Local Design Guide for ACHD Facilities

Chapter 5

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Prepared by:

The Transpo Group

INTRODUCTION

Each day, nearly everyone in Ada County is a *pedestrian* for at least some part of every trip. Yet within the last 20-30 years pedestrian travel has received, at best, only secondary attention. A much grater emphasis has been placed on the planning and design of major streets and highways, the primary focus being, seemingly on mobility and access for the *automobile*.

Many American cities have undertaken significant efforts in revising their plans, policies and designs for more walkable communities, seeking greater balance for multi-modal use of the public streetscape. At present, the cities in Ada County and ACHD are all participating in the regional planning efforts – *Communities In Motion* and the *Blueprint for Good Growth*[1]. Together, these efforts will be defining better ways to plan for and develop land use/ transportation networks that provide greater opportunities and conditions for walking (and cycling). The regional planning efforts will not be completed and adopted until after year 2005. Meanwhile, ACHD must consider more immediate refinements to its pedestrian design standards to comply with the ADA.

Pedestrian travel demand and design issues are garnering the attention of many Ada County residents. A recent public opinion poll[2] was taken to identify priorities for ACHD capital spending. Given the full description of ACHD's current program, Ada County poll respondents indicated their desire for an 11-12% increase in funding for community improvement projects, mostly pedestrian-related. As the urban areas in Ada County continue to develop, the trend for greater attention to pedestrian access, safety and circulation will likely continue.

Areas of Ada County with good pedestrian system features

Neighborhoods with missing sidewalks

There are many opportunities to improve pedestrian conditions and in doing so, making Ada County communities more livable. The purpose of the ACHD Local Design Guide is to first define *walkability* and the benefits of a walkable community. The Local Design Guide highlights significant local design features relative to the ADA requirements based on the premise – accessible design is the foundation for all pedestrian design[3].

Not all of the specific details relating to aspects of good pedestrian design are cited here. For a comparison of ACHD's current standards with current and anticipated ADA rulings[4] see **Appendix D**. In addition, the ACHD Local Design Guide directly references ***Designing Sidewalks and Trails for Access***[5] for the full range of pedestrian design elements, rather than develop a fully independent and comprehensive guide. Detailed sidewalk, curb ramp, driveway crossing and trail design elements are provided in *Designing Sidewalks and Trails for Access*. The ACHD Local Design Guide summarizes only those elements of the pedestrian system crucial to current planning, design and construction of critical pedestrian facilities in Ada County.

Sidewalks in a sterile pedestrian environment

The intent of the Local Design Guide is to help make Ada County a place of walkable communities. Defining *walkability* and the benefits of a walkable community within a local context is important.

ACHD LOCAL DESIGN GUIDE

As part of the PBTP effort an examination of ACHD's current street, sidewalk and curb ramp design standards was conducted, including a comparison of ACHD's standards to the Americans With Disabilities Act Accessible Guidelines (ADAAG).[6] ACHD has already adopted the Idaho Standards for Public Works Construction (ISPWC)[7] and is administering these standards throughout Ada County. The ISPWC has several design standards for sidewalks, driveway crossings and curb ramps. While these standards are intended to provide mobility enhancements for pedestrians, some of them are ADA non-compliant.

A detailed discussion and evaluation of ACHD design standards and ADAAG compliance is provided in **Appendix D**. In further discussions with local jurisdictions and stakeholders as part of the Community Involvement effort, some critical design issues were highlighted. **Inadequate sidewalk widths** and **steep slopes** were noted, as were the **growing number of new meandering sidewalks** (with steep slopes) in developing neighborhoods. New **curb-side sidewalks with steep driveway crossings** are also being built along busy arterials.

ACHD has recently been administering two predominant designs for curb ramp and sidewalk construction. Along major arterials the design most often constructed is a single, diagonal ramp with curbside sidewalks. While these ramps can be constructed to ADA guidelines, a number of vision-impaired stakeholders and other participants in the Community Involvement effort indicated their concerns about diagonal ramps. Their primary concern is that the direction of travel is oriented by the diagonal ramp towards the center of the intersection rather than directly to the crosswalk. Placement of truncated domes (while not desired by some) only complicates the orientation. The combination of a single ramp and curbside sidewalks was also noted as a less desirable environment for pedestrians (of all kinds) crossing busy arterials.

In residential areas new sidewalks are more often separated from the street, and the prevailing designs being constructed as either a set of perpendicular curb ramps or a single diagonal ramp. Unfortunately, these ramps are often not equipped with a level top landing of sufficient width to comply with the ADA.

The ACHD *Local Design Guide* focuses on each of these issues with separate sections for *Sidewalk Corridors*, *Grade and Cross Slope*, *Driveway Crossings, Curb Ramps, Pedestrian Crossings* and *Other Design Features*.

For each element of the ACHD Local Design Guide a summary is provided, including:

- Americans with Disabilities Act Accessible Guidelines (ADAAG) regulations
- FHWA *Designing Sidewalks and Trails for Access – Best Practices Design Guide* (where applicable)
- ADAAG Draft Rule (regulations that may be added or amended in the near future)
- Current ACHD Design Standards
- Recommended refinements to ACHD Design Standards

SIDEWALK CORRIDOR

The *Sidewalk Corridor* is defined as that portion of the pedestrian system from the edge of the roadway (back of curb) to the edge of the right-of-way, generally along the sides of streets, between street corners. For the purpose of the ACHD Local Design Guide, the width of the sidewalk corridor extends to the edge of the street or roadway, even if part of that area is not paved. Sidewalk corridors that promote access include the following characteristics:

- Wide pathways;
- Clearly defined pedestrian, furniture, and frontage zones;
- Minimal obstacles;
- Minimal protruding objects;
- Minimal walking distance;
- Moderate grades and cross slopes;
- Rest areas outside of the pedestrian zone;
- Minimal changes in level;
- Firm, stable, and slip resistant surfaces; and
- Good lighting

In general, street lighting is usually not under ACHD's jurisdiction except at some signalized intersections. ACHD is also not the sole public agency responsible for the development and maintenance of these sidewalk corridor characteristics. Cities and redevelopment agencies also share in some jurisdictional responsibilities with ACHD.

Highlighted elements of the sidewalk corridor included in the Local Design Guide are sidewalk widths, grades and slopes. ACHD can directly reference *Designing Sidewalks and Trails for Access* as a design guide for other sidewalk corridor elements.

Width

The width of the sidewalk corridor is one of the most significant factors in determining the type of pedestrian experience that the sidewalk provides. In many locations, the sidewalk corridor is paved from the curb to the property line. In other areas, the paved portion of the sidewalk corridor is set back from the street by a surface, such as grass or some type of landscaping treatment, which is not intended for pedestrian travel. See **Table 5-1**.

Table 5-1 Sidewalk Width Regulations

ADAAG Regulations:

Clearances (Section 403.5) - *Clear Width* of walking surfaces shall be a minimum of 3 feet (36 inches), except as provided at *turns* and *passing spaces*.

Passing spaces - "An accessible route with a clear width less than 5 feet (60 inches) shall provide passing spaces at intervals of 200 feet maximum. Passing spaces shall be either: (a) a space 5 feet (60 inches) minimum by 5 feet (60 inches) minimum; or, (b) an intersection of two walking surfaces providing a t-shaped space where the base and arms of the t-shaped space extend **4 feet** (48 inches) minimum beyond the intersection.

FHWA *Designing Sidewalks and Trails for Access*:

Width - The pedestrian "zone" (sidewalk) should be at least 5 feet (60 inches) wide for two pedestrians to travel side by side without passing other pedestrians, or for two people going in opposite directions to pass one another.

The pedestrian zone should never be less than 3 feet (36 inches). This minimum width is only acceptable when: (1) A wider width is impossible; (2) The narrow width continues for as short a distance as possible; and, (3) Passing spaces are provided at intervals of no more than 200 feet.

ADAAG Draft Rule:

Clear Width - The minimum clear width of a pedestrian access route shall be **4 feet** (48 inches), exclusive of the width of the curb.

Current ACHD Standard:

The *Location Grade* and *Width* to be established or approved by the Owner (ACHD). Standards are absent of any language regarding specific width or clearance width.

Recommended Changes to ACHD Standard:

ACHD's standards should be modified to a minimum width of **5 feet**, wider in commercial and industrial areas as needed. The minimum sidewalk width can ensure a *clear width* minimum of 4 feet under most prevailing conditions.

Pedestrian, Furniture and Frontage Zones

As part of the Community Involvement effort several participants noted the absence of setback requirements and the impact to edge treatments along sidewalks. A prevailing problem was defined where private vegetation and fencing have been installed immediately behind sidewalks, which results in a more confined public walking space.

Many U.S. cities are adopting and implementing design standards for sidewalk corridor based on a zone system. ACHD may wish to consider revising their design standards and policies based on the zonal system, consistent with *Designing Sidewalks and Trails for Access,* and coordinating with local land use agencies for consistent application.

The zone system is used to determine the width of the sidewalk corridor and to ensure that

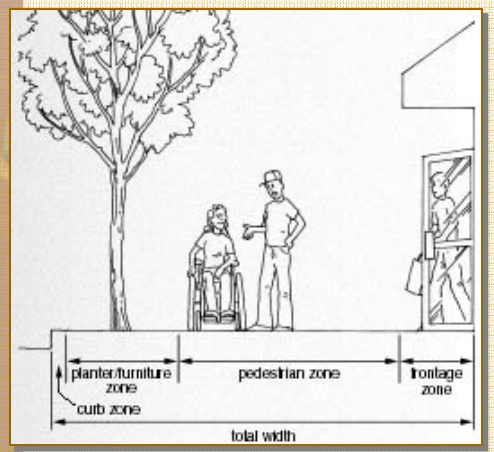


Fig. 5-1

The zone system divides the sidewalk corridor into four zones to help ensure that pedestrians have a sufficient amount of clear space to travel.

obstacles, such as newspaper boxes or utility poles, will not limit pedestrian access. As shown in **Figure 5-1**, the four zones within the sidewalk corridor are typically:

- Curb zone
- Planter/furniture zone
- Pedestrian zone
- Frontage zone

The width of the sidewalk corridor is then determined primarily by the width of the planter/furniture, pedestrian, and frontage zones. The size of the curb zone is generally constant throughout a community.

Taking into account the minimum width of each zone, at least 8 1/2 feet of right-of-way is allocated to the sidewalk corridor. However, additional space is often needed to accommodate items such as pedestrian crossings, on-street parking, street cafes, and high pedestrian volumes. **Table 5-2** contains recommendations for the minimum widths of each zone.

Because the definitions and variables for some zones can vary by land use, it is recommended that ACHD wait until the completion of *Communities In Motion* and *Blueprint for Good Growth* before implementing new policies that define a zone system for the sidewalk corridor. It is anticipated that *Communities In Motion* and *Blueprint for Good Growth* will address the larger issue of "livable" street designs and streetscape requirements that reflect the Ada County community needs. If not, ACHD will need to re-address their street and sidewalk design standards, directly, to address emerging public needs.

Sidewalk Grade and Cross Slopes

Grades and cross slopes are very difficult for some people with mobility impairments to negotiate because it is harder to travel across sloped surfaces than horizontal surfaces. People with mobility

Table 5-2 Sidewalk Corridor Zone

Zone	Minimum Width
Curb Zone	6 inches [1/2 foot]
Planter/Furniture Zone	24 inches [2 feet] [6 feet if planting trees]
Pedestrian Zone	60 inches [5 feet]
Frontage Zone	30 inches*
Total Sidewalk Corridor	10 feet*

**If at least 2 1/2 feet of open space is available between the sidewalk corridor and the property line, no frontage zone is needed and the minimum recommended width for the sidewalk corridor is 7 1/2*

impairments who are ambulatory or use manual wheelchairs (see **Figure 5-2**) must exert significantly more energy than other pedestrians to traverse sloped surfaces. Powered wheelchairs are affected by the additional work required on steep grades because more battery power is used. This reduces the travel range of a powered chair. Both powered and manual wheelchairs can become unstable and/or difficult to control on sloped surfaces. Whenever possible, slopes should not be artificially created and should be minimized to improve access for people with mobility impairments. See **Table 5-3**.

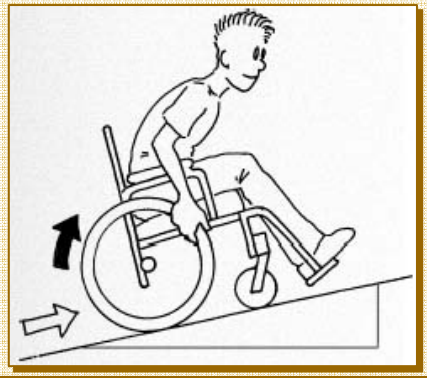


Fig. 5-2

Steep sidewalk grades are a significant barrier for many pedestrians.

Table 5-3 Sidewalk Grade Regulations

ADAAG Regulations:

Slope - The running slope of walking surfaces shall not be steeper than 1:20 (5%). The cross slope of walking surfaces shall not be steeper than 1:48 (roughly 2%).

ADAAG Draft Rule:

Cross Slope - The cross slope of the pedestrian access route shall be 1:48 maximum.

Grade - The grade of the pedestrian access route within a sidewalk shall not exceed the grade established for the adjacent roadway. (EXCEPTION: The running slope of a pedestrian access route shall be permitted to be steeper than the grade of the adjacent roadway, provided that the pedestrian access route is less than 1:20)

Current ACHD Standard:

The *Location Grade* and *Width* to be established or approved by the Owner (ACHD). Standards are absent of any language regarding specific grade requirements.

Recommended Changes to ACHD Standard:

ACHD's standards should be modified to specify consistent grade and cross slope as noted in ADAAG.

ACHD should also add a standard drawing for meandering sidewalks that stipulates minimum walkway width of 5 feet, maximum slope and cross-slope (per Sidewalk standards) and construction cross-section and materials. The standard should also minimize horizontal curves along minor and major arterials that create additional out-of-direction travel.

Some meandering sidewalks are constructed with unnecessary curves and grades

Meandering Sidewalks

Currently, ADAAG does not specifically address meandering sidewalks. However, in 1999 the U.S. Access Board drafted rules to guide design of meandering sidewalks. These rules may be adopted in the near future. The draft rule language includes:

On a new site, a knowledgeable designer can often manipulate cut and fill, entrance location, and approach direction and length to limit walkway running slope to 1:20 (5%), adding, where necessary, ramped segments with handrails and landings at or below the 1:12 (8.33%) slope specified in accessibility standards for ramps. These slopes will not be consistently possible to achieve along public sidewalks and shared-use paths, where running slope is tied to roadway gradient and underlying terrain. Nevertheless, running slope should be kept to the minimum feasible *consistent with these factors.* ***Artificial slopes should not be added as landscaping features, nor should meandering walkways that add significantly to the travel distance be permitted on a primary circulation route.***

DRIVEWAY CROSSINGS

Driveway crossings permit cars to cross the sidewalk and enter the street. They serve the same basic purpose for cars as curb ramps serve for pedestrians. Therefore, they consist of many of the same components found in curb ramps. It is the driver's responsibility to yield to the pedestrian at the driveway-sidewalk interface. Unfortunately, this does not always happen, and pedestrians are put at risk. Minimizing the number of driveway crossings in a sidewalk significantly improves pedestrian safety.

Driveway crossings should be designed so that both the pedestrians and the drivers are able to use them effectively. However, a driveway crossing must provide a way for cars to negotiate the elevation change between the street and the sidewalk. This is generally achieved by ramping all or a portion of the driveway crossing.

When the ramp for the motorist crosses the pedestrian's path of travel, significant cross slopes and changes in cross slope must be negotiated by the pedestrian.

Change in Cross Slope

A change in cross slope is an abrupt difference between the cross slope of two adjacent surfaces. ADAAG does not permit cross slope to exceed 2 percent (changes in cross slope are allowed between 0-2 percent only). Changes in cross slope are commonly found at driveway crossings without level crossings. When considering the needs of pedestrians, change in cross slope is evaluated over a 2-foot interval, which represents the approximate length of a single walking pace and the base of support of assistive devices, such as wheelchairs or walkers. The design recommendations for change of cross slope specify the relationship between two adjacent surfaces, not the actual cross slope of either surface. **Table 5-4** summarizes the ADAAG regulations regarding

Driveway crossings….

….without level landings…..

….. and with level landings

Table 5-4 Driveway Crossing Regulations

ADAAG Regulations:

Slope - The running slope of walking surfaces shall not be steeper than 1:20 (5%). The cross slope of walking surfaces shall not be steeper than 1:48 (roughly 2%).

Current ACHD Standard:

Driveway crossing standard notes states "Approach to conform to the latest ADA standards."

Driveway slope standard is 12:1 (8.33%), which also serves as the sidewalk surface for those crossings when walk is at back of curb (curbside sidewalk).

Walkway width is equal to Approach "depth" per Approach Dimension Table. For 3" curb height, walkway width standard is 4 feet.

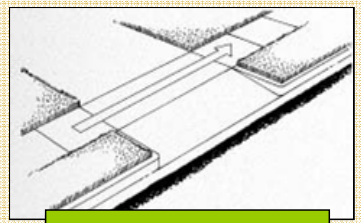
Recommended Changes to ACHD Standard:

Revise standard drawing to include accessible driveway crossing designs with maximum cross slope of 2% to meet ADA (ADAAG) standards.

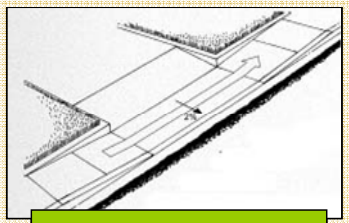
driveway crossings of sidewalks. Included in the table are recommended changes to ACHD's standards. **Figure 5-3** illustrates a number of driveway crossings, depicting those with and without level sidewalk landings.

Sidewalks with level landings are critical at driveway crossings

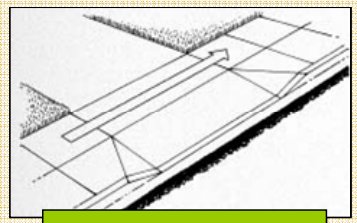
Fig. 5-3



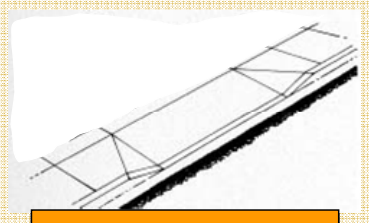
Level Landing w/ Return Curb



Level Crossing w/ Parallel Ramps



Level Landing w/ Jogged Sidewalk



Driveway Xing w/out Level Xing

CURB RAMPS

For pedestrians of all types, the curb ramp is the immediate junction between the sidewalk and street crosswalk. It is no surprise, then, that a great deal of attention is paid to the planning and design of curb ramps. In general, curb ramps are most commonly found at intersections, but they may also be located at bus stops and mid-block (street) crossings. The implementing regulations under Title II of the ADA specifically identify curb ramps as requirements for existing facilities, as well as all new construction. Curb ramps for existing facilities must be included in the PBTP.

Curb ramp design issues vary from city to city and from subdivision to subdivision. As part of the Community Involvement effort a number of local issues were raised regarding curb ramps in Ada County. This section provides some background information on curb ramps, user needs, and what can be done to meet ADA conformity by revisions to current curb ramp designs.

Mobility-Impaired Users

As noted by FHWA, curb ramps are designed to provide access to people who use wheeled forms of mobility. Without curb ramps, people who use wheelchairs would not be able to independently access the sidewalk and street.

Not all wheelchairs are similar in design and function, nor are all mobility-impaired pedestrians equally mobile. In fact, not all mobility-impaired pedestrians require a curb ramp. So, "a one-size fits all" curb ramp design is difficult to develop., as illustrated in **Figure 5-4.**

Vision-Impaired Users

For vision-impaired pedestrians, the curb is the most reliable cue to identify the transition between the sidewalk and the street. Most, if not all, curb ramps remove this cue. The physical ramp itself becomes more of a barrier to some vision-impaired walkers. Curb ramps are more difficult to detect by the range of vision-impaired. The combination of curb ramps and placement of truncated domes can, if done improperly, cause greater confusion to vision-impaired pedestrians seeking direction to cross busy streets.

With a single, diagonal curb ramp, wheelchair users cross in different location than other pedestrians.

With two perpendicular curb ramps, all users cross at the same location.

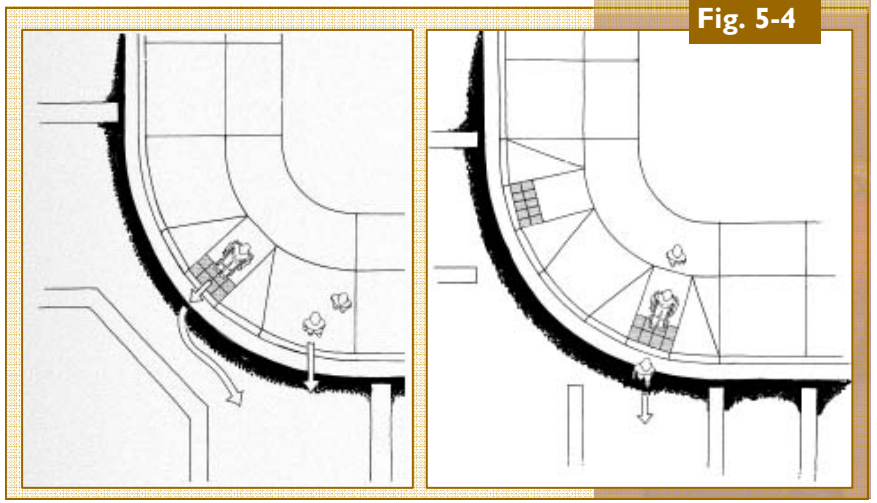


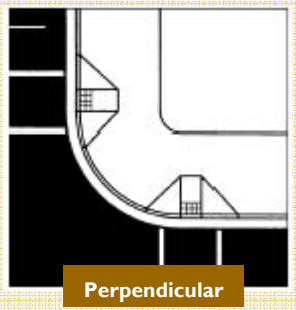
Fig. 5-4

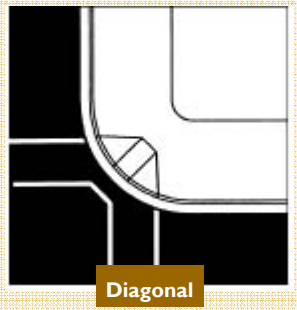
Curb Ramp Types and Components

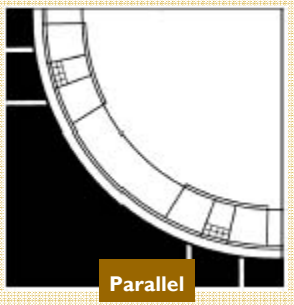
Fig. 5-5

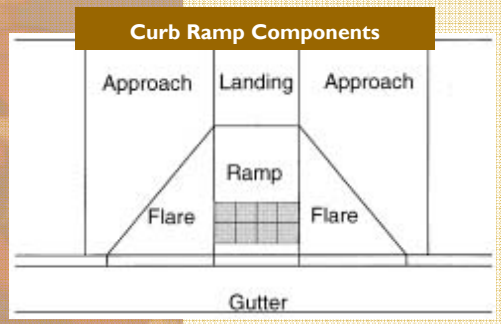
Ideal Design Characteristics

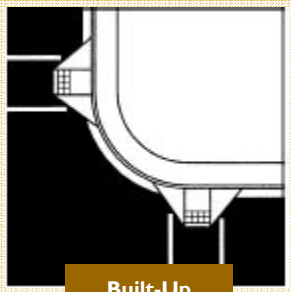
FHWA's *Designing Sidewalks and Trails for Access* identifies a number of curb ramp designs that make the best accessible connection between the sidewalk and the street – for the full range of pedestrian users. To maximize accessibility and safety for all pedestrians, particularly when retrofitting existing curb ramps, curb ramp designs should attempt to meet all of the best practices for curb ramp design shown in **Table 5-5.** Depending on site constraints, it may not be possible to incorporate all of the best practices within each curb ramp.

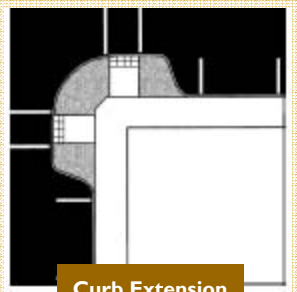












Curb Ramp Types

Curb ramps are usually categorized by their structural design and how it is positioned relative to the sidewalk or street. The structure of a curb ramp is determined by how the components, such as ramps and flares, are assembled. The type of curb ramp and the installation site will determine its accessibility and safety for pedestrians with and without disabilities. As shown in **Figure 5-5**, the following types of curb ramps are most typical:

- Perpendicular curb ramps
- Diagonal curb ramps
- Parallel curb ramps
- Combination curb ramps
- Built-up curb ramps
- Curb extension

ACHD has invested considerable effort and resources in assisting in the development and application of curb ramp designs already contained in the ISPWC. The ISPWC provides a good variety of curb ramp design standards, and

there are many good characteristics incorporated in each. However, there are a number of areas in the ISPWC curb ramp design standards that should be revised for ADA compliance. ACHD can either modify its own standards or work with various Idaho agencies to modify the ISPWC standards.

ADAAG has specifically addressed minimum standards for curb ramp components. In some cases FHWA has provided greater detail on recommended curb ramp designs, as summarized in **Table 5-5.** Where there are differences between ADAAG and FHWA's *Designing Sidewalks and Trails for Access,* it is recommended that ACHD follow the FHWA guidelines for ADA compliance.

For most all of the various curb ramp types, ACHD should revise its curb ramp standards consistent with FHWA's *Designing Sidewalks and Trails for Access* to address each of the following components:

Table 5-5 Curb Ramp Design Best Practices

Best Practice	Rationale
Provide a level maneuvering area or landing at the top of the curb ramp.	Landings are critical to allow wheelchair users space to maneuver on or off of the ramp. Furthermore, people who are continuing along the sidewalk will not have to negotiate a surface with a changing grade or cross slope.
Clearly identify the boundary between the bottom of the curb ramp and the street with a detectable warning.	Without a detectable warning, people with vision impairments may not be able to identify the boundary between the sidewalk and the street.
Design ramp grades that are perpendicular to the curb.	Assistive devices for mobility are unstable if one side of the device is lower than the other or if the full base of support (e.g., all four wheels on a wheelchair) are not in contact with the surface. This commonly occurs when the bottom of a curb ramp is not perpendicular to the curb.
Place the curb ramp within the marked crosswalk area.	Pedestrians outside of the marked crosswalk are less likely to be seen by drivers because they are not in an expected location.
Avoid changes of grade that exceed 11 percent over a 610 mm (24 in) interval.	Severe or sudden grade changes may not provide sufficient clearance for the frame of the wheelchair causing the user to tip forward or backward.
Design the ramp that doesn't require turning or maneuvering on the ramp surface.	Maneuvering on a steep grade can be very hazardous for people with mobility impairments.
Provide a curb ramp grade that can be easily distinguished from surrounding terrain; otherwise, use detectable warnings.	Gradual slopes make it difficult for people with vision impairments to detect the presence of a curb ramp.
Design the ramp with a grade of 7.1 ± 1.2 percent. [Do not exceed 8.33 percent (1:12).]	Shallow grades are difficult for people with vision impairments to detect but steep grades are difficult for those using assistive devices for mobility.
Design the ramp and gutter with a cross slope of 2.0 percent.	Ramps should have minimal cross slope so users do not have to negotiate a steep grade and cross slope simultaneously.
Provide adequate drainage to prevent the accumulation of water or debris on or at the bottom of the ramp.	Water, ice, or debris accumulation will decrease the slip resistance of the curb ramp surface.
Transitions from ramps to gutter and streets should be flush and free of level changes.	Maneuvering over any vertical rise such as lips and defects can cause wheelchair users to propel forward when wheels hit this barrier.
Align the curb ramp with the crosswalk, so there is a straight path of travel from the top of the ramp to the center of the roadway to the curb ramp on the other side.	Where curb ramps can be ahead, people using wheelchairs often build up momentum in the crosswalk in order to get up the curb ramp grade (i.e., they "take a run at it"). This alignment may be useful for people with vision impairments.
Provide clearly defined and easily identified edges or transitions on both sides of the ramp to contrast with sidewalk.	Clearly defined edges assist users with vision impairments to identify the presence of the ramp when it is approached from the side.

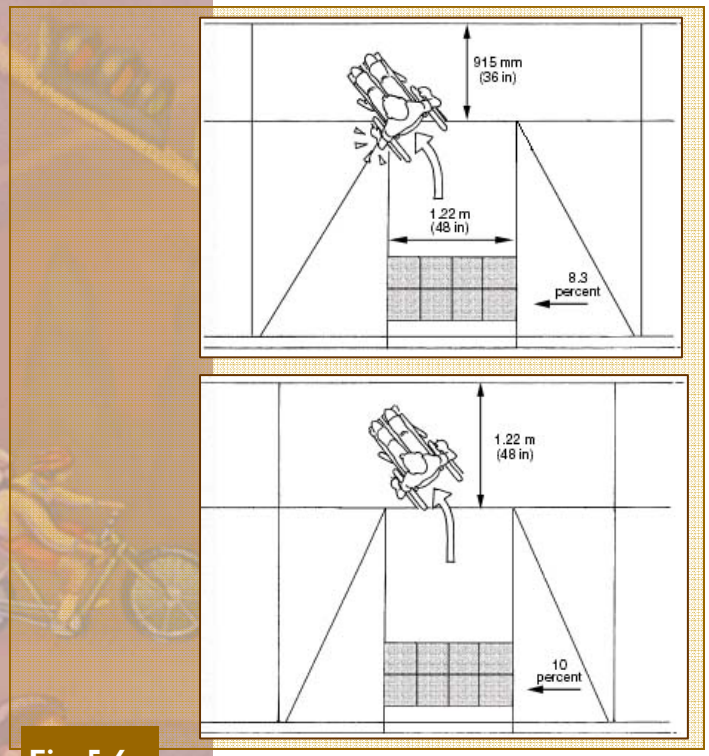


Fig. 5-6

Curb Ramp Landings are critical

Curb Ramp Grade – ADAAG permits curb ramp slopes of 8.33% for new construction. FHWA recommends 7.1% to allow for construction tolerances. For retrofits where 8.3% ramp slopes cannot be attained, FHWA specifies the following ADAAG (1991) exceptions (not to be used for new construction):

- A slope between 8.33% and 10% is permitted for a maximum rise of 6 inches.
- A slope between 10% and 12.5% is permitted for a maximum rise of 3 inches.

A slope steeper than 12.5% should be avoided regardless of length of ramp.

Ramp Cross Slope – Ramp cross slopes should not exceed 2.0%.

Ramp Length – See FHWA *Designing Sidewalks and Trails for Access*, (Table 7-3).

Ramp Width – Recommended width is 4 feet (48 inches), but should never be less than 3 feet (36 inches).

Gutter Slope – Drainage slopes should not exceed 2%. On most curb ramps, to avoid rapidly changing grades, the cross slope of the street and gutter approach should not exceed 5%.

Change of Grade – Transition areas should have a minimum grade change (less than 11%) for a gradual transition for wheelchair users.

Sidewalk Approach Width – Sidewalk approaches should have a minimum, 3-foot (36-inch) clear space, free of obstacles.

Landing Dimension and Slope – Slopes of a landing should not exceed 2%. As shown in **Figure 5-6,** landings should extend at least 4 feet (48 inches) beyond the top of the curb ramp for maneuverability. If the space is limited and a 4-foot landing cannot be provided, an absolute minimum, 3-foot (36-inch) landing is acceptable, coupled with a minimum ramp width of 4 feet (48 inches) and ramp flare slopes not to exceed 8.3%.

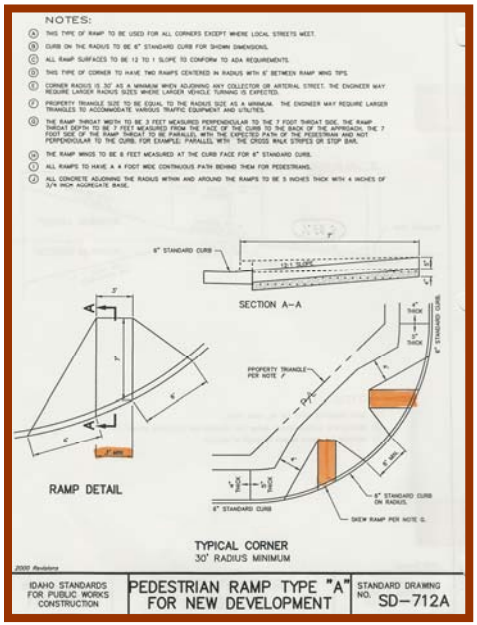
One of the most significant issues raised in the Community Involvement effort is the prevailing design and construction of diagonal curb ramps at major arterial intersections, combined with curb-side sidewalks. The ISPWC and ACHD standards generally offer two different curb ramp designs on arterial streets:

(1) a single-ramp design which directs the traveler to the intersection center and requires a bottom landing where the crosswalks intersect; or,

(2) a double-ramp design, which orients the user to the crosswalk, but at an angle to the curb.

As shown in **Figure 5-7**, however, the sidewalks are generally designed for curbside connections to the curb ramp approaches and top landing.

Figure 5-7 Current ISPWC Curb Ramp Standards



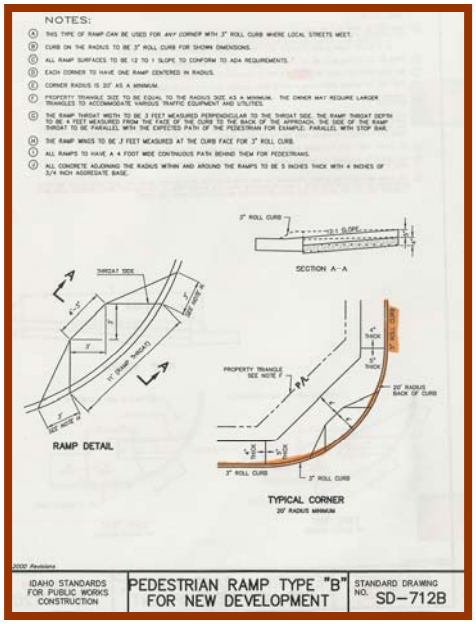


Figure 5-8 illustrates an ADA-compliant, diagonal curb ramp. Such a design requires a top level landing with sufficient width (four feet is recommended).

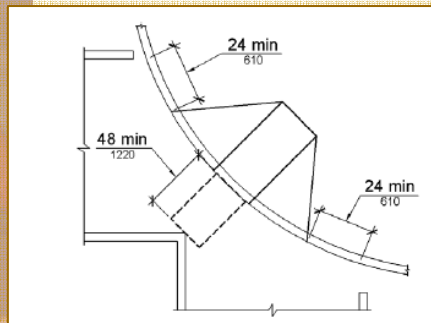
The relationship between curb ramps and street design is discussed further in the following section — *Pedestrian Crossings*.

ADA-compliant Diagonal Curb Ramp

Fig. 5-8

PEDESTRIAN CROSSINGS

In *Designing Sidewalks and Trials for Access,* FHWA fully defines pedestrian crossings as *any location where the pedestrian leaves the sidewalk and enters the roadway*. At a pedestrian crossing, the pedestrian's path of travel crosses the motorist's path of travel. Pedestrian crossings include (a) mid-block crossings and (b) street intersections. At mid-block crossings, pedestrians generally encounter traffic moving in two directions. At street intersections, particularly those controlled with traffic signals, traffic is usually moving in multiple directions because of turning vehicles.



A considerable portion of *Designing Sidewalks and Trials for Access* is summarized here regarding pedestrian crossings at street intersections, because it gets at the crux of one of ACHD's emerging issues: *how to design arterial street intersections to balance the needs of drivers and pedestrians*.

Possible Design Solutions at Wide Intersections

ACHD can apply a number of techniques to improve pedestrian conditions and access at wide intersections where appropriate right-of-way exists, including:

- Install center medians to provide a refuge for slower pedestrians;
- Install accessible pedestrian signals to assist in providing people with vision impairments enough time to cross the street;
- Increase crossing times so that people who walk slowly will have sufficient time to cross before the signal indication changes;
- Increase the crossing times so that people who delay the start of their crossing to confirm the WALK interval will have sufficient time to cross before the signal indication changes;
- Restrict right turns on red;
- Enhance the visibility of the crosswalk markings or consider a raised crosswalk with detectable warnings (truncated domes) at both ends;
- Reduce crossing distances and increase visibility through the construction of curb extensions;
- Reduce traffic speed;
- Clarify the pedestrian crossing area by installing stamped or raised crosswalks with detectable warnings (truncated domes) installed at both ends;
- Provide pedestrian lead time and an accessible pedestrian signal so pedestrians, including those with vision impairments, can assert themselves in the

crosswalk before motorists start making right and left turns;

- Provide mid-block signalized crossing with accessible pedestrian signal opportunities at busy intersections to encourage people to cross where there are fewer potential points of conflict between pedestrians and motorists;
- Provide a curb extension to decrease crossing distances and increase pedestrian visibility; and
- Add traffic and pedestrian signal indications if they do not already exist..

Turning Radius

Designing intersections with smaller turning radii slows traffic speeds and allows perpendicular curb ramps to be positioned parallel to the crosswalk path of travel, as well as perpendicular to the curb. In addition, smaller turning radii significantly decrease crossing distances for pedestrians. Smaller radii also enhance detection of the crosswalk and improve crossing conditions for people with vision impairments because there is a greater distinction between the perpendicular and parallel traffic flows.

ACHD's current street and sidewalk design standards, which are reflected at many major intersections in the developing portions of Ada County, include larger turning radii at intersections *in order to accommodate larger vehicles and more continuous traffic flow*. ACHD has essentially deployed roadway design standards much like other U.S. cities in the past. With respect to turning radii, ACHD's designs have been determined *by the types of vehicles that travel on the road and the intended speeds for drivers to make right turns*. Who benefits from these designs? Larger trucks, buses, and passenger vehicles all benefit.

Pedestrian access, however, is significantly compromised at intersections with larger turning radii, for the following reasons:

- Cars can make right turns at higher speeds;
- Curb ramp designs are often compromised;
- Pedestrian crossing distances are increased (this also results in increased vehicle signal phasing delays and reduced roadway capacity from the delays);
- Less space is available on the corner for pedestrians to collect;
- Less space is available on the corner for utilities;
- It is more difficult for pedestrians, especially those with vision impairments, to claim the right of way when crossing;
- Greater numbers of conflicts arise between pedestrians and motorists; and
- Pedestrians are located outside of a driver's line of vision.

Appropriate driver sight lines at street intersections are important for pedestrian safety. Street design and surrounding land use patterns

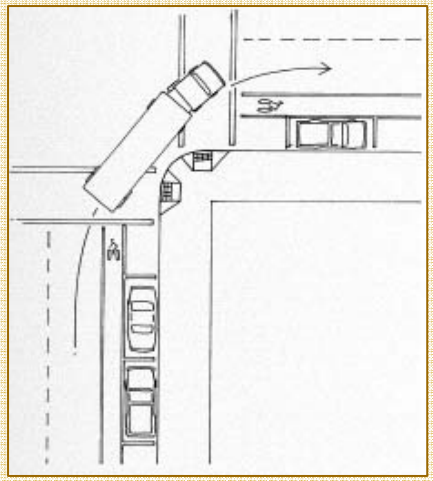
Adding bike lanes and parking lanes increases the potential turning radius for trucks, while maintaining the benefits of smaller turning radii for pedestrians

vary significantly within Ada County and can greatly affect the prevailing sight lines.

Intersection Design Issues for Further Consideration

The design speed of arterial streets greatly affects the design requirements of intersection corner radii. ACHD's current standards are essentially oriented to auto and truck mobility. These designs also affect the type of sidewalk approaches and curb ramps to accommodate intersecting pedestrians. As illustrated in **Figure 5-9**, by reducing the intersection corner radii for some arterials (arterial design speed), ACHD may better accommodate pedestrians of all types by including sidewalk buffers and approaches at corners, and perpendicular curb ramps rather than diagonal curb ramps.

Fig. 5-9



Options such as these will likely require more right of way. The decisions to make significant changes to arterial street, intersection, sidewalk and curb ramp design standards really ought to reflect emerging community values and plans. Again, it is anticipated that the *Communities In Motion* and *Blueprint for Good Growth* will help these community values, and develop community-based "livable" street guidelines and designs, particularly for arterial streets. These guidelines and designs will likely affect the type of curb ramp and sidewalk facility best applied at major arterial intersections to accommodate all pedestrians, especially the mobility-impaired.

OTHER DESIGN FEATURES

ACHD should be proactive in the research and application of other design features that assist pedestrians. Major design features included in the Local Design Guide are truncated domes as detectable warnings, and audible signals to assist blind walkers at major, signalized street intersections—particularly those with complex crossings and configuration.

Detectable Warnings – Truncated Domes[8]

Detectable warnings are an ADA requirement in the current ADAAG for use by the vision-impaired to detect the boundary between the sidewalk and the street. Examples of detectable warnings are illustrated in **Figure 5-10**. The original requirement in ADAAG was suspended for a time to conduct further research. Research was conducted and the suspension

of the requirement was lifted on July 26, 2001. At the time FHWA's *Designing Sidewalks and Trails for Access* went to print, the suspension had not been lifted, so its text did not mention that detectable warnings are required.

Detectable warnings are now required when constructing and altering curb ramps. Truncated domes are the only detectable warnings allowed by ADAAG. ACHD has already initiated the important testing and installation of truncated dome applications for current ADA compliance in the local area. ACHD is developing findings for a preferred application of truncated domes using pre-cast dome tiles that are placed in the fresh cement applied with their standard curbing/sidewalk equipment.

On existing curb ramps that currently lack truncated domes, ACHD is experimenting with various commercial, dome adhesive products that can be placed directly on the existing curb ramp surface. At the completion of its evaluation ACHD will likely be preparing design standards for the placement of truncated domes as part of all new ADA-compliant curb ramps.

Audible Signals

Pedestrian signal indications are special types of traffic signals that are used to control pedestrian traffic patterns and movements. They consist of a series of signals to indicate:

- WALK interval - the interval designated for pedestrians to cross;
- Clearance interval - the interval designated for pedestrians who are already crossing to complete their crossing. Pedestrians at corners should not start a new crossing; and
- DON'T WALK interval - the interval when pedestrians are not permitted to cross.

At many signalized intersections, the vision-impaired pedestrian relies on sounds of nearby, parallel traffic to indicate when the traffic signal WALK interval is indicated. At low volume intersections this method can be unreliable. Unreliable auditory cues, proportionately higher turn–volumes and complex pedestrian crossings can, by themselves or all together, cause the vision-impaired pedestrian to misjudge the signal WALK interval, leading to potentially unsafe conditions.

At wide intersections, pedestrian access can be enhanced through a variety of features including ladder marking of crosswalks, perpendicular curb ramps, curb extensions with landscaping, detectable warnings, medians and accessible pedestrian signals

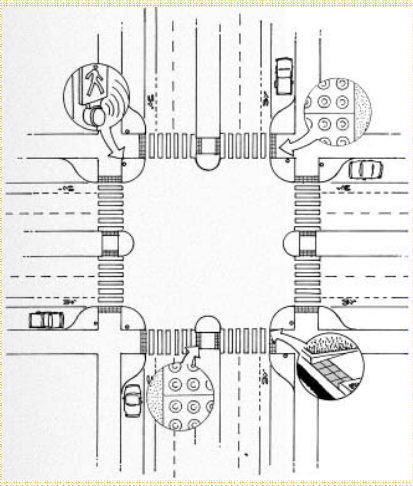
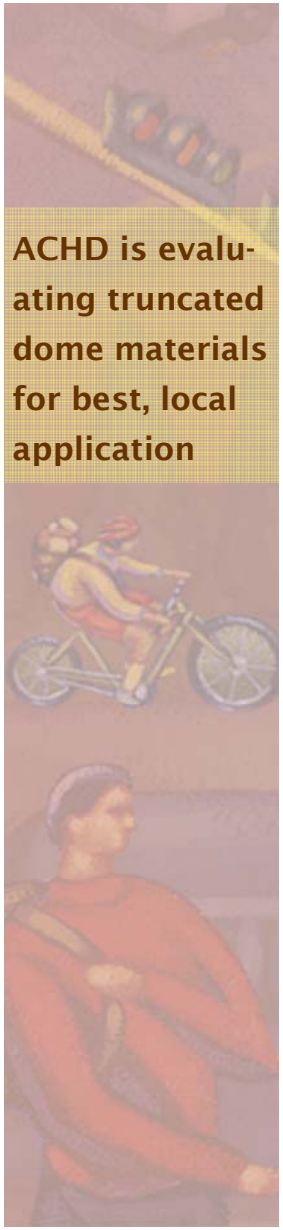


Fig. 5-10



ACHD is evaluating truncated dome materials for best, local application

The implementing regulation under Title II of the Americans with Disabilities Act requires that all facilities constructed or altered after January 26, 1992 be designed and constructed to be accessible to people with disabilities (U.S. Department of Justice, 1991a). Therefore, all newly installed pedestrian signals should have accessible design features. The Transportation Equity Act for the 21st Century (TEA-21) further supports the installation of accessible pedestrian signals by stipulating that the installation of audible signals and signs be included in new transportation plans and projects, where necessary, for safety (TEA-21, 1998).

In addition to including accessible pedestrian signals in all new construction, it is also recommended that existing signal devices that are not accessible be prioritized for replacement. The priorities for determining where existing pedestrian signals should be improved include:

- Complex or irregularly shaped intersections;
- Intersections experiencing high volumes of turning traffic;
- Signalized intersections where traffic sounds are sporadic or masked by ambient noise;
- Intersections that have vehicular actuation of the traffic signals;
- Intersections with complex signal phasing;
- Major corridors leading to areas of fundamental importance such as post offices, courthouses, and hospitals;
- Exclusive pedestrian phase areas, such as motorists stopped in all directions; and
- Locations requested by people with vision impairments.

However, there has been considerable discussion and disagreement over the use of audible pedestrian signals by the two main consumer groups, both nationally and locally in Ada County:

- American Council of the Blind (ACB) supported use of audible pedestrian signals; and,
- National Federation of the Blind (NFB) opposed all use of them.

Other Pedestrian Information Techniques

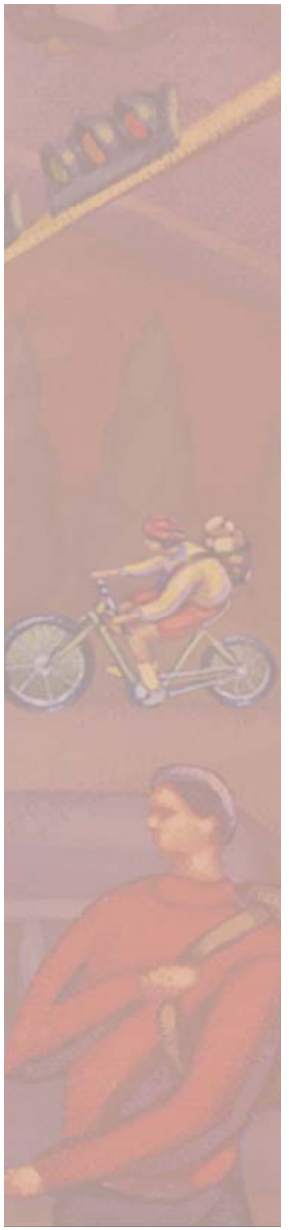
In addition to truncated domes and audible signals there are several pedestrian information techniques ACHD can provide for the mobility- and vision-impaired. These include:

- vibro-tactile signal devises,
- intersection (crosswalk) guide strips,

- wayfinding directional tiles, and
- informational signing.

As part of the Community Involvement effort ACHD received some comment from the vision-impaired community regarding audible signals. ACHD should coordinate with the vision-impaired community (see Implementation Plan), consider on-going research[9] of audible signal design and implementation and other pedestrian information techniques.

ACHD should then establish priorities consistent with *Designing Sidewalks and Trails for Access*, and prepare specific project plans for the installation of pedestrian information and audible signals at critical locations in Ada County, *with the support of both the ACB and NFB local chapters*. ACHD should then revise its traffic signal designs to accommodate the necessary audible signal equipment and application as part of new traffic signal construction.



Making better design decisions for walkable spaces

DEFINING *WALKABILITY* IN ADA COUNTY

Ultimately, the implementation of the ACHD Local Design Guide needs to meet the requirements of ADA. However, to develop a comprehensive system, some concept of "walkability" should be defined.

Certainly each local community considers their own unique definition of walkability. The current regional planning effort to study the land use/transportation connection throughout Ada County should help define walkability in a meaningful, local way – not by ACHD only, but in coordination with all local jurisdictions. Until then, there are other sources to draw from. A national project called *Campaign to Make America Walkable*[6] developed the following statements as a comprehensive *vision* of what constitutes a walkable community. This vision can be applied to Ada County and may vary within jurisdictional boundaries:

People of all ages and abilities have easy access to their community "on foot"-an automobile is not needed for every trip.

People walk more and the community and neighborhoods are safer, healthier, and friendlier places.

Parents feel comfortable about their children being outside in their neighborhoods; they don't worry about the threat of motor vehicles.

Children spend more time outside with other children and are more active, physically fit, and healthy.

Streets and highways are designed or reconstructed to provide safe and comfortable facilities for pedestrians, and are safe and easy to cross for people of all ages and abilities.

Pedestrians are given priority in neighborhood, work, school, and shopping areas. Motor vehicle speeds are reduced (and, in some places, motor vehicles have been eliminated entirely) to ensure compatibility with pedestrian traffic.

Motor vehicle operating speeds are carefully controlled to ensure compatibility with adjacent land uses and the routine presence of pedestrians.

Drivers of motor vehicles operate them in a prudent, responsible fashion, knowing that they will be held strictly accountable for any threat, injury, or death caused by their lack of due care or violation of the vehicle code.

CHARACTERISTICS OF A WALKABALE COMMUNITY

COMPASS, ACHD, Idaho Transportation Department (ITD) the cities and Ada County are all working together as part of the *Communities In Motion* and *Blueprint for Good Growth* effort to help define the region's future transportation/ land use vision and plan. The importance of walkability and what defines walkability at the local level may be a common theme and product of the regional planning effort. In the interim, the ACHD Local Design Guide can draw from the following characteristics to define a *walkable* community:

- ***Coherence.*** A clear, understandable and organized sidewalk, street and land-use system consistent with the scale and function of the surrounding urban context. The sidewalk and street system should link points of interest and activity, provide clean lines of sight and travel, and include simple instructive signage.
- ***Continuity.*** A pattern of design and usage that unifies the pedestrian system.
- ***Equilibrium.*** A balance among transportation modes that will accommodate and encourage pedestrian participation.
- ***Safety.*** Pedestrian protection from automobiles and bicycles. Adequate time to cross intersections without interference. Physical separation from fast moving cars. Signalization protection when crossing intersections.
- ***Comfort***. Secure and negotiable paving materials for sidewalks and crosswalks. Unobstructed passage on the sidewalk and at corners. Signals timed to enable safe and quick crossings. Eliminate the introduction of artificial slopes.
- ***Sociability***. A sense of hospitality and suitability for individual and community interactions. Sidewalks should provide for a variety of uses and activities characteristic of the diverse urban scene.
- ***Accessibility.*** The opportunity for all individuals to utilize the pedestrian environment as fully as possible.
- ***Efficiency.*** Simplicity and cost-effectiveness in design and function. Minimum delay along a walking route.
- ***Attractiveness***. Clean, efficient and well-maintained surroundings, with adjacent storefronts and activities that provide sidewalk interest.

Designs that can discourage full mobility and access

What are the Benefits of Walkable Communities?

Some Ada County residents can already attest to the many benefits of walkable neighborhoods in portions of old and new Ada County.

Multi-Modal Choices

More people are indicating that they believe transportation is about more than roads, and that public transportation funds should be spent on improvements that benefit the broader spectrum of travelers, not just commuters. Many in Ada County share these values, as was recently discovered through public opinion research.

People- and Family- Oriented Community Development

As is the trend nation-wide, more new home buyers in Ada County are looking for neighborhoods that are family-friendly. Sometimes referred to as "neo-traditional," these neighborhoods include sidewalks and trails with streetscape amenities that calm traffic. Residents are more often considering walkability as a critical component in their land use decisions. Parents often consider "good" schools as an important factor when buying a new home. How their children get to and from school is part of the qualification. Also, a growing number of retirees are also looking for more walkable places and spaces in which to live, and more options for travel.

Independent Mobility for Children

Many parents and others are looking for opportunities that allow children to lead more active and independent lives, but the current transportation and land use system has left a series of barriers and obstacles that can make independent mobility for children a challenge. Parents want their children to be safe-in and around their neighborhoods, schools and recreation areas. But most suburban neighborhoods built over the past 50 years are today overrun with fast motor vehicle traffic, and some periods of development have lacked sidewalk installation in residential neighborhoods and along arterial routes.

Accessibility for All Users

As noted earlier, the ADA seeks to assure that all Americans-including those with disabilities-will have full access to public facilities and services. Good accommodations for pedestrians, including disabled pedestrians-people using wheelchairs and other mobility aids, people with low vision and the blind-is critical to meeting the requirements of ADA.

Further, national statistics indicate that people in low-income households are nearly twice as likely to walk as people in other income groups. Why? Many low-income households own only one car, or sometimes none at all. With more multi-worker households this means that a greater portion of individuals in low-income households must rely on walking and transit for many of their trips. For these travelers, safe and convenient walking routes, including routes to transit hubs and stops, are a critical element of the transportation system.

Elderly pedestrians generally require more time to cross streets and are less able to travel steeper terrain. Appropriate design considerations for the mobility-impaired also provide direct benefit to elderly pedestrians.

More Active and Healthier People

It is generally acknowledged by most that Americans are not getting enough exercise. Both the U.S. Surgeon General and American Heart Association agree that (1) Americans are not getting enough exercise and (2) our physical inactivity (especially for adults) is one of (fourth) the top major risk factors associated with chronic disease. America's youth is also in trouble: almost half of all children don't get enough exercise and nearly one-fourth engage in no form of real physical activity. And the trends are growing worse. As a whole, public health officials are working to encourage Americans to become more active, with a focused effort at promoting *walking*. Walking is inexpensive, it can be done by almost everyone, and-if conditions are right-it can be done almost everywhere.

The Boise area applauds itself for its access to a variety of outdoor recreational facilities. Opportunities for bicycling and walking are numerous and have been well-developed, especially the Ridge-to-Rivers recreational trail system. Within and between neighborhoods in the urban areas, however, there are many challenges ahead.

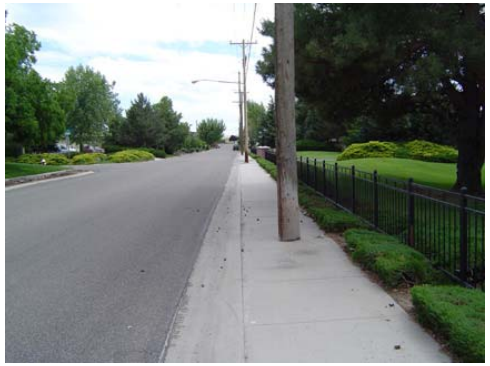
Fitting pedestrian system enhancements in a constrained environment

The Challenges to Making Ada County Communities More Walkable

Like the national trends, a growing number of Ada County residents are seeking more walkable environments. Until recently, the planning and design for pedestrian-focused features has been more secondary to streets and highways.

Removing obstacles to pedestrian access and mobility can be a challenge

Where the sidewalk ends



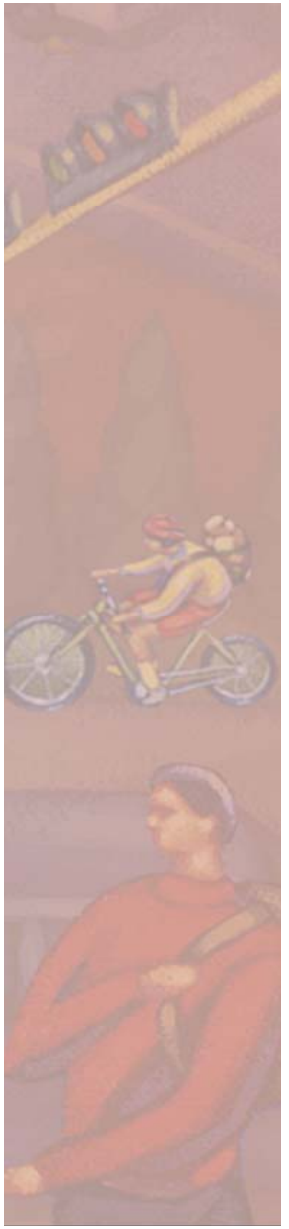
Certainly since the 1940's, older street and sidewalk design standards and land use development policies have not fully emphasized pedestrian mobility and access. Federal, state and local policies and standards de-emphasized the pedestrian to a great degree between the 1940's and 1980's. During that time, but also while meeting the prevailing federal design standards, ACHD, the cities, County and others have developed transportation facilities and land use patterns that created obstacles to the full range pedestrian travel, including:

- Lack of sidewalks
- Narrow walkway widths
- Missing curb cuts
- Poorly constructed and/or maintained walking surfaces
- Difficult street crossings (e.g., too wide, too fast)
- Inadequate bridge design (e.g., no other place to walk except travel lane)
- Physical features (e.g., rivers, irrigation systems, railroad tracks, major arterial streets lacking pedestrian crossings)
- Inadequate facilities for access to transit services
- High-speed, high volume traffic adjacent to schools, parks, shopping, and residential areas
- Sidewalks constructed on artificial berms that restrict mobility
- Meandering sidewalks that limit the functionality of the walking environment

ACHD's efforts to address the ADA, and with it the issues of greater mobility and access for all pedestrians, is an opportunity for self-correction to better meet current design trends and community expectations. As recommended in previous sections of the PBTP, ACHD will accomplish this by building new sidewalks and curb ramps in order of priority as funding is available.

SUMMARY

ACHD will need to evaluate and consider a number of their design standards and policies with respect to the full range of pedestrian travel needs. The ACHD Local Design Guide identifies the sidewalk, curb ramp and driveway crossing standards that should be amended to best comply with the ADA. Other policies and standards should be re-evaluated so ACHD can better provide a balance of transportation facilities to best meet the multi-modal needs and expectations of Ada County residents. FHWA's *Designing Sidewalks and Trails for Access* is an excellent, comprehensive resource for ACHD's use as it evaluates its broader design standards and policies with respect to pedestrian access



END NOTES:

[1] *Framework for Developing a Countywide Land Use and Transportation Blueprint for Good Growth*, Freilich, Leitner & Carlisle, 2005 work-in-progress.

[2] *Public Opinion on Priorities for ACHD Capital Spending*, Strategic Alliance, May 12, 2004.

[3] *Pedestrian Facilities Users Guide – Providing Safety and Mobility*, Federal Highway Administration, March, 2002.

[4] In 2005 the U.S. Access Board is expecting to finalize and publish *Guidelines* for *Accessible Rights of Way* based on over 1400 comments received following the Draft Rule review. To date, the U.S. Access Board is not certain what sections of the Draft Rule will be revised.

[5] *Designing Sidewalks and Trails for Access; Part II – Best Practices Design Guide, U.S. Department of Transportation, 2002; and, Developing Curb Ramp Design Based on Curb Radius*. Edward R. Stollof. Institute of Transportation Engineers Journal, April 2005.

[6] *Americans With Disabilities Act Accessibility Guidelines*, U.S. Access Board, 2002.

[7] *Idaho Standards for Public Works Construction*, 2003 Edition.

[8] See *FHWA Memorandum, July 30, 2004*. "The US Access Board, the federal agency responsible for developing accessibility guidelines under the Americans with Disabilities Act (ADA), published the ADA/ABA Accessibility Guidelines (ADA/ABA-AG) on July 23, 2004. The Access Board is charged with developing minimum guidelines to assist the Department of Transportation (DOT) and Department of Justice (DOJ) in establishing design standards. Although the publication of these guidelines marks the completion of the Access Board's responsibilities, these guidelines will not become ADA standards until the Departments of Justice and Transportation go through standard notice-and-comment rulemaking to adopt the new guidelines into the standards they maintain under the ADA, a process which is expected to take one to two years. In the interim, agencies must continue to use current ADA standards -- including those for detectable warnings at curb ramps and blended transitions -- when building new and altering pedestrian facilities. Therefore, there have been no changes to the existing requirements (since July 26, 2001) that detectable warnings must be applied to curb ramps in new construction and alterations.

As part of updating the guidelines, the Access Board is also developing more specific guidelines for public rights-of-way. On June 17, 2002 the Board released a draft of these guidelines for public comment in advance of publishing a proposed rule. Included are provisions for sidewalks, curb ramps, street crossings and related pedestrian facilities that are not addressed in the newly published ADA/ABA-AG. Both FHWA and the Access Board encourage use of the June 17, 2002 draft's scoping and technical provisions for detectable warnings as an equivalent facilitation to the current requirements in the 1991 (current) ADAAG.

USDOT is an implementing agency for the title II of the Americans with Disabilities Act and for section 504 of the Rehabilitation Act; the FHWA is the USDOT agency responsible for overseeing Title II and 504 compliance for pedestrian access in public rights-of-ways. USDOT is evaluating the ADA/ABA-AG and considering possible changes to USDOT section 504 regulations to reflect current detectable warning requirements until such time as the new public rights-of-way guidelines can be issued. The FHWA MUTCD staff are also pursuing inclusion of detectable warnings in Chapter 3 Markings. NCHRP and FHWA research is also underway to improve truncated dome maintenance and contrast."

[9] See (a) *Manual of Uniform Traffic Control Devices*, U.S. Department of Transportation, Federal Highway Administration, 2004;
(b) *Signalized Intersections: Information Guide*, FHWA, August 2004;
(c) *Accessible Pedestrian Signals: Synthesis and Guide to Best Practice.* National Cooperation Highway Research Program (NCHRP), Research Results Digest, July 2003, Number 278; and,
(d) on-going NCHRP research grant 3-62.

[10] *Creating Walkable Communities – A Guide for Local Governments*/Mid-American Regional Council, Kansas City, MO. Bicycle Federation of America Campaign to Make America Walkable. December 1998.