

The Big Picture ∞ Chapter 1



PHOTO BY MICHAEL RONKIN

Land Use

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Streets: The Arteries of Life

**How Pedestrians Are Affected by Traffic:
Volume and Speed**

ADA Design Guidelines

Walking is such a basic human activity that it has frequently been overlooked in the quest to build sophisticated transportation systems. Now people want to change that. They want to live in places that are welcoming, safe, and enjoyable. They want livable communities where they can walk, bicycle, recreate, and socialize.

Creating a pedestrian environment involves more than laying down a sidewalk or installing a signal. A truly viable pedestrian system involves both the big picture and the smallest details—from how a city is built to what materials are under our feet. Facilities should be accessible to all pedestrians, especially those with disabilities and children. Accessible design is the foundation for all pedestrian design and facilities need to be planned, designed, operated, and maintained to be usable by all people.

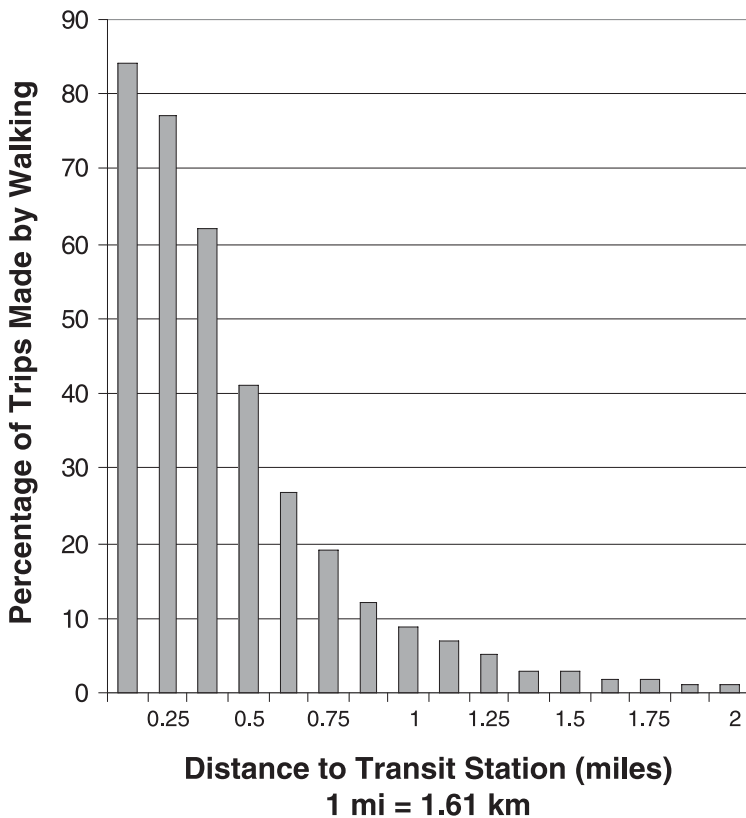
Because most of the work that will be done involves retrofitting existing places, improving the pedestrian environment will probably be done on a street-by-street, neighborhood-by-neighborhood basis.



PHOTO BY CARA SEIDEMAN

Design streets for people to use them.
Assume people will walk.

The Relationship Between Distance to Transit Facility and Pedestrian Mode Choice



Source: Federal Transit Administration, Transit Cooperative Research Program, Transit and Urban Form, TCRP Report 16, 1996. Chart adapted from Figure 19.

LAND USE

Creating a walkable community starts with the very nature of the built environment: having destinations close to each other; siting schools, parks, and public spaces appropriately; allowing mixed-use developments; having sufficient densities to support transit; creating commercial districts that people can access by foot and wheelchair; and so on. Most walking trips are less than 0.8 km (0.5 mi).¹ While mixed-use developments with sufficient density to support transit and neighborhood commercial businesses can make walking a viable option for residents, single-use, low-density residential land-use patterns discourage walking. When residents are segregated from sites such as parks, offices, and stores, there will be fewer pedestrian trips because destinations are not close enough for walking. The connection between land-use planning and transportation planning is critical, but all too often ignored.

Integrating land-use and transportation planning allows new developments to implement these strategies from the onset. Communities that support balanced transportation make walking and public transit attractive options.



A busy commercial street in Ann Arbor, Michigan, emphasizes pedestrian use and provides attractive areas for people to sit, stroll, and meet.

In established communities, many of these goals can be met with “in-fill development” to increase density and community viability. Changes in zoning laws and sidewalk warrants to allow mixed-use development and pedestrian connections, such as sidewalks, easy-to-access crosswalks, and shared-use paths, can also increase pedestrian safety and mobility.

ASSUME THAT PEOPLE WILL WALK

Whether building new infrastructure or renovating existing places, it should always be assumed that people will walk and plans should be made to accommodate pedestrians. People will want to walk everywhere they can, and a comfortable, inviting, and safe environment should be provided for them. There are many reasons that people walk: to run errands, to visit neighbors, to go to local stores, to take their children to the local park, for exercise, or even for the sheer enjoyment of being a pedestrian. Children should be able to walk to school or to their friends’ houses. All of these activities constitute

a significant number of trips. About four-fifths of all trips are non-work-related.¹

If people aren’t walking, it is probably because they are prevented from doing so. Either the infrastructure is insufficient or has serious gaps. Are there continuous walkways? Are there physical barriers such as rivers, drainage ways, walls, or freeways that prevent convenient walking access in a community? Do bridges for automobiles also provide a safe walking area for pedestrians? Does the lack of curb ramps or the existence of steep grades or steps prevent access for the elderly or people using wheelchairs? Are there information barriers preventing people with visual disabilities from crossing the street? Is there a major road that separates the residential neighborhood from the commercial district? Are there places for people to cross roads safely?

Walking rates in different neighborhoods within the same city are directly related to the quality of the system. In other words, in high-quality pedestrian environments, lots of people walk. Where the system fails—missing sidewalks, major barriers, no safe crossings—people walk less, and those who do are at greater risk.

People also want to walk in an environment where they can feel safe, not only safe from motor vehicle traffic, but safe from crime or other concerns that can affect personal security. Areas need to be well lit to encourage walking during evening hours. If the pedestrian system is not accessible, it is often not safe. For example, lack of access may cause wheelchair users to use the street rather than a poorly maintained sidewalk. Some populations may be at a higher risk of pedestrian crashes. Children under age 15 are the most overrepresented group in pedestrian crashes and people over age 65 have the most pedestrian fatalities. Therefore, it is especially important to provide adequate facilities in the vicinity of land uses such as retirement homes and school zones. But it is important to keep in mind that children and people who are elderly or have disabilities are part of every community, so adequate facilities are needed everywhere people are expected to walk.

The walking environment should be open and inviting, but not sterile and vacant. Pedestrians need more than sidewalks and crosswalks. In addition to protecting pedestrians from motor vehicle traffic, it is important to have a secure, pleasant, and interesting walking environment to encourage people to walk.

Traditionally, safety problems have been addressed by analyzing police crash reports and improvements have been made only after they are warranted by crash numbers. However, planners and engineers should consider

problem-identification methods such as interactive public workshops, surveying pedestrians and drivers, and talking with police to identify safety problems in an area before crashes occur. This may help proactively identify locations for pedestrian safety improvements and will involve citizens in the process of improving safety and mobility in their own communities.

TRANSIT

Walking and transit are complementary. Good walking conditions for pedestrians are important inducements to using public transportation, since most public transit trips include a pedestrian trip at one or both ends. People should be able to walk to a bus stop or a train station from their homes and to jobs, shopping, and other activities. Conversely, good public transportation, with buses, subways, and paratransit vehicles that run frequently and are reliable, is essential to achieving a walkable city. The trip should be as seamless as possible and transit stops should be friendly, comfortable places. Consideration needs to be given to the location of the stop relative to intersections, how to get transit users safely across the street, and a variety of other issues. For more information, refer to Chapter 14 in *Design and Safety of Pedestrian Facilities*.²

When development occurs around a transit stop, more transit can be supported, and people will have more options for how to travel there. Special attention should be paid to how people will get from the transit stop to their destinations. No matter how convenient the trip is otherwise, if pedestrians don't feel safe for even a short distance, they will choose not to go, or to go by another mode (usually driving—and the more people who drive, the less pedestrian-friendly a place becomes).

STREETS: THE ARTERIES OF LIFE

Streets serve many functions, including:

- Linkage. They connect parts of cities to each other, one town to another, and activities and places.



This roadway may act as a barrier to pedestrians. Those who are walking along the waterfront may find it difficult to cross to the commercial establishments and those on the commercial side may be reluctant to cross to the waterfront.

- Transportation. They provide the surface and structure for a variety of modes. All modes and users should be provided for: pedestrians, bicyclists, transit, motor vehicles, emergency services, maintenance services, etc.
- Access. They provide public access to destinations.
- Public right-of-way. Space for utilities and other underground infrastructure is usually a hidden function of the street.
- Sense of place. The street is a definable place, a place for people to interact, the heart of a community. A street can serve this role by being a venue for parties, fairs, parades, and community celebrations, or by simply being a place where neighbors stop to chat.

Streets are often designed to emphasize some functions over others. At one extreme is a limited-access highway that serves as a corridor for motor vehicle travel. At the other extreme is a private cul-de-sac, which has no linkage and has limited access. Many streets are designed so that certain desirable functions are not provided. Examples include commercial streets where access to destinations is difficult, and strip development along high-speed roads where no sidewalks or pedestrian crossings exist.

When streets and roads are evaluated for improvements, it is helpful to consider whether the design effectively meets all the desired functions of the roadway. If not, the street should be redesigned to adequately meet those functions.

HOW PEDESTRIANS ARE AFFECTED BY TRAFFIC: VOLUME AND SPEED

High volumes of traffic can inhibit a person's feeling of safety and comfort and create a "fence effect" where the street is almost an impenetrable barrier. The effect of traffic volumes on community life has been measured. In his seminal 1980 study, Donald Appleyard looked at how traffic volumes on comparable streets in San Francisco affected community life. People living on a street with light traffic (2,000 vehicles per day) had three times as many friends and twice as many acquaintances on the street as did people living on a street with heavy traffic (16,000 vehicles a day).³

Traffic speed is usually the more critical aspect to walkability and safety. Though pedestrians may feel comfortable on streets that carry a significant amount of traffic at low speeds, faster speeds increase the likelihood of pedestrians being hit. At higher speeds, motorists are less likely to see a pedestrian, and even less likely to actually stop in time to avoid a crash. At a mere 49.9 km/h (31 mi/h), a driver will need about 61.0 m (200 ft) to stop, which may exceed available sight distance; that number is halved at 30.6 km/h (19 mi/h).⁴

Unfortunately, most of our streets are designed to encourage higher traffic speeds. Fortunately, we do have tools that can change this, primarily by redesigning streets through traffic calming or by designing new streets with lower design speeds. Speed reductions can increase pedestrian safety considerably. The safety benefits of reduced speeds extend to motorists and cyclists as well, although the



Pedestrian injuries are less severe on lower speed roadways. The street pictured above is a heavily traveled arterial in one of Seattle, Washington's thriving residential neighborhoods. High speed and concerns about pedestrian safety resulted in the redesign shown in the "after" picture. Bike lanes and a median strip have encouraged slower traffic speeds. Speeds were reduced by about 4.8 km/h (3 mi/h), while average daily traffic remained about the same.





Street designs that accommodate people with disabilities create a better walking environment for all pedestrians.

advantage to pedestrians is the most substantial.

ADA DESIGN GUIDELINES

The Americans with Disabilities Act (ADA) was enacted in 1990 to ensure people with disabilities have equal opportunities and access to public spaces as those who do not have disabilities. People with disabilities may have diminished mobility, limited vision, or reduced cognitive skills. In some instances, individuals may experience a combination of disabilities, which is more common as a person grows older. A person may experience a disability on a permanent or temporary basis. Without accessible pedestrian facilities, people with disabilities will have less opportunities to engage in employment, school, shopping, recreation, and other everyday activities. New or altered facilities must provide access for all pedestrians. This also needs to occur when implementing all the tools and treatments that are presented in this guide.

While improvements for persons with disabilities were mandated by the Federal Government to ensure access and mobility for physically-challenged pedestrians, most of these improvements benefit all pedestrians. Some of the items that will be presented in this guide, such as adequate time to cross streets, well-designed curb ramps, limited driveways, and sidewalks that are wide and clear of obstructions and have minimal cross-slope, are examples of design features that will accommodate pedestrians with disabilities, persons using strollers, and indeed, all pedestrians.⁵

All new construction or retrofit projects must include curb ramps and other accessible features that comply with ADA requirements. Agencies should review their street system to identify other barriers to accessibility and prioritize the needed improvements. This review was a requirement of the Rehabilitation Act (1973) and ADA. States, cities, and other localities were to develop a planning document and a transition plan for removing barriers in their existing facilities. The barriers should have been removed by 1995. Examples of barriers that are often overlooked include poles and signs in the middle of a sidewalk, steeply sloped driveways, and interruptions such as broken or missing sidewalk sections. An adequate level of surveillance and maintenance is also important to providing accessibility, especially in winter months in areas where snow accumulates. While all streets should be upgraded to be accessible, public agencies should set priorities for high-use areas, such as commercial districts, schools, parks, transit facilities, etc., and retrofit as rapidly as possible.

The design criteria for the construction and alteration of facilities covered by law were developed by the U.S. Access Board and are the ADA Accessibility Guidelines (ADAAG). These guidelines serve as the basis for standards that are maintained by the U.S. Department of Justice and the U.S. Department of Transportation and are the minimum criteria for designing public right-of-way space. In addition, the Access Board is currently developing Public Rights-of-Way Guidelines, which will supplement ADAAG. A draft version of these guidelines is available at www.access-board.gov/rowdraft.htm. For the latest ADAAG information and guidance on ADA requirements and issues, visit www.access-board.gov.