disabilities walking on the driveway may accidentally veer into the street</li> </ul>

<p><b>Slide 46</b>  <b>Program Accessibility Review Two</b>          Duration: 00:00:10          Advance mode: By user</p>	<p><b>Notes:</b> N/A</p>
<p><b>Slide 47</b>  <b>Surface Finishings</b>          Duration: 00:01:51          Advance mode: Auto</p>	<p><b>Notes:</b>          GENERAL CONSIDERATIONS: When designing sidewalks for pedestrians, designers should consider surfacing finishes or surfacing solutions that allow for the best travel possible. The ADAAG requirement is that surfaces be firm, stable, slip-resistant, smooth, and free of rough textures, large openings, and gaps.          -----          IDEAL FINISHING SUBSTANCES: Generally, concrete and/or colored asphalt are ideal substances to use when finishing sidewalk surfaces, as they are smooth, easy to make flat, and offer the least resistance. Also, with concrete, a broom finish adds traction. However, concrete with large, exposed aggregate composite is not ideal in that it creates a texture that is too rough and can prove highly uncomfortable and/or difficult for wheelchair-users to navigate.          -----          TEXTURED SURFACES: Textured surfaces such as well-installed, well-maintained bricks, paving stones, and flagstones may work in the instance that grout lines are narrow or flush. However, textured surfaces such as loose and/or unmaintained bricks, cobblestones, pillowed pavers, and textured or special design pavement can cause increased rolling resistance, tripping hazards, and painful vibrations for people with brittle bones or spinal chord injuries in wheelchairs. Additionally, textured surfaces can prove difficult to maintain as it is continually exposed to “the elements” (such as snow, rain, sleet, continuous weight, or earth shifting) over time.          -----          COMBINATION FINISHES: Designers may choose to use a combination of sidewalk finishes, suitable for all pedestrians. For instance, textured surfaces in the frontage zones and furnishing zones, in combination with smooth surfaces in the pedestrian zone would work. Color contrast between the pedestrian zone and other zones may also make the PAR more easily traveled by all users.</p>
<p><b>Slide 48</b>  <b>Openings, Gaps, and Grates</b>          Duration: 00:00:30          Advance mode: Auto</p>	<p><b>Notes:</b>          Imagine you leave your desk at this very moment, and you decide you want to take a walk outside in your neighborhood. Not that you haven’t seen it before, but you may look down and now notice that there are joints or cracks in the sidewalk that are not only visible, but seemingly require immediate attention or maintenance. Also continue to imagine you are walking and you are all of a sudden standing atop a sewage drain with opening slits, or your are standing atop a grated metal opening in the sidewalk.</p>

<p><b>Slide 49</b>  <b>Openings, Gaps, and Grates</b>  <b>Continued...</b>                  Duration: 00:00:32                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Such elements could pose traveling difficulties for those traveling in wheelchairs or using walkers or canes. Therefore, designers should consider posing solutions that eliminate or minimize joints, cracks, holes, grates, and gaps. ADAAG proposes that openings in the sidewalk be no greater than ½” wide. Additionally, grate openings shall be perpendicular to the direction of travel, so that the wheels of wheelchair travelers are not readily caught in the grates. Wire mesh screens and welded straps can be added to existing grates to increase the ease with which travelers move.</p>
<p><b>Slide 50</b>  <b>Crossings and Intersections</b>                  Duration: 00:00:29                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Two of the most intricate elements pedestrians must encounter each day while traveling the roads include Crossings and Intersections. Shortly, we will discuss the different types of crossings and intersections for which designers must plan, as pedestrian safety plays an integral part in how such elements are built. Keeping in mind that pedestrians tend to cross roads where it is most convenient, these pedestrians need to be able to determine when and where they can safely cross any roadway.</p>
<p><b>Slide 51</b>  <b>Crossings and Intersections</b>  <b>Continued...</b>                  Duration: 00:00:15                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Whenever possible, designers should consider minimizing crossing distances, while drivers should be able to clearly determine pedestrians’ intent to cross in specific, designated areas. Additionally, designers should be aware of the effect that speed has regarding the placement of crossings, as higher speed zones would require more stopping distance between vehicles and the crossing areas to mitigate the chances of serious injury to and/or death of pedestrians.</p>
<p><b>Slide 52</b>  <b>Crosswalks and Marking</b>  <b>Considerations</b>                  Duration: 00:02:20                  Advance mode: Auto</p>	<p><b>Notes:</b>                  CROSSWALKS: Crosswalks are markings on roadways that define where pedestrians should cross the street. They also serve as markings to alert drivers where to expect crossing pedestrians. Crosswalks should be applied so that they are visible to both drivers and pedestrians. They should be slip-resistant and designed according to the Manual on Uniform Traffic Control Devices ( or M.U.T.C.D.).</p> <p>-----</p> <p>CROSSWALK MARKINGS: The M.U.T.C.D. Standard states:                  *When crosswalk lines are used, they shall consist of solid white lines that mark the crosswalk. These lines shall not be less than 6” or greater than 24” in width.                  *If transverse lines (parallel lines without any center markings) are used to mark a crosswalk, the gap between the lines should not be less than 6’.                  *If diagonal or longitudinal lines (or ladder-like markings) are used without transverse lines to mark a crosswalk, the crosswalk should not be less than 6’ wide.</p> <p>*Crosswalk lines, if used on both sides of the crosswalk, should extend across the full width of pavement.</p> <p>Additional crosswalk marking standards can be found in the M.U.T.C.D. Typically, longitudinal crosswalks provide more</p>

	<p>guidance to pedestrians with vision and cognitive impairments. Ladder-like markings are even better.</p> <p>-----</p> <p><b>MARKING CONSIDERATIONS:</b> To improve the visibility of longitudinal markings at a distance, it is suggested that markings be staggered. When staggered, the markings require less maintenance, as they receive less wear and tear from tire pass-over. Additionally, it is suggested that a gap in continental, or ladder, markings be left to allow a smooth area for wheelchair passage. And, though more visible in theory, textured sidewalks are not recommended, as they create challenges for pedestrians with mobility impairments.</p> <p>-----</p> <p><b>ADDITIONAL MARKING CONSIDERATIONS:</b> PROWAG solicits that there be a 5% maximum running grade at all crosswalks. The CROSS SLOPE approaching a yield/stop sign or signal should be a 2% maximum slope. At approaches without control (such as signs or signals), the cross slope should be no more than 5%. Mid-block crossings may be equal to the street grade. And finally, a width of 10' is recommended to ensure ramps are in the crosswalk area.</p>
<p><b>Slide 53</b>  <b>Crosswalks and Ramp Placement</b>            Duration: 00:00:18            Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Where possible, it is suggested that two ramps be placed at the corner of a crosswalk intersection. Designers should plan for the shortest possible crosswalk length and keep crosswalk setback to a minimum. Minimal crosswalk setback reduces out-of direction travel and provides good sight lines between pedestrians and motorists.</p>
<p><b>Slide 54</b>  <b>Crosswalks and Ramp Placement Continued...</b>            Duration: 00:00:27            Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Small corner radii allow two ramps, short crosswalks, and direct travel paths. Small radii also make it easy to place two ramps per corner with a level landing shared by the two ramps. The level landing can then line up with both the sidewalks and the crosswalks to create a direct path of travel for users.</p> <p>Unfortunately, larger radii create large undefined areas where crossing is made more difficult. Users have a harder time trying to figure out where to cross, and it is also more difficult to conveniently place ramps and crosswalks. In cases where corners have larger radii, a single ramp reduces crosswalk setback, but this lengthens the crosswalk. Therefore, it is suggested in such cases that two ramps be placed at each corner, with a balanced distance and angle between the two.</p>
<p><b>Slide 55</b>  <b>Crossing Islands and Medians</b>            Duration: 00:00:22            Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Crossing islands and medians break one long crossing into two simpler crossings. Stand-alone crossing islands must be accessible, with a recommended minimum WIDTH of 6'. The cut-through (ramp) should be as wide as possible (5' minimum). Additionally, the ends of the cut-through should be aligned with the crosswalk. It is suggested that cut-throughs be staggered so that pedestrians face oncoming traffic in the second half. This may reduce the chance of pedestrian/vehicular contact and/or injury.</p>

<p><b>Slide 56</b>  <b>Crossing Islands and Medians</b>                  Duration: 00:00:17                  Advance mode: Auto</p>	<p><b>Notes:</b>                  At intersections, the nose of a median should extend into the crosswalk. There is a 24" detectible warning (more commonly referred to as a DW) required at both openings, at least 2' apart from one another. If ramped, there should be a minimal landing of 5'x5' between ramps.</p>
<p><b>Slide 57</b>  <b>Overcrossings and Undercrossings</b>                  Duration: 00:00:33                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Generally, overcrossings work best if the roadway is lowered, as a ramped overcrossing can prove difficult to climb for those pedestrians with limited mobility. An though overcrossings are expensive to build correctly, when built, they should incorporate a 20' rise at 5% (or 8.3% with landings).                  Conversely, undercrossings require long ramps and send users underground, therefore undercrossings work best if the roadway is elevated and structures are open and airy, or well-lit for security purposes.</p>
<p><b>Slide 58</b>  <b>Intersections</b>                  Duration: 00:00:30                  Advance mode: Auto</p>	<p><b>Notes:</b>                  The general rule of thumb when planning for and designing intersections is: smaller is better. Intersections should be kept simple and designed for slow speeds. If they become complex, designers should break up intersections with crossing islands for the safety of crossing pedestrians.                   When considering building an intersection, designers should allow for a crossing that has small curb radii. Small curbs make crosswalk and ramp placement easier and safer for all pedestrians. Large curbs increase the crossing distance for pedestrians, make crosswalk and ramp placement more difficult, and allow drivers to make high-speed turns, all of which could be potentially disastrous for pedestrian users.</p>
<p><b>Slide 59</b>  <b>Refuge and Corner Islands</b>                  Duration: 00:00:33                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Refuge islands separate conflicts by reducing crossing distance and improving signal timing. These islands break up complex intersections, allowing for pedestrians to cross fewer lanes at one time.                   Corner island ramps should be at least 4' wide, while cut-throughs should be 5' wide, minimally. There should be a 5' area of turning space or level landing. Additionally, there must be a 2' deep DW at the ends of a cut-through or at the bottom of a ramp, with at least 2' minimum separation between the warnings. All cut-throughs and/or ramps should be aligned with crosswalks.</p>

<p><b>Slide 60</b>  <b>Refuge and Corner Islands</b>  <b>Continued...</b>                  Duration: 00:00:38                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Slip lanes, often found at islands, are independent right turn lanes provided at intersections to reduce traffic congestion by allowing a vehicle to turn right and bypass a signalized intersection while allowing traffic in through lanes to continue through the intersection. These types of lanes create a tighter turning angle so that motorists slow down at potentially dangerous pedestrian crossings. They should be considered when planners are designing refuge and corner islands for intersections. Additionally, with slip lanes, planners should always use a raised island, not a painted island.</p>
<p><b>Slide 61</b>  <b>Roundabouts</b>                  Duration: 00:00:54                  Advance mode: Auto</p>	<p><b>Notes:</b>                  According to the M.U.T.C.D., roundabouts are circular intersections with yield control of all entering traffic, channelized approaches, counter-clockwise circulation, and appropriate geometric curvature to ensure that travel speeds on the circulatory roadway are typically less than 50 km/h (or 30 mph).</p> <p>When planning for the design of a roundabout, it is important to note that a single lane is preferred around the center of the roundabout. There should be deflections at the entrances and exits of the roundabout area to encourage slowed traffic speeds. A crosswalk in a roundabout intersection is suggested to be located one car length back from the center of the roundabout intersection, while sidewalks should be separated to direct pedestrians to crosswalks. Ramps, cut-throughs, and splitter islands are suggested in larger roundabout designs to increase the safety of traveling pedestrians in the roundabout area, as well.</p>
<p><b>Slide 62</b>  <b>Roundabouts</b>  <b>Continued...</b>                  Duration: 00:00:42                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Because most pedestrians look for a gap before crossing a street, roundabouts tend to pose problems with pedestrians who have visual impairments. In this case, crosswalks can be difficult to find. Also, circulating traffic masks the sound cues used to identify gaps, while also masking the sound of yielding vehicles. Multi-lane roundabouts are more challenging for pedestrians, as there usually is less deflection entrances and exits which mean higher vehicular speeds. At high-volume multi-lane roundabouts, gaps are infrequent, making it more difficult for pedestrians with visual disabilities to determine when it is safe to cross.</p>
<p><b>Slide 63</b>  <b>Roundabouts</b>  <b>Continued...</b>                  Duration: 00:00:27                  Advance mode: Auto</p>	<p><b>Notes:</b>                  It is suggested that audible or tactile cues be placed at roundabouts to indicate proper crossing locations. Sidewalks should be setback to guide users to the crosswalks. Also, rumble strips can be placed along the vehicle path to audibly warn pedestrians with visual impairments. Finally, not only should designers include a good sign distance between pedestrians and motorists, they should consider erecting pedestrian signals also known as "Pedestrian Beacons" (or HAWKs) to alert pedestrians of the safest crossing areas.</p>

<p><b>Slide 64</b>  <b>Program Accessibility Review Three</b>          Duration: 00:00:10          Advance mode: By user</p>	<p><b>Notes:</b> N/A</p>
<p><b>Slide 65</b>  <b>Curbs, Curb Ramps, and Detectible Warnings</b>          Duration: 00:00:33          Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Curbs are a cue for pedestrians with low vision to detect the boundary between the sidewalk and the street. Because ramps lead pedestrians into the street, Detectible Warnings (or DWs) were invented as a “replacement” cue to indicate street location to individuals with visual impairment.</p> <p>Curb ramps allow pedestrians to transition between the street and sidewalks, islands, roundabouts, etc. Curb ramps are beneficial of allowing wheelchair, stroller, delivery cart, and rolling luggage access to the roadway when transitioning from place to place. They are typically installed at:</p> <ul style="list-style-type: none"> <li>• Intersections with one ramp at the end of each crosswalk</li> <li>• Mid-block Crossings (including trail crossings)</li> <li>• Accessible on-street parking spaces, and</li> <li>• Passenger loading zones</li> </ul>
<p><b>Slide 66</b>  <b>Curbs, Curb Ramps, and Detectible Warnings Continued...</b>          Duration: 00:00:08          Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Curb ramps consist of five (5) components: the Approach, the Landing, the Ramp (with DW), the Flare, and the Gutter.</p>
<p><b>Slide 67</b>  <b>Accessible Curbs Ramps</b>          Duration: 00:01:11          Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>ADAAG states that all curb ramps shall be provided wherever the accessible route (sidewalk) crosses a curb. Where ramps are located, grade changes must take place at right angles to ensure that all four wheels of wheelchairs, strollers, and such are in contact with the ground at all times. The following outlines specifications applicable to curb ramp design, as it relates to ADAAG and PROWAG regulations:</p> <p>RUNNING SLOPE: The Maximum running slope allowable is 1 to 12 (or 8.3%)          CROSS SLOPE: The Maximum cross slope should be 1 to 50 (or 2%).          WIDTH: The acceptable width of a curb ramp is 36” (or 3’), minimally.</p>

	<p>RAMP GRADE: The maximum allowable ramp grade is 1 to 12 or 8.3% (plus a 5% grade at the adjacent street for a total of 13.3%). The recommended maximum grade to allow for construction tolerance is 1 to 14 or 7.1%.</p> <p>RAMP LENGTH: The ramp length can be determined by dividing the Curb Height by the difference between the Ramp Slope and the Sidewalk Cross Slope.</p>
<p><b>Slide 68</b>  <b>Accessible Curbs Ramps</b>  <b>Continued...</b>                  Duration: 00:00:47                  Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>RAMP WIDTH: The minimum allowable ramp width is currently 3' under ADAAG. However, PROWAG has established a 4' minimum width for ramps. Wider ramps are better.</p> <p>LANDING[1] DIMENSION: ADAAG does not specify a provision for landings of curb ramps. However, PROWAG states that landings should be 4' x 4'. Moreover, 5' x 5' ramps allow wheelchair users to turn more easily.</p> <p>LANDING SLOPE: A 1 to 48 (or 2%) maximum landing slope is allowable in any direction.</p> <p>BOTTOM LANDING: The bottom of a ramp must have a 4' x 4' level clear space outside of the vehicle travel path for pedestrian usage.</p> <p>FLARE[2] SLOPE: A 1 to 10 (or 10%) maximum flare slope is allowed for curb ramps.</p> <p>NOTE:                  *Landings may serve multiple ramps.                  *Flares are not a part of the PAR. They should be used wherever a ramp might create a tripping hazard. Curbs can be used instead of flares to provide directional cues, promoting way-finding.</p>
<p><b>Slide 69</b>  <b>Accessible Curbs Ramps</b>  <b>Continued...</b>                  Duration: 00:00:30                  Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Higher curbs and/or flatter ramp grades mean that the ramps should be long. The least slope possible is preferred when building a ramp. Finally, when "chasing grade," ramp length should not exceed 15'. However, the slope must be uniform per ADAAG regulations. Also, transitions from curb ramps to walks, gutters, or streets shall be flush and free of abrupt changes. Detectable Warnings should have truncated domes and shall extend the full width of the depressed area.</p>
<p><b>Slide 70</b>  <b>Accessible Curbs Ramps</b>  <b>Continued...</b>                  Duration: 00:00:24                  Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>At marked crosswalks, curb ramps shall be wholly contained within the markings, excluding the flared sides. Diagonal Curb Ramps are corner-type curb ramps located at the apex (or midpoint) of the curb radius, serving two crosswalks. These have special design requirements. Raised Traffic Islands, when constructed to divide roadways, should be cut through level. If they are not cut through level, these islands should have curb ramps.</p>
<p><b>Slide 71</b>  <b>Accessible Curbs Ramps</b>  <b>Continued...</b>                  Duration: 00:00:12                  Advance mode: Auto</p>	<p><b>Notes:</b></p> <p>Ramp surfaces must be firm, stable and slip-resistant, with the exception of the DW located at the end of the ramp. Grates, covers, and such should not be located on ramps or landings. If placement of such elements on a ramp is necessary, then normal surface requirements apply.</p>

**Slide 72**  
**Types of Curb Ramps**

Duration: 00:03:54  
 Advance mode: Auto

**Notes:**

INTRODUCTION: So far, we have discussed several elements associated with curbs and curb ramps. But, now we will take a few moments to review the types of curb ramps available. You will find that their naming conventions identify their design and position relative to the sidewalk or street.

PERPENDICULAR: Perpendicular curb ramps have ramp slope that is perpendicular to the curb. As a matter of fact, it is the only ramp type shown and/or referenced in the ADAAG. However, PROWAG provides a wider range of options for different situations. These types of ramps can not only be placed at a block's corner, but can also be placed midblock with level landings, as without a landing, a wheelchair user would have to turn their chair while also climbing a slope. Also, without landings, pedestrians continuing along sidewalks might experience severe cross-slope. It is important to remember that ramps without landings can be retrofitted by adding a landing behind the ramp.

PARALLEL CURB RAMPS: Parallel curb ramps are those ramps where two ramps lead to a turning space at the bottom. The ramp is parallel to the curb. In the ideal situation, two ramps are preferred, similar to perpendicular curb ramp placement, but pedestrians continuing on the sidewalk must negotiate 4 ramp grades in such a case. It is usually good to construct a landing between 2 adjacent ramps. This landing doesn't need to be full curb height, but 3" in height is recommended, minimally, for drainage. In this case, ramps and crosswalks can be placed close together. For parallel curbs, if the landing at the bottom of the ramp is less than 5' deep, the DW should be placed at the grade break. Additionally, if the landing is 5' plus deep at any point the DW should be placed on the bottom of the landing.

COMBINATION CURB RAMPS: Combination curb ramps usually exit where parallel ramps lower the elevation of the landing, or where perpendicular ramps connect a landing to the street. Combination ramps are useful where a sidewalk has a steep grade, high curbs, or where usual geometry makes it difficult to use other types of curbs. These types of curbs can be expensive. However, if it means making travel safe and accessible for all pedestrians it is recommended where other "options" are considered.

BUILT-UP CURB RAMPS: Built-up curb ramps project from the curb into the street. These types of ramps expose users to cars in the roadway. Therefore, they are not the most favorable type of ramps. They should only be used where they are protected by a parking lane. Additionally, designers should consider that this type of curb might interfere with bicycling and may also make drainage difficult.

DIAGONAL CURB RAMPS: Diagonal (or Single) curb ramps are single ramps (usually perpendicular) located at the apex of a corner. These type of ramps force wheelchair users out of the crosswalk, and also force out-of-direction travel. Where feasible, it is preferred that two ramps be used per corner at an intersection/crosswalk area. Diagonal ramps must have a bottom clear space within crosswalk markings, if the crosswalk is marked. Diagonal curb ramps should only be used with curbs that have larger radii (15' or more) to allow 48" of clear space outside vehicle travel lanes.

BLENDED TRANSITIONS: Blended Transitions are usually found when sidewalk elevation lowers to a street with gradual slope change (such as an expanded diagonal ramp around an entire corner). Because of such transitions, it may be difficult for children, people with cognitive impairments, and dog guides to distinguish the street edge from the sidewalk. Blended transitions may also allow turning vehicles to encroach onto a sidewalk, in which case bollards can be used to mitigate such risk. DWs should be placed along the entire transition at blended transitions to ensure the safety of all pedestrians.

<p><b>Slide 73</b>  <b>Other Curb Considerations</b>          Duration: 00:00:14          Advance mode: Auto</p>	<p><b>Notes:</b>          Now that we have reviewed the types of curb ramps available to designers for consideration, we will discuss a few additional elements associated with curb construction including:</p> <ul style="list-style-type: none"> <li>• Curb Extensions</li> <li>• Curb Drainage, and</li> <li>• Detectible Warnings</li> </ul>
<p><b>Slide 74</b>  <b>Curb Extensions</b>          Duration: 00:00:26          Advance mode: Auto</p>	<p><b>Notes:</b>          Curb extensions reduce the crossing distance between two sidewalks across an intersection. They create room for ramps, improve visibility for both pedestrians and drives, and help pedestrians signal intent to cross. Additionally, curb extensions create room for street furniture and trees, leaving sidewalks obstacle-free. These extensions allow ramps to be correctly installed on narrow sidewalks so pedestrians can travel in a straight line.</p>
<p><b>Slide 75</b>  <b>Curb Drainage</b>          Duration: 00:00:26          Advance mode: Auto</p>	<p><b>Notes:</b>          Drainage at curb ramps can be difficult, as flat grades may result in standing water. Also, flush transitions allow water to flow or sit on ramps. To address such problems, it is suggested that inlets be placed upstream of ramps to catch any water flowing toward the bottom of a ramp. Another consideration to address drainage issues is to design ramps so that gutter counter-slope is flatter than the ramp. Either way, proper drainage keeps pedestrians safe and dry, making transitions clearly visible in inclement and non-inclement weather conditions.</p>
<p><b>Slide 76</b>  <b>Detectible Warnings</b>          Duration: 00:00:50          Advance mode: Auto</p>	<p><b>Notes:</b>          Detectible warnings (or DWs) are textural patterns placed at the end of ramps for the indication of transition from sidewalks into roadways. Detectible Warnings also indicate where the curb would be. These DWs alert pedestrians with visual impairments about the sidewalk/street interface. DWs are required wherever a walkway crosses a vehicular way, excluding unsignalized driveways. You will see them at curb ramps, medians, islands, rail crossings, and transit platforms. Small, truncated domes measuring 0.9” to 1.4” in length by 50% to 60% of the length in width by 0.2” in height are placed at the end of curb ramps so that they are detectable by cane and under one’s foot.</p>
<p><b>Slide 77</b>  <b>Detectible Warnings Continued...</b>          Duration: 00:00:28          Advance mode: Auto</p>	<p><b>Notes:</b>          DWs should be 24” deep at the back of the curb extending the full width of the curb ramp. Domes should be aligned with the direction of pedestrian travel on ramps. DWs are not needed on the flares. Additionally, DWs must have visual contrast, be it textural or of a colored nature (such as light color on a dark surface and vice versa) so that those with slight visual impairments may distinguish between the sidewalk and the ramp opening into the roadway. Also, DWs should not be used at unsignalized driveways, as this may confuse visually impaired pedestrians.</p>

<p><b>Slide 78</b>  <b>Pedestrian Signs</b>                  Duration: 00:00:20                  Advance mode: Auto</p>	<p><b>Notes:</b>                  According to the M.U.T.C.D., “the functions of signs are to provide regulations, warning, and guidance information for road users.” As such, it is expected that pedestrian signs not be placed in locations where they obstruct the minimum clearance width or they protrude into the pathway designated for pedestrian travel.</p>
<p><b>Slide 79</b>  <b>Pedestrian Signs Continued...</b>                  Duration: 00:00:23                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Current ADAAG requirements specify that signage is expected to generally comply with ADAAG provisions. These provisions indicate that letters and numbers on signs shall have a width-to-height ratio between 3 to 5 and 1 to 1. Letters should also possess a stroke-width-to-height ratio between 1 to 5 and 1 to 10. Additionally, characters and numbers on signs should be sized according to the viewing distance from which they are expected to be read, where the minimum height is measured using and uppercase “X”.                   Note: Lowercase characters are permitted.</p>
<p><b>Slide 80</b>  <b>Pedestrian Signs Continued...</b>                  Duration: 00:00:26                  Advance mode: Auto</p>	<p><b>Notes:</b>                  With the use of raised and Brailled characters and pictorial symbol signs (or pictograms), letters and numerals should be raised .8 mm, minimally. Uppercase, sans serif or simple serif typesetting shall be used, in accompaniment with Grade 2 Braille. Additionally, raised characters are expected to be at least 16mm high, but no higher than 50mm. Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. Finally, the border dimension of the pictogram shall be 152mm, minimally, in height.</p>
<p><b>Slide 81</b>  <b>Pedestrian Signs Continued...</b>                  Duration: 00:00:14                  Advance mode: Auto</p>	<p><b>Notes:</b>                  The characters and background of signs shall be eggshell, matte, or other non-glare finish. In addition, characters and symbols should contrast with their background – either light characters on a dark background or vice versa.</p>
<p><b>Slide 82</b>  <b>Pedestrian Signs Continued...</b>                  Duration: 00:00:19                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Generally, most agencies comply with the M.U.T.C.D. for guidelines on signage, in which case signage would meet most accessibility criteria for character proportion, height, and contrast. However, if signage is used in the right-of-way, it should be implemented with audible or tactile information to ensure its accessibility to all persons, including those with visual impairments.</p>

<p><b>Slide 83</b>  <b>Pedestrian Signals</b>                  Duration: 00:01:60                  Advance mode: Auto</p>	<p><b>Notes:</b>                  ACCESSIBLE PEDESTRIAN SIGNALS: Accessible Pedestrian Signals provide users with visual and/or cognitive disabilities (as well as children) the information they need to adequately and safely navigate the PROWs across our nation. The inclusion of audible, tactile, and vibrotactile aids enhances an impaired user's ability to better utilize the roadways and sidewalks, decreasing the chances of accident or injury.                  -----                  APS DESIGN: APS's are designed to increase the efficiency of pedestrian timing and can make pedestrian actuated devices accessible and usable by all pedestrians. Audible tones and speech messages are designed to provide standard information regarding the signal cycle (such as WALK, DON'T WALK). Additionally infrared or Light Emitting Diodes (or LED) transmitters can be used to send speech messages to personal receivers.                  -----                  USE IN PROWS: When used in PROWs, pedestrian signal devices are expected to provide tactile and visual signs on the face of the device or on its housing or mounting unit to indicate crosswalk direction and the name of the street containing the crosswalk served by the pedestrian signal. The physical design, placement, and location of the pedestrian signal devices should be accessible to pedestrians with vision and/or mobility impairments.</p>
<p><b>Slide 84</b>  <b>Maintenance and Construction: Construction Site Safety</b>                  Duration: 00:00:27                  Advance mode: Auto</p>	<p><b>Notes:</b>                  In many places across the United States, construction occurs on a daily basis. In many cases access to curb ramps and accessible alternative routes are not provided. Sometimes, pedestrians are even forced to take circuitous or dangerous alternative routes. There may be equipment or materials that block passageways. In other instances there may be a failed provision of detection around a site regarding the dangers that exist. As such, ADAAG requires that safety measures be taken into consideration when construction takes place in any area...especially high-traffic areas.</p>
<p><b>Slide 85</b>  <b>Maintenance and Construction: Construction Site Safety Continued...</b>                  Duration: 00:00:29                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Therefore, construction sites must provide a continuous, safe, accessible path of travel. At all costs, the areas should avoid displacing pedestrians. According to the M.U.T.C.D., the needs and control of all road users, including pedestrians with disabilities, shall be an essential part of highway construction, utility work, and maintenance operations. Furthermore, provisions for pedestrian safety shall be provided after appropriate evaluation and engineering judgment.</p>
<p><b>Slide 86</b>  <b>Maintenance and Construction: Construction Site Safety Continued...</b>                  Duration: 00:00:41                  Advance mode: Auto</p>	<p><b>Notes:</b>                  Accessible barricades should be provided when construction occurs in the public right-of-way. Barriers defining the alternate route should be a minimum of 36" to 42" in height and should be continuous with the ground surface. The barriers, such as temporary ramps and boardwalks, should also extend around the entire perimeter of the construction site or should run the entire length of the alternate circulation route. Ineffective barriers, such as plastic tape, should not be a first choice when erecting or putting barriers in place around construction sites. Additionally, when a temporary pedestrian route is in the roadway, crash-resistant barriers should be provided.</p>

<p><b>Slide 87</b>  <b>Maintenance and Construction: Temporary Facilities</b>                  Duration: 00:00:33                  Advance mode: Auto</p>	<p><b>Notes:</b>                  According to the M.U.T.C.D., when existing pedestrian facilities are disrupted, closed, or relocated, the temporary facilities shall include accessibility features consistent with the features present in the existing facility. A temporary accessible path should replicate, as much as practical, the desirable characteristics of the existing pedestrian facilities. Temporary construction, alternate paths, and temporary facilities (including temporary safe pedestrian passage around a construction site) must be ADAAG-compliant.</p>
<p><b>Slide88</b>  <b>Program Accessibility Final Review</b>                  Interaction type: Choices                  Passing score: 70                  Instructions: None                  Custom Message: None</p>	<p><b>Questions:</b></p> <ol style="list-style-type: none"> <li>1. _____ are a cue for pedestrians with low vision to detect the boundary between the sidewalk and the street.                         <ol style="list-style-type: none"> <li>1) Signs</li> <li>2) Curbs</li> <li>3) Awnings</li> <li>4) Trees</li> </ol> </li>   <li>2. Curb ramps consist of five components. Which of the following is NOT one of the five components of curb ramps?                         <ol style="list-style-type: none"> <li>1) Header</li> <li>2) Approach</li> <li>3) Landing</li> <li>4) Flare</li> <li>5) Gutter</li> </ol> </li>   <li>3. These are textured patterns placed at the end of ramps to indicate the transition from sidewalks into roadways.                         <ol style="list-style-type: none"> <li>1) Curbs</li> <li>2) Textured Concrete</li> <li>3) Detectible Warnings</li> <li>4) Gravel</li> </ol> </li>   <li>4. According to the MUTCD, pedestrian signs function to provide regulations, warnings, and guidance information for road users.                         <ol style="list-style-type: none"> <li>1) True</li> <li>2) False</li> </ol> </li> </ol>
<p><b>Slide 89</b>  <b>END OF MODULE</b>                  Duration: 00:00:15                  Advance mode: Auto</p>	<p><b>Notes:</b> N/A</p>