2 Who is a pedestrian?
Pedestrian travel in Wisconsin

2.1. Who is a Pedestrian?

Wisconsin State statute 340.01(43) defines a pedestrian as "…any person afoot or any person in a wheelchair, either manually or mechanically propelled, or other low-powered, mechanically propelled vehicle designed specifically for use by a physically disabled person {sic}." People walking along roadways, pedestrians are obligated are included in this definition but must yield to motorists while on the shoulder. This is in contrast to the obligation of motorists to yield to pedestrians whenever pedestrians are using sidewalks or crosswalks.

As a practical matter, we are all pedestrians at some point in our journeys. Drivers are pedestrians at the beginning and end of trips. According to the 2001–2002 National Household Travel Survey, walking trips account for approximately 7 percent of all trips made in Wisconsin. Most trips combine walking with some other form of travel. For example, nearly every transit trip begins and ends with a walking trip. The walking components to those transit trips are not included in the overall percentage or number of walking trips despite their significant contribution to that mode of travel.

Walking rates vary by age. Generally, person under the age of 15 walk the most, while persons age 40 to 64 years old walk the least. The most common reasons for walking only trips, in order, are social/recreational, school (including college)/worship, shopping and work. (*http://www.walkinginfo.org/facts/statistics.cfm*)

2.2. Why People Walk

Pedestrian travel is important to a community's comprehensive transportation system. Many people rely on walking to get from home to work, school, the bus stop or shopping. Pedestrian facilities create opportunities that enhance mobility, particularly when those facilities are linked to transit. Examples of pedestrian facilities include: sidewalks, walkways, streetscape, crosswalks, traffic controls like walk/don't walk signs, overpasses and underpasses, multi-use paths, curb ramps, transit stops and the waiting pads at the stops, other loading areas and grade separations. Although paved shoulders are not by definition pedestrian

Table 2-1: Pedestrian travel in Wisconsin by trip purpose

Trip purpose	Total number of trips annually	Percent of all walking trips	Percent of all trips
Social/recreational	167,042,000	32.1	2.3
Return to home	153,479,000	29.5	2.1
Other family and personal	48,337,000	9.3	0.7
Shopping	37,007,000	7.1	0.5
Eat	27,605,000	5.3	0.4
School	26,692,000	5.1	0.4
To work	18,494,000	3.6	0.3
Return to work	13,369,000	2.6	0.2
Other	9,346,000	1.8	0.1
Services	8,907,000	1.7	0.1
Work-related	6,990,000	1.3	0.1
Religious	2,608,000	0.5	–
Medical/dental	763,000	0.02	–
Total pedestrian trips	520,639,000	99.9	7.0

Source: U.S. Department of Transportation, 2001 National Household Travel Survey

facilities, these treatments can still act to provide an important safety zone away from traffic.

Approximately 40 percent of all trips in Wisconsin urban areas are less than 2 miles according to the 2001–2002 National Household Travel Survey. Table 2-1 presents the breakdown of pedestrian travel in the state. The most common pedestrian trip (32 percent of all pedestrian trips) is for social or recreation purposes. Almost 4 percent of Wisconsin's population walks to work. That translates to 520 million trips by foot a year

2.3. Pedestrian Connections with Other Modes of Travel

Most trips involve walking, even trips made by car. Drivers are pedestrians at the beginning or end of trips. People walk along sidewalks or through parking lots to get to work or stores whether they arrived by car, walked from the bus stop or bike racks, or walked from home.

Transit depends on pedestrian access. Providing pedestrian facilities to the places people often travel—shopping areas, medical facilities, government buildings, and places of employment—makes a significant difference in how practical it is to use transit. The absence of sidewalks or other pathways from bus stops to stores discourages the use of transit to get to those stores. This is especially true considering how often Wisconsin's winters or other stormy weather make walking along a road shoulder impractical.

Walking links up with other types of travel such as driving to an airport parking lot and having an easy walk to the terminal, or being able to safely walk through a park-and-ride lot to a transit stop.

2.4. Characteristics of Pedestrians: Variety of Needs among the Walking Public

Pedestrian facilities have historically been designed for the average user, rather than for all users. Since people have differing physical abilities, having a basic understanding of different populations and which pedestrian facilities can and cannot be used by diverse groups of pedestrians is one of the first steps in creating facility designs that help maximize safety and pedestrian access in a community.

Today, pedestrian facility design requires accessibility to a full range of users in contrast to designing for the average pedestrian as in the past. For example, all pedestrians need to get from the sidewalk to the roadway to cross a street at some point. Old design methods did not provide a way for wheelchair users to get safely over the curb or a senior citizen using a wheeled cart to do grocery shopping. Curb ramps provide a simple adaptation to eliminate the curb barrier. While designs that did not provide a curb ramp may have met the needs of the average pedestrian, they unnecessarily limited how useful the sidewalk was for common activities of many other people. The signing of the Americans with Disabilities Act in 1990 helped to raise awareness in the United States of the significant number of people who have disabilities. Act requirements also emphasized the need for good facility design for all users.

Good planning and design recognizes the role of pedestrian travel in creating opportunities within the context of other forms of travel, and the importance of creating a transportation system that safely accommodates all types of pedestrians including seniors, people with disabilities and children. An example of good pedestrian design might include a traffic calming "lane splitter" or a "traffic island" to decrease traffic speed and create a crossing refuge. This allows pedestrians to cross a road in two stages if necessary (*see Chapter 5 for more facility design examples*). This section discusses the varied needs of pedestrians to be considered in facility design.

2.4.1. OLDER PEDESTRIANS

There are many reasons seniors may choose to walk. Walking may be a form of exercise and recreation. Other seniors may choose to reduce how much they drive, stop driving altogether, or may not own a vehicle. Many persons in this age group also use transit instead of driving a car, thus increasing their walking. The lack of safe and convenient pedestrian facilities can negatively impact a senior's independence.

The aging baby boom generation will increase the number of people age 65 and older in the next several decades. As a result, there will likely be a growing demand for well-designed pedestrian facilities to help meet their mobility needs.

Well-designed pedestrian facilities must consider some common physical characteristics of older people. Aging typically causes a deterioration of physical, perceptual and sensory abilities well before a person is no longer able to live independently in the community. Additionally, as the body ages it recovers more slowly and less completely from injuries. Crashes and falls often have more serious consequences for seniors than for younger people. For example, an older person may suffer a broken hip from falling on a sidewalk whereas a younger person may suffer only a bad bruise. Crashes between motorists and older pedestrians almost always involve a minor or serious injury for the pedestrian, or in over 5% of the cases, the death of the senior.

Physiological changes commonly experienced by older adults can make it more difficult for them to compensate for poorly designed pedestrian facilities. Examples of these physiological changes effecting walking ability include:

- **Vision limitations**—may make it difficult to see approaching cars or judge how close approaching cars are, particularly in poor weather or at night.
- **Slower walking speeds**—may make it difficult to cross a signalized crossing timed for the pace of the average younger, faster walker.
- **Reduced range of joint motion**—may make negotiating curbs and steep ramps without tripping or falling more difficult.
- **Changes in hearing**—may reduce the ability to detect, localize and differentiate sounds, such as approaching vehicles that are hidden by poor sight lines.
- **Reductions in attention span, memory, and perceptual abilities**—may make sorting out complex intersections and traffic situations more difficult.
- **Reduced endurance**—may make individuals tire more easily, making benches and shady trees very helpful.
- **Decreased agility and reflexes**.

2.4.2. CHILD PEDESTRIANS

It is an unfortunate fact Wisconsin children under 15 are involved in nearly 38 percent of traffic crashes involving pedestrians. By comparison, the national average for traffic crashes involving child pedestrians is 30 percent.

Exhibit 2-2: Kids walk more often than any other age group.

Children travel by foot more than any other age group. Some walk to and from school as well as friend's houses, parks, and recreational and other sites. Due to their lack of developmental maturity and experience, children are less able than adults to negotiate street crossings and other pedestrian-vehicle conflict situations.

Young children's ability to cope with traffic evolves slowly with age and remains quite limited in the first decade of life. As a result, children face a higher risk for injury in any situation where pedestrian facilities are inadequate, such a lack of sidewalks and crosswalks, or where visibility is impaired.

Sidewalks that provide a safe and convenient connection for children from the home, through the neighborhood and to the school are an important consideration. As new subdivisions are designed or as existing neighborhoods are retrofitted, planners need to give careful consideration to children's expected travel patterns from home to school. This requires the designer to 'walk in the same shoes' as the child so that the subdivision design or neighborhood plan reflects the needs of both children and adults.

Children have limited transportation options. Although this varies from school to school, perhaps even in the same school district, walking to school can include significant numbers of children. Identifying children's' limitations is not intended to discourage walking among youth, but instead to help address these limitations through engineering, education and enforcement measures. Common limitations of children under the age of 10 include:

- One-third less peripheral vision than the average adult, reducing their ability to detect vehicles on the edge of their vision, such as turning vehicles.
- A narrow focus on a particular activity that keeps them from paying attention to their surroundings, such as running after a ball into the street without looking for traffic.
- Shorter stature than adults, making it more likely they will encounter situations where they cannot see or be seen by traffic.
- Less developed hearing, making it difficult to determine from which direction vehicles are approaching and how close the vehicles are.
- Lower cognitive ability and experience to judge speed and distance, making safe crossings more difficult.
- Inability to read or comprehend signs and traffic signals.
- Inexperience in dealing with complex traffic situations may result in poor decisions and being unaware of looming dangers.

Although children are vulnerable when pedestrian facilities are inadequate or poorly designed, the common physical limitations outlined above also show the need for special attention to be given to the places where children are more likely to be walking, such as schools and playgrounds. Slower driving speeds on roads adjacent to these sites may give drivers more time to react to pedestrians, including children, as well as reduce the number and severity of pedestrian crashes.

2.4.3. PEDESTRIANS WITH DISABILITIES

The 2006 American Community Survey showed around 11 percent of people between the ages of 16 and 64 had a disability. This increased to 4 percent for those age 65 and older. Most individuals will experience some type of disability in his or her lifetime. Some disabilities may be temporary, such as a broken leg, while others may be degenerative from disease or as a result of aging. Disability rates increase as people age. With advances in medical care, technology, and civil rights legislation, people with permanent disabilities are more likely to live in the community rather than in institutional settings. People with permanent disabilities also are more likely to be employed outside of sheltered workshops than in the past. This independent integration into the economic life of a community can be aided or diminished by the quality of a local government's transportation environment.

People living with a disability often rely on walking and transit to a greater extent than those without a disability. Pedestrian facilities and transit agencies are essential to providing mobility and access to those with disabilities. A pedestrian facility that is not designed with a variety of users in mind will create barriers to safe travel by people with disabilities. For example, a wheelchair user will find the absence of a curb ramp or an uneven sidewalk to be a barrier requiring retracing movements in order to find an accessible route to the destination. This detour magnifies the problem by a factor of two. It takes more energy to propel a wheelchair than it does to walk the same distance and the trip has been lengthened by having to retrace steps as well. Similarly, a pedestrian with a visual impairment may find a busy street impassable without easy to locate crossings or sufficient signaling to regulate the traffic.

Inadequate traffic enforcement efforts can create additional barriers if traffic is moving faster than posted speed limits or drivers are not routinely respecting the pedestrian's right of way at street crossings. Just one barrier can have a disproportionate effect on the ability of pedestrians with disabilities to make simple trips. Design practices sensitive to the fact that people with disabilities are a regular part of the walking public can eliminate many of these types of problems (Exhibit 2-3).

2.5. Impact of Disabilities on Pedestrian Activity

Understanding characteristics common to different disabilities can help explain why certain standards have been developed as well as how to apply the flexible standards in real life application.

The broad categories of disabilities and illustrations of related pedestrian facility needs include:

- **Mobility Impairment**: People with mobility impairments include those who use assistive devices such as wheelchairs, crutches, canes, walkers and prosthetic limbs. According to

the 2000 U.S. Census disability statistics, 6.4 percent of Wisconsin's population aged 16 and older reported having difficulty going outside the home due to permanent or temporary disabilities. Design adaptations include appropriate curb ramps, minimal sidewalk and street cross and running slopes, smooth sidewalk surfaces, and crossing signal activation buttons placed within the reach of someone in a wheelchair. Often overlooked yet important design considerations include adequate clearance for wheelchair users at crosswalk markings, pedestrian refuges at medians that provide the extra room needed by people using assistive devices such as walkers and wheelchairs, sidewalks that are at least five feet wide, and sight lines created with a seated wheelchair user in mind.

Exhibit 2-4: People with disabilities travel in all types of weather.

- **Vision Impairments**: Provisions include considering problems with depth perception, full or partial blindness, tunnel vision, functional blindness, low vision, or color blindness. Since there is a range of visual impairment, assistive technologies vary including: corrective lenses, "white canes," and/or guide dogs. For people with this type of disability, intersections are easiest to negotiate when the line of travel from the edge of the sidewalk to the opposite curb is straight rather than skewed. Pedestrians who are visually impaired are disproportionately impacted when motorists are allowed to make right turns on a red traffic signal. Drivers approaching an intersection to turn right may be looking for traffic from the left and not be aware of a pedestrian entering the crosswalk on their right. If the pedestrian has a visually impairment, he/she has less of an opportunity to act defensively to a threat they are unaware of. Sidewalk design considerations include limiting obstructions along the travel path, such as tripping hazards or signs sticking out so far from their base that they can easily be run into.

Exhibit 2-5: Proper snow clearance makes using curb ramps safe for everyone.

- **Hearing Impairments**: Pedestrians who have hearing impairments are disproportionately impacted by fast moving traffic, because of the potential for quickly changing crossing conditions. The way may be clear at the start of crossing but can change rapidly as more traffic enters the street. Pedestrians with full use of their hearing are warned of the increased danger first by hearing approaching cars. This extra information is not available to someone with a hearing impairment and puts her or him at a disadvantage in rapidly changing situations. Driveways with poor sight lines may also be a challenge because pedestrians with hearing-impairments are unable to rely on more than one sense to overcome poor sight lines that can obscure cars backing out of driveways.
- **Cognitive Impairments**: Facility designers should be aware that people with cognitive impairments tend to have greater difficulty comprehending and negotiating unfamiliar or complex environments. Consistency and clarity of signage is especially helpful. Table 2-2 summarizes some of the needs of a variety of pedestrians.

While each of these groups is different in its physical characteristics, pedestrian facilities should be designed to accommodate the various needs reflected in accessibility standards.

Table 2-2: Movement barriers

User description	Environmental movement barriers					Individual movement barriers			
	Difficult terrain	Soft surface	Obstacles	Signal actuation	Complex decisions	Limited agility	Limited endurance	Limited speed	Unpredictable movement patterns
Stroller user	✔	✔	✔				✔		
Wheelchair user	✔	✔	✔			✔	✔	✔	
Inline skater	✔	✔	✔			✔			✔
Individual with limited balance	✔	✔	✔			✔			✔
Individual with a vision impairment			✔	✔			✔	✔	✔
Older adult					✔	✔	✔	✔	✔
Child	✔				✔	✔	✔		✔
Individual who is obese	✔					✔	✔	✔	
Crutch or support cane user	✔	✔	✔			✔	✔	✔	
Individual with low fitness levels	✔						✔	✔	
Individual with a cognitive impairment				✔	✔			✔	✔
Individual with an emotional impairment					✔				✔

2.6. ADA Regulatory Issues

There are a several legal requirements addressing the transportation needs of people with disabilities. The Americans with Disabilities Act (ADA) of 1990 legally requires private and governmental organizations to provide access to their programs and services, including transportation systems. Transportation systems are addressed in a number of ways, from transit use to providing accessible public-right-of-way for pedestrians. The ADA builds on previous commitments to providing access, such as those made in the Rehabilitation Act of 1973.

The U.S. Architectural and Transportation Barriers Compliance Board (Access Board) is in charge of creating physical standards that define accessibility. Section 14 of the ADA Accessibility Guidelines (ADAAG) was reserved for pedestrian facilities within the public rights of way. As of 2008, the Access Board had developed a draft set of guidelines for public rights of way, but had not submitted those guidelines for final rulemaking. At this time, those guidelines are considered to be best practices and should be followed. However, certain aspects of those accessibility guidelines, such as curb ramps, have already been addressed in other parts of ADAAG or the Rehabilitation Act, and are therefore already considered a regulation or mandate.

The Access Board's goal has been to bring together knowledge of engineering practices and knowledge about the needs of people with a variety of disabilities. Although the Access Board's draft guidelines for the public right-of-way has not been approved by the Access Board or the U.S. Department of Transportation, there exists a body of work on accessibility. Several U.S. states and communities have been implementing a broad range of accessibility standards for pedestrian facilities for at least a decade. Some distinct portions of accessibility, such as standards for curb ramps, have been implemented since the late 1970s on federally aided projects.

Table 2-3: Accessibility Regulatory Timeline		
1961	American National Standards Institute (ANSI) A117.1 published	First national standard for accessibility. Compliance was voluntary. Standard was revised several times formed the basis for federal standards adopted later.
1968	Architectural Barriers Act, with 1970 and 1976 major amendments	Mandated that buildings designed, constructed, altered, or leased with federal funds would comply with standards for accessibility. Established much of the detail of wheelchair accessibility later applied to the right of way.
1971	Rehabilitation Act	Section 504 banned those receiving federal funds from discriminating against those with disabilities.
1978	Rehabilitation Act Section 504 implementing regulations released; Independent Living Centers first funded	Required program accessibility. Advent of Independent Living Centers signaled a shift from institutionalizing to mainstreaming into the community
1984	Uniform Federal Accessibility Standard (UFAS).	Published by Federal Architectural Barriers Act rule-making agencies
1990	Americans with Disabilities Act	Clearly established accessibility as a civil rights issue. Title V requires the U.S. Access Board to issue minimum guidelines for accessible design to ensure that buildings, facilities, rail passenger cars, and vehicles are accessible in terms of architecture and design, transportation, and communication to individuals with disabilities
1991	Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) first published	Are integral to the creation of standards for the public right of way. Based on specifications established in UFAS and ANSI A117.1-1980 and–1986.
1994	Interim Guidelines for the Public Right of Way issued	Guidelines did not move to final rulemaking. Units of government are still responsible for achieving accessibility because of previous regulations as well as the ADA implementation requirements.