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Road TTAP Talk

Access Board to Revise and Update ADA Standards

(Proposed Standards Affect Design of Pedestrian Facilities and Roundabouts)

by Terrance Hill, E.I.T.

The Architectural Barriers Act (ABA) passed in 1968 following a series of lawsuits spanning many years, asserting the exclusion of persons with disabilities or physical and mental limitations from accessing facilities in their community and addressing societal barriers. The ABA requires that all structures designed, constructed, altered, or leased using federal funding be accessible to everyone. However, social injustices were not addressed until the Rehabilitation Act in 1973. This act prohibited discriminatory practices against individuals with disabilities in any program or activity that received federal funding. It also created the Access Board, which is responsible for ensuring that federal entities establish and comply with accessibility design guidelines. These statutes, in addition to others, progressively laid the framework for the American with Disabilities Act (ADA) in 1990.

The ADA, viewed as a civil rights act, was the first comprehensive legislation committed to removing or reducing barriers related to employment, transportation, public accommodations and services, and telecommunications. Previous laws centered on federally funded programs. ADA facilities requirements are extended to private entities as well. Under the ADA, the Access Board maintained most of its previous responsibilities. It also began to officially conduct research to validate its guidelines and formed technical assistance programs to answer questions and concerns. In 1991, the Board published the ADA Accessibility Guidelines (ADAAG), which outlines requirements mainly for buildings, but also includes a section on transportation facilities. Since the introduction of the ADAAG, the Access Board has created and updated standards and established committees that examine specific issues. In an effort to create thorough guidelines for the public right-of-way (that include more than common facilities such as sidewalks and ramps), the Access

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RoadTalk is a publication of the Tennessee Transportation Assistance Program (TTAP). TTAP is part of a nationwide Local Technical Assistance Program (LTAP) financed jointly by the Federal Highway Administration (FHWA) and Tennessee Department of Transportation (TDOT). Its purpose is to translate into understandable terms the latest state-of-the-art technologies in the areas of roads, bridges, and public transportation to local highway and transportation personnel.

The views, opinions, and recommendations contained within this newsletter are those of the authors and do not necessarily reflect the views of FHWA and TDOT.

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From the Director

As I sit here before my computer to compose my thoughts for this issue, the autumn leaves have about fallen and Thanksgiving is right around the corner. It's incredible that 2009 is already coming to a close. How the months have flown by!

One of the things I've been participating in during the past several months is a project to enhance transportation planning in our state's rural counties. As part of this project, staff at the University of Tennessee Center for Transportation Research are working with planners in the Local Planning Assistance Office of the Tennessee Department of Economic and Community Development to evaluate the local roadway network in selected counties across the state. TTAP is helping to assess network condition, evaluate capacity and level of service, identify safety issues, and assess existing and future infrastructure needs. The study team is also examining local roadway budgets and funding sources.

While our work is still ongoing, what I've seen so far probably won't surprise many of you. First, money for local roads and streets is exceedingly tight. The needs we have identified so far greatly exceed available funds. Counties are heavily dependent upon state supplied dollars; revenue from sources such as property taxes, wheel taxes, and the like is not uniformly available. Second, our local roadway departments are working heroically to keep roads in good shape. However, given rising prices for materials, salaries, and other expense items and static or declining gas tax revenues, the future will be very challenging.

Many local roads are a legacy of a bygone era when the policy was simply to provide rural farmers with a reliable way to get to market. To keep costs low, these roads often followed convenient routes and were constructed to standards now outdated. With low traffic volumes and familiar users, such roads served their purpose adequately. However, as our rural counties experience retirement related development, or as suburban fringe areas expand into these counties, traffic growth on many local roads will create operational difficulties and safety concerns.

While good in many ways, development is not consistently resulting in additional funding to address associated impacts on local roads. Moreover, we see little ability of highway officials to address these problems with existing or forecasted funding levels. Without coordination between land use planning and transportation in our counties, and the funding of development related highway needs, our hard working local highway agencies will face a crisis. With development temporarily slowed by the economy, we have some time to address this problem. Our challenge is to take advantage of the opportunity.

As always, please feel free to contact TTAP for technical assistance, training, or information. We look forward to serving you.

Roundabouts as a Proven Safety Countermeasure

reprinted from Fall 2009 Safety Compass, FHWA

What Is a Roundabout?

The modern roundabout is a type of circular intersection defined by the basic operational principle of entering traffic yielding to vehicles on the circulatory roadway, combined with certain key design principles to achieve deflection of entering traffic by channelization at the entrance and deflection around a center island. Modern roundabouts have geometric features providing a reduced speed environment that offers substantial safety advantages and excellent operational performance.

Roundabouts Are Effective!

Roundabouts have demonstrated substantial safety and operational benefits compared to other forms of intersection control, with reductions in fatal and injury crashes from 60 - 87 percent. The benefits apply to roundabouts in urban and rural areas and freeway interchange ramp terminals under a wide range of traffic conditions. Although the safety of all-way stop control is comparable to roundabouts, roundabouts provide much greater capacity and operational benefits. Roundabouts can be an effective tool for managing speed and transitioning traffic from a high speed to a low speed environment. Proper site selection and channelization for motorists, bicyclists, and pedestrians are essential to making roundabouts accessible to all users. Particularly at higher speed roundabouts, it is important to ensure safe accommodation of bicyclists and pedestrians who have visual or cognitive impairments.

This multilane roundabout in Dublin, OH, was installed to address safety concerns at this location. (Photo credit: City of Dublin, OH)

Where Can I Use Roundabouts?

Roundabouts are the preferred safety alternative for a wide range of intersections. Although they may not be appropriate in all circumstances, they should be considered as an alternative for all proposed new intersections on Federally-funded highway projects, particularly those with major road volumes less than 90 percent of the total entering volume. Roundabouts should also be considered for all existing intersections that have been identified as needing major safety or operational improvements. This would include freeway interchange ramp terminals and rural intersections.

Q&A - Roundabouts

Q: How do roundabouts accommodate pedestrians and bicyclists?

A: At a roundabout, pedestrians should be accommodated with a sidewalk around the entire perimeter of the intersection, and pedestrians should not cross the traveled way to enter the central island. Most roundabout design guidelines recommend offsetting the pedestrian crossing by one to three car lengths in advance of the roundabout yield line, which not only shortens the crossing distance but allows motorists approaching the roundabout to yield to pedestrians in the crossing be-

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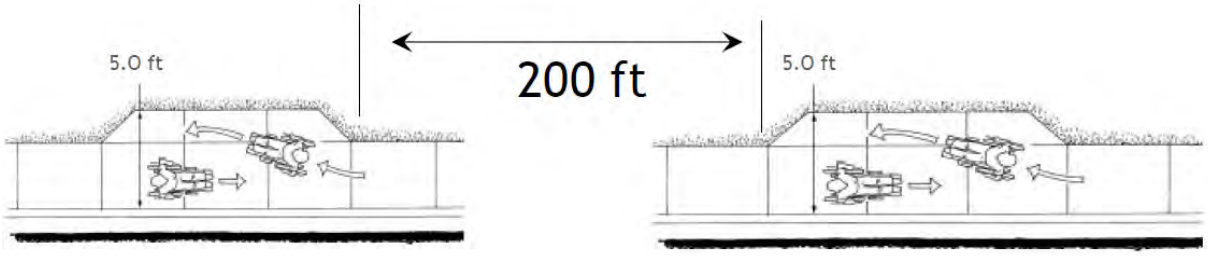

Board is currently developing the Public Right-Of-Way Accessibility Guidelines (PROWAG). The PROWAG is a separate document rather than an addition to the ADAAG; therefore, guidelines that conflict will be supplanted by those in the PROWAG.

According to the United States Census 2000, approximately 54 million people age 15 and older have some degree of physical or mental disability. Nearly 17 million have hearing impairments, and 10 to 12 million have varying degrees of visual disabilities. As the population continues to age, the number of individuals with short-term and long-term disabilities is expected to increase.

The PROWAG covers a variety of issues, and the following paragraphs outline a few changes and additions that are expected to be incorporated in the final draft.

Section R301: Pedestrian Access Routes

Sidewalks, ramps, curb ramps and landings, blended transitions, crosswalks, elevators and platform lifts, and pedestrian underpasses and overpasses are all components that define a pedestrian access route.

- A minimum width of 1.2 m (4 ft) shall be maintained, free of obstructions and obstacles, on pedestrian access routes, and that width shall not include the width of the curb.
- If a pedestrian access route has less than 1.5 m (5 ft) of clear width, a 1.5 m x 1.5 m (5 ft x 5 ft) passing zone must be positioned at intervals no more than 61 m (200 ft) apart.
- The maximum allowable cross slope of a pedestrian access route shall be 2 percent. Additionally, where a pedestrian access route is within a street or highway border, its grade shall not exceed the grade established for the adjacent traveled way.
- Vertical surface discontinuities along pedestrian access routes shall not exceed 13 mm (0.50 in), and discontinuities between 6.4 mm (0.25 in) and 13 mm (0.50 in) shall be beveled across the entire level change at 1:2 minimum.
- Horizontal openings shall not permit the passage of a sphere more than 13 mm (0.50 in) in diameter. Elongated openings shall be placed so that the long dimension is perpendicular to the prevailing direction of travel.

Section R303: Curb Ramps and Blended Transitions

For individuals with vision impairments, curb ramps provide basic wayfinding information if they are aligned with the direction of pedestrian travel at intersections. Blended transitions, usually encompassing the entire length of curve radii at intersections, are ramps where the pedestrian access route gradually lowers to the level of the adjacent street or intersection.

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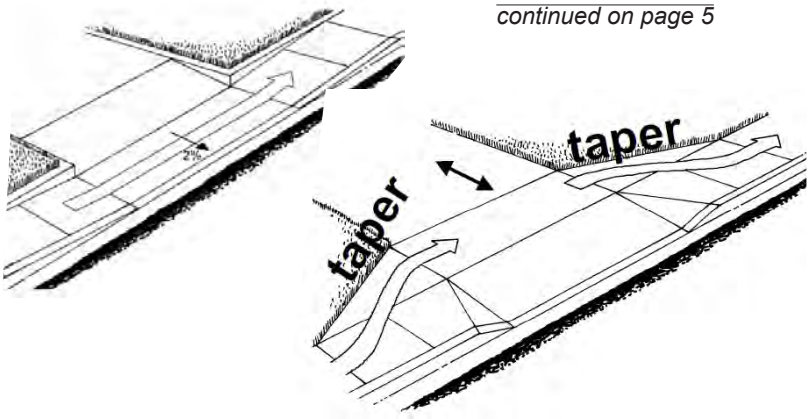
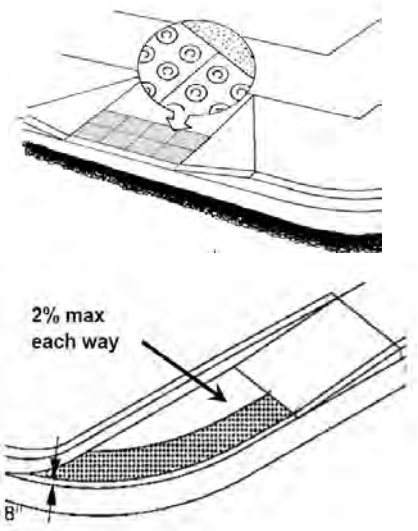
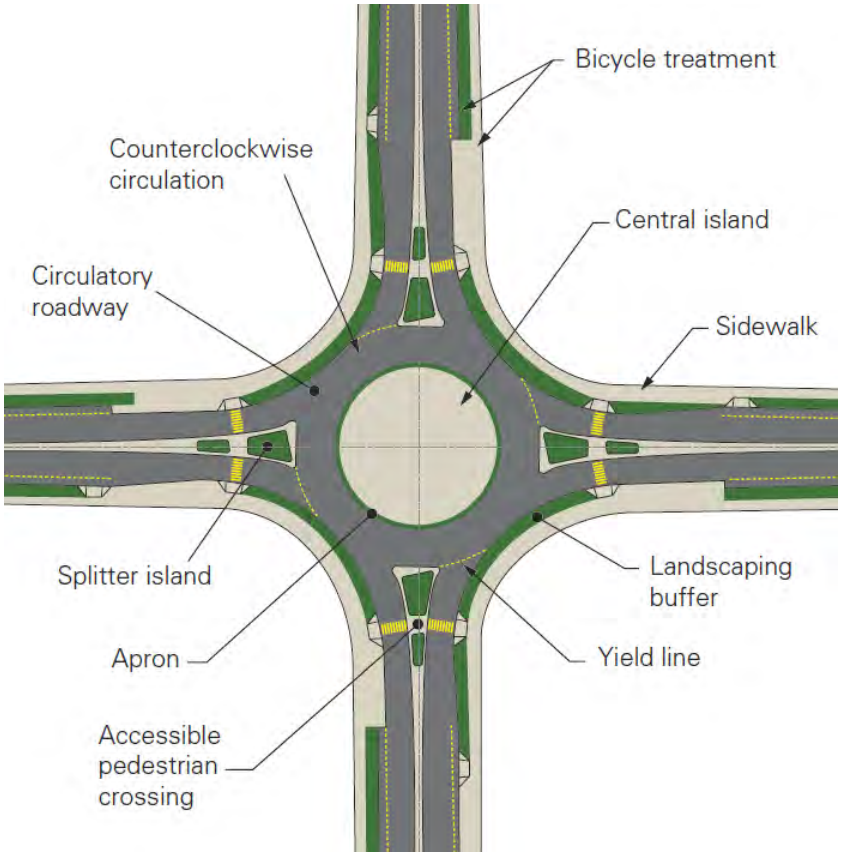


- The longitudinal slopes of ramps shall be a minimum of 5.0 percent and a maximum of 8.3 percent, and the length shall not exceed 4.5 m (15 ft).
- A 13.3 percent difference in grade shall be the maximum allowable when transitioning between the gutter of an adjacent street and a pedestrian walkway ramp. However, a 610 mm (2 ft) level area is recommended when the difference in grades exceeds 11 percent.

Section R304: Detectable Warning Surfaces

- Detectable warning surfaces notify pedestrians with no or low visibility of the walkway to street level transition, and shall consist of truncated domes aligned in a square or radial grid pattern.
- Detectable warning surfaces shall contrast visually with adjacent gutter, roadway, or walkway surface, and shall extend a minimum of 610 mm (24 in) in the direction of travel and across the full width of the ramp (excluding flares) or blended transition at the back of curb.





Section R305: Pedestrian Crossings

- Marked crosswalks shall be a minimum of 1.8 m (6 ft) wide with a recommended width of 3.0 m (10 ft) to ensure that ramps are within the crosswalk.
- Pedestrian refuge islands must be a minimum of 1.8 m (6 ft) in length, and if ramped, a landing area measuring at least 1.2 m x 1.2 m (5 ft x 5 ft) shall be used.
- At roundabouts with multi-lane crossings, pedestrian activated signals shall be provided for each crosswalk including the splitter island.
- If a pedestrian access route, along a roundabout, is curb-attached, there shall be a continuous and detectable edge treatment along the street side of the pedestrian access route where a crossing is not intended.

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Section R306: Accessible Pedestrian Signals (APS)

An APS is a device that relays information, with audible tones or verbal messages and vibrating (vibrotactile) surface, to pedestrians regarding the timing of the pedestrian signal intervals.

- Each crosswalk with pedestrian signal indication shall have an APS that includes both audible and vibrotactile indications of the WALK interval.
- Where a pedestrian pushbutton is provided, it shall be integrated into the APS, and shall include an integrated locator tone.
- Pedestrian signal devices shall provide tactile and visual signs on the face of the device or its housing or mounting to indicate crosswalk direction and the name of the street containing the crosswalk served by the pedestrian signal.

Section R307: Street Furniture

- Where benches without tables are provided at a single location, at least one, but no less than 50 percent, shall have a seat height at the front edges of 43 cm (17 in) minimum and 49 cm (19 in) maximum above the ground or floor space.

Section R308: Parking

- Perpendicular or angled spaces shall require a street level access aisle with a minimum width of 2.4 m (8 ft), and shall be marked to discourage parking.
- For parallel on-street parking spaces that exceed 4.3 m (14 ft), the width of an adjacent street level access aisle shall be a minimum of 1.5 m (5 ft). The access aisle's width is included in the width of the parking space, and shall not encroach on a vehicular travel lane. For spaces that are less than or equal to 4.3 m (14 ft), an access aisle is not required, but the space shall be located at either end of the block.

Implementation of the PROWAG can be traced back to the early 1990's, the first concerted effort took place in 1999 with the creation of an advisory committee, which included individuals from disability organizations, public works departments, transportation and traffic engineering groups, design engineers, and other government agencies. Following the advisory committee's recommendations, the Access Board published an initial draft of guidelines in June 2002 to obtain public comments. In November of 2005, a revised draft was released in an effort to collect information for a cost and benefit impact analysis; however, at this time, the revised draft has not been presented for public comment. There is no specific date for when the final draft will be published, but it is expected in the first quarter of 2010. Although the guidelines will not be enforceable until U.S. Department of Justice and the U.S. Department of Transportation adopt the measures, they are recommended best practices by the Federal Highway Administration. When the PROWAG is finally approved, the requirements shall be implemented with all new construction, and modifications shall comply to the maximum extent feasible within the scope of the project. Existing facilities will not have to be retrofitted to meet the new standards. The following websites contain more information on current and forthcoming ADA guidelines.

- http://www.access-board.gov/prowac/
- http://www.access-board.gov/adaag/html.adaag.htm
- http://www.ada.gov/

New to the TTAP Library

Operators Pre-Start Motor Grader Inspection (72 minutes, 2009) Motor graders are routinely used by city/county road agencies. This training video focuses on the operator's pre-start inspection (sometimes referred to as a pre-start "walk-around") of the motor grader. It was recorded during a live training session conducted by Texas Engineering Extension. We recommend supervisors present this video one section at a time, and follow up with a discussion of the points presented during that segment.

On the Web: Traffic Signal Management: It's About Time Cost Effective Street Capacity and Safety, http://ops.fhwa.dot.gov/arterial_mgmt/video/its_about_time.wmv

Webinar: Taking Proper Care of Pedestrians in Work Zones, http://www.workzonesafety.org/video_viewer.php?id=beaa3f4e-34b9-4953-94ab-9df30a642e45&width=990&height589

fore they are at the roundabout merge line. Pedestrians only have to cross one direction of traffic at a time, with the splitter island in the median providing refuge, and traffic approaching a roundabout is moving at relatively slow speeds. Roundabouts have fewer conflict points than traditional intersections, and left turns across opposing traffic are eliminated. For all of these reasons, roundabouts, particularly single-lane ones, offer significant safety advantages for pedestrians over other types of intersections.

Roundabouts offer similar advantages for bicyclists. Roundabouts do not have striped bike lanes within the circulatory roadway. A bicyclist using a roundabout can proceed either as a motor vehicle by "taking a lane" or as a pedestrian by dismounting and using the sidewalk and marked crosswalk, the same as with traditional intersections. The slow vehicle speeds in a roundabout are similar to those that can be attained by experienced bicyclists. Less experienced bicyclists can choose to exit the roadway in advance of the roundabout entry and share the sidewalk with pedestrians. As with traditional intersections with multiple turn lanes, a multi-lane roundabout also becomes more difficult for bicyclists to traverse.

Q: How do roundabouts accommodate visually impaired pedestrians?

A: Since visually-impaired pedestrians rely on audible clues to know when traffic is stopped so they can cross a roadway, roundabouts present a challenge since motorists may not have to stop. Properly designed walkway edges, curb ramps, and tactile marking warning devices at the sidewalk sides of the crossing and in the splitter island aligned with the crosswalk can help in detecting where to cross. To assist in identifying when to cross, there are a number of studies underway that are looking at infrastructure-related alternatives such as:

- Pedestrian-activated traffic signals, particularly on multi-lane approaches, such as the HAWK or TOUCAN (signalization at such crossings is being proposed by the US Access Board);
- Pedestrian-activated LED flashing beacons;
- Advance transverse rumble strips;
- Raised crosswalks, or speed tables; and,
- Units carried by pedestrians to detect metal, velocity and distance.

In summary, this is an issue that is receiving a good bit of attention in identifying the best solutions for sight-impaired pedestrians at roundabouts.

Reference Documents and Guidelines:

Roundabouts: An Informational Guide (Report No. FHWA-RD-00-067)
http://www.tfhrc.gov/safety/00068.htm

Public Rights-of-Way Access Advisory
http://www.fhwa.dot.gov/environment/bikeped/prwaa.htm

Pedestrian Access to Modern Roundabouts: Design and Operational Issues for Pedestrians who are Blind
http://www.access-board.gov/research/roundabouts/bulletin.htm#CROSSING%20AT%20ROUNDABOUTS

NCHRP Project 03-78A, Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities
http://www.trb.org/TRBNet/ProjectDisplay.asp?ProjectID=834

Desktop Reference for Crash Reduction Factors, FHWA-SA-07-015, 2007
http://www.transportation.org/sites/safetymanagement/docs/Desktop%20Reference%20Complete.pdf

NCHRP Report 572: Roundabouts in the United States
http://onlinepubs.trb.org/onlinepubs/nchrp_rpt_572.pdf

Guide for the Planning, Design, and Operation of Pedestrian Facilities, American Association of State Highway and Transportation Officials, 2004.

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TALK TO TTAP

We are always looking for your comments, ideas and suggestions to help make the TTAP Program more useful to you. Please fill out and fax the form below to TTAP at (865) 974-3889 or mail to TTAP; Suite 309 Conference Center Building, Knoxville, TN 37996-4133.

1. Please send me more information on the following articles mentioned in this newsletter.

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2. Please list any additional training workshops you would be interested in attending.

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3. Please list topics for videos you would like TTAP to obtain.

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4. Please list any other ideas or suggestions on how TTAP could assist you.

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