

**ENVIRONMENTAL ACCESSIBILITY ASSESSMENT:**

Alternative Approaches for Alternate Users

<sup>1</sup>Denis Anson, MS, OTR

<sup>2</sup>Jacklyn Schwartz, MS, OTR

<sup>2</sup>Roger Smith, PhD, OTR

<sup>1</sup>*Misericordia University, Dallas PA*

<sup>2</sup>*University of Wisconsin - Milwaukee, Milwaukee, WI*

## INTRODUCTION

Accessibility in the built environment can be assessed in a number of ways, and those assessments can be applied differently based on the intended user. Buildings are designed and remodeled, and accessibility should be designed in. To meet this need, the requirements for accessibility must be clearly expressed and readily available. After a building is completed, it may be used in new ways that require the application of accessibility standards that were not originally relevant. Again, the legal requirements for accessibility must be applied.

However, from the point of view of the person with a disability, the legal requirements may be either too restrictive or insufficient to provide adequate accessibility. This paper explores different forms of accessibility measurement and their applications to the needs of different groups.

## ACCESSIBILITY DATA APPLICATIONS

### Builder-centric

When the Americans With Disabilities Act (ADA) ("Americans with Disabilities Act of 1990," 1990), and the ADA-ABA guidelines (Access Board, 2004) were promulgated, they were intended to be "applied during the design, construction, additions to, and alteration of sites, facilities, buildings, and elements." As such, they are prescriptive standards for minimal accessibility.

To the greatest extent possible within their scope, the rules are written to allow architects freedom to apply individual flavor to the buildings they design, while assuring that most people with disabilities will be able to use the services contained within.

Had the law been understood and embraced by designers of the built environment, new structures over the last two decades would have been accessible to those with physical, sensory, or cognitive limitations. Unfortunately, acceptance and application of the rules were not universal (Doherty, 1995; Mandel, 1990). As a result, many new structures and older structures being modified must be evaluated for compliance with the requirements of the ADA.

### Owner-centric

One of the most frustrating and frightening discrimination claims for a building owner is that the facility is not "accessible enough (Stackel, 2006)." Unless "enough" is clearly delineated, the owner is

constantly under the threat of a person with greater needs filing a new suit, no matter how much has already been done.

One application of disability standards such as the ADA is to clearly define what is "enough." If a building can be shown to meet or exceed the accessibility requirements of the ADA-ABA guidelines, it must be, by legal standards, accessible enough, even if some individuals with disabilities cannot access it easily.

Assessing existing buildings can be done proactively (where barriers are known to exist, to identify them and plan for changes to improve accessibility) or reactively (when being sued for inaccessibility, in an effort to mount a defense).

Proactive assessments can also be assembled by disability support groups to provide accessibility guides for residents or visitors to communities (DisabilityGuide.org, 2009). Such services allow a person with a disability to be assured of a pleasant experience when visiting a listed hotel, restaurant, or attraction.

### User-centric

While builder and owner-centric assessments increase overall accessibility, they are limited in their usefulness to any given individual. The ADA-ABA requirements are designed to provide access to all "typical" people with a disabilities. In most cases, the assessment of accessibility covers all categories of access, so that to be considered accessible to anyone, the facility must be accessible to everyone.

While this is proper for legal approaches, it may be unnecessarily restrictive for an individual with a disability. While some people are limited by physical, sensory and cognitive restrictions, most people with disabilities have more focused restrictions. They are able to move only with a wheelchair, but see and hear well. They have very poor vision, but walk using a white cane with good facility. When accessibility is treated monolithically, the typical person with a disability may be informed that a site is inaccessible, though the barriers are not important to the person asking. A person in a wheelchair may be warned not to go to a facility because it lacks Braille signage, for example.

Even within broad categories of access, there are variations in the needs of the individual. A child in a pediatric wheelchair may be able to move freely through doorways that do not provide the required 32 inches of free passage. An adult in a bariatric chair, on the other hand, will not be able to pass through doors

that meet the legal requirements. For individual accessibility to the community, standards compliance provides only a broad outline of accessibility needs.

## **ACCESSIBILITY DATA COLLECTION APPROACHES**

While the ultimate goal of all accessibility assessments is to determine if “individuals with disabilities” have access to the environment, there are two approaches to measurement that differ in their approach and demands on the assessor. These two approaches, criterion based and object based, each have unique strengths and weaknesses.

### Criterion Based

Criterion-based measurement systems are used to determine whether or not the thing being measured meets or exceeds the minimum standard. An educational program might require 80% success to progress to the next year of matriculation. A certification exam might require more than 250 points to achieve certification. The common feature of criterion-based measurement systems is that the actual score achieved is of little import. All that matters is that the criterion be met.

A criterion-based measuring device requires only a single reference mark: the criterion level. The assessor need only determine that the target falls on the “correct” side of this line. However, the assessor must know which side of the line is the “correct” side of the criterion. Consider, for example, the ADA standard measurement of 48 inches. According to ADA-ABA standard 308.3.2 (Access Board, 2004), the maximum high reach for an operable control is 48 inches above the floor. In the majority of cases, the distance from the floor to a feature must be less than 48 inches to meet standard. However, when measuring the height of signage, according to standard 703.4.1 the baseline of the lowest row of letters in a sign may not be lower than 48 inches. As this example shows, it is not enough to know where the criterion lies. The assessor must also know which direction from criterion equals success. It is this requirement that is limiting in many instances of building design. If a contractor does not know which direction indicates increased accessibility, the best solution is to build features just at the criterion. However, since the criterion represents “minimum accessibility,” the result is, even for structures that are ADA compliant, the structure is only “just” accessible.

The advantage of criterion-based measurements is that, in most cases, precision is not critical. So long as the measurement is “at least” at criterion, the precise value is unimportant.

### Object Based

Object-based assessments take a very different approach, and make different demands on the assessor.

In object-based measurements, the assessor records the measurements found in the environment, and need make no judgements about the suitability of the measurement. In measuring a tactile sign, for example, the assessor might record the height and width of a letter “N”, the space between two letters, the width of the stroke of the letters, and the distance from baseline to baseline on the sign. The distance from the floor to baseline of the letters of the sign would also be recorded.

In this type of measurement, assessors need to be trained to make measurements of sufficient precision using appropriate tools, and which measurements to make, but are not required to understand any of the accessibility requirements.

In some cases, measurements with a precision of 1/8 inches or less might be required (e.g. the stroke width of a sign font), while in other cases (e.g. the viewing distance of a media presentation), a measurement within an inch might be adequate.

## **APPLICATION OF CRITERION AND OBJECT BASED MEASUREMENTS**

While both types of accessibility assessment are “correct,” they are correct for different applications.

Builder-centric applications require criterion based standards in order to allow for artistic expression in building design while clearly indicating requirements. Doors, signs, and stairs must meet the stated requirements, but may have variations that accommodate individual styles.

One of the problems with the current standards as promulgated by the U.S. Access Board is that, in order to be comprehensive, the language is often obscure and difficult to parse. For example, a door may be approached directly, from the latch side, or from the hinge side, and the door may swing toward or away from the individual. In order to account for the accessibility requirements of all of these options, tables like 404.2.4.1 are used. Accurate application of such standards can be quite challenging.

Owner-Centric accessibility assessments can be either criterion referenced or object referenced. While the assessment ultimately must be compared with the criterion values, the assessor can make appropriate measurements during the assessment and interpret them after the fact.

One significant advantage of object-referenced assessments for existing structures is that different criteria may apply in different localities, or existing criteria may change over time. Although federal law does not allow state or local municipalities to have less stringent accessibility requirements than the federal rules, it does not prohibit local government from setting higher standards for accessibility. A structure that meets federal criteria may fail to provide accessibility to the standards of a community.

Object based measurements, because they focus on “what is there,” can later be compared to the prevailing standards, and the field assessor need not modify the measurement process in any way.

User-centric applications may benefit, to some extent, from criterion based assessments, but only to a limited extent.

Consider, for example, community accessibility databases like DisabilityGuide.org (DisabilityGuide.org, 2009). In order to be included in this guide, facilities will have been evaluated for features that they include. If an individual developed a personal profile that indicated which accessibility standards applied to that person’s needs, it would be possible to compare that profile with the assessment of community facilities to create a customized list and ranking of facilities.

However, if that community database were object-centric, a much more customized listing might be evolved. A family with a child in a pediatric wheelchair would be told that a facility that included a ramp, but with doors that were narrower than the criterion 32 inches was accessible, provided that the doors were wider than the 28 inches of the child’s chair. A person with low-vision would not be told that a facility were inaccessible because it did not provide Braille, provided it provided lighting above 400 lumens, if that were the lighting level the individual needed to read normal sized print.

## CONCLUSIONS

When designing or modifying buildings, architects, builders, and owners must have clear standards of design for accessibility. There must be rules that say:

do this, and you meet your legal obligation. The existing ADA-ABA guidelines meet this need, though with complex language.

However, existing criterion-based assessments are unnecessarily restrictive for user applications. Accessibility guides, using criterion-based assessments, provide guidance to the “typical” person with a disability. They do not, however, allow for individual variation. With modern data and communication systems, it is possible to create object-based assessment systems that can personalize accessibility reports to the needs of individual users.

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#### 404.2.4.1 Maneuvering Clearances at Manual Swinging Doors and Gates

Approach Direction	Type of Use Door or Gate Side	Minimum Maneuvering Clearance	
		Perpendicular to Doorway	Parallel to Doorway (beyond latch side unless noted)
From front	Pull	60 inches (1525 mm)	18 inches (455 mm)
From front	Push	48 inches (1220 mm)	0 inches (0 mm) <sup>1</sup>
From hinge side	Pull	60 inches (1525 mm)	36 inches (915 mm)
From hinge side	Pull	54 inches (1370 mm)	42 inches (1065 mm)
From hinge side	Push	42 inches (1065 mm) <sup>2</sup>	22 inches (560 mm) <sup>3</sup>
From latch side	Pull	48 inches (1220 mm) <sup>4</sup>	24 inches (610 mm)
From latch side	Push	42 inches (1065 mm) <sup>4</sup>	24 inches (610 mm)

1. Add 12 inches (305 mm) if closer and latch are provided.

2. Add 6 inches (150 mm) if closer and latch are provided.

3. Beyond hinge side.

4. Add 6 inches (150 mm) if closer is provided.