HEALTHY WALKWAYS: A GUIDE FOR PREMISES LIABILITY

by M. Gordon Brown

ABOUT THE AUTHOR

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THE ONCE AND FUTURE SIDEWALK

For years, Americans have been walking less and less. Pedestrian journeys have gotten fewer and shorter. A recent report on pedestrian safety says Americans take 42 percent fewer trips by foot than they did just 20 years ago. One author said 600 feet is the maximum distance an American will walk before turning to the car. It would be difficult to walk less than we do now. To go out for a stroll sounds both quaint and anachronistic. However, there is good news: Americans are beginning to walk more...gradually.

We often look to and envy European cities for models of good pedestrian environments. This is partly due to their density, which is a function of the period in which they were built. We think of European cities evolving in a period that supported pedestrian life. Keep in mind, though, that great walking cities like Paris were terrible places for most pedestrians before the 19th century. Sidewalks were few and pedestrians moving about had to avoid horses, carriages, and carts second by second. Not only that, but muddy streets were also storm sewers and often a dumping ground for garbage, debris, and sewage. The potential for robbery was sometimes more certain than flickering nighttime illumination.

Today, there are a few things we notice quickly about European city life: (1) the high level of pedestrian amenity; (2) the rule-abiding character of European pedestrian culture: few Europeans jaywalk; and (3) the absence of parking meters and street signs on stanchions near the curb. Part of this is because European city walkways are more crowded, allowing less chance to avoid moving cars, motorcycles,

scooters, bicycles, and trams. Also, due to the history of European city development, pedestrian ways were established as functional entities that would be more than spatial appendages to streets. It is said that Parisian sidewalk culture is not what it used to be with so many sidewalk cafes having closed over the past two decades. Even so, the streets in Paris, as well as those in London, Berlin, and Rome reverberate with pedestrian life.

A sidewalk in original British-English usage was referred to a secondary walkway near a primary or central walkway, not as a walk aligned alongside a street. In British-English usage, pavement refers to what we Americans call a 'sidewalk' and is distinguished from a 'roadway.' In Britain, you *walk* on the pavement, but *drive* on the roadway. The phrase, "pounding the pavement," makes more sense in this context.

What brought better sidewalks to European cities and made them the great places they are for pedestrians today was the development of modern retailing in 19th century Paris after the fall of the *ancien regime*. Retailing and entertainment literally "paved the way" for the public ways that are so familiar now.

First were the dozens of *passages couverts* (covered arcades with shops and cafes), developed by entrepreneurs and developers to exploit the new large plate glass developed by the St. Gobain glassworks and the new possibilities of access after the break up of the great church and aristocratic urban estates. These were the first covered malls, some 180 years ago—the places where the *flaneur*, (the new middle-class social animal), could engage his counterparts in these new public places. Many were developed to counter the outward migration of shoppers. As suitable sidewalks became more common in the city, especially with Baron Houssmann's overhaul of Paris's medieval street system, many *passages couvert* failed or were converted to other uses later in the 19th century. The still-enchanting Galerie Vivienne remains as one of the best examples.

In many American cities, the specific results will be different but the same process is now underway. The development of American shopping centers over the past six decades was partly about making good places to walk and shop. As urban areas mature, the need for many early shopping centers is predictably waning as human movement patterns change. Consider that an airport concourse often functions very much like a walkway along a retail street with displays, vendors, shops, and restaurants. Walking habits are beginning to change for two reasons: to improve health and to relieve traffic congestion. They work together.

The accelerating movement to create more walking places is one of the most widespread and important developments in the United States. In the coming years, it will result in increased pedestrian activity. No one doubts that frequent, vigorous walks are one of the easiest ways to combat weight gain and physical and mental decline coming from aging. Furthermore, the New Urbanism, pre-WWII town planning and design approaches, a revival of interest in core city living, and new transit systems are beginning to result in less reliance on cars and more places where trips can and must be taken by foot. The development of new multi-use retail-cultural-entertainment-sport centers and clusters in so-called 24-hour zones of cities puts more people on their feet. In the coming years, we can expect that increased numbers of Americans will take more trips by foot and that these trips will be longer. They should also be safe and enjoyable.

WALKING & FALLING

Surprisingly, a large number of accidents, mostly slips and falls, happen on ordinary pedestrian ways—both private and public. In 1993-1994, there were eight million emergency room visits for falls. Approximately eight percent of all deaths from injuries, (over 11,000), are *known* to come from falls. While less than 10 percent of fall deaths result from falling on level ground, many such falls result in disabling injuries—sprains and fractures to legs, arms, hips, wrists, ankles, or the skull. As the American population ages, injuries resulting from falls could become a more serious and widespread problem.

In most communities, property owners are responsible for the sidewalks adjacent to their property and are liable for damages or injuries resulting from defective conditions. Responsibility usually includes construction; maintenance and repair of the sidewalk; and ensuring that debris and projections like signs, tree limbs, and bushes do not obstruct movement. Commercial property owners and business improvement districts are usually under a much greater obligation than residential owners to fulfill these responsibilities. Furthermore, local governments are no longer as immune as they once were.

Property owners will need to address the condition of the walkways on their property and in the public

space abutting it. One unforeseen impact will be a change in the relationship between public space and private space, especially in the interface or the transition zone between the two, at entries and exits where there are changes in level, materials, illumination, weather, and visual cues. Business property owners will need to attend to the configuration of this interface because the transition zone is one of the principal areas in which pedestrian accidents occur.

Although the design, construction, and maintenance of walkways would seem to be a matter of common sense, there are many instances where common sense appears to have failed. Not only is there more to the effective functioning of walkways than might first appear, but surprisingly, there is little explicit knowledge of what makes a good sidewalk.

Because of the systematic way in which we analyze how design affects way-finding in problem properties, our consulting over the past several years has taken us into personal injury suits involving the places we walk. Most of these have involved transitional spaces such as private property thresholds, and each could have been prevented if walkways were not carelessly maintained, defectively built, and/or poorly designed.

In one instance, a couple in their 60s had an early dinner at a popular chain restaurant. At about 5 p.m. on sunny day in mid-May, they walked out heading to their car in the parking lot. As she walked, she didn't see the edge of the two or three stair steps in her path and tumbled down. Her multiple fractures left her with a six-figure health care bill. The actual site conditions conformed to the design drawings, which showed a condition of merging treads and risers as the site's slope gradually increased. In this particular instance, the two to three steps looked like a ramp because in the bright afternoon lighting conditions of that season, it was difficult to identify the edge of the stair tread. This was an example of poor design.

In another, a young woman exited her friend's townhouse on a late, early winter afternoon, walked down two steps and turned to head to her car. As she took a step on the sidewalk, her foot slid out from under her and she fractured her wrist in several places as she thrust her hand out to cushion her fall. In this case, part of one sidewalk slab was about five inches lower than the slab adjacent to the steps. Instead of rebuilding and raising the lower sidewalk, the sidewalk builder beveled the edge where the two slabs connected so there was a short but steeply angled slope connecting them. With the snow, it was slippery. In the poor light at that time, it was difficult to see. This was an example of defective construction.

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A third injury occurred at the entrance to a major performing arts building. A husband was pushing his wheelchair-bound wife across the plaza to go into the building. The double-door entries were all open. As he wheeled her through a doorway, the wheels hit something on the surface and the chair bounced ejecting the woman and breaking again her already fractured leg. It later required amputation. The threshold plate was set at a level that was too high and functioned like a speed bump. This was an example of defective construction and careless maintenance.

The list could go on. The individual physical cost of falls, the discomfort, pain, temporary or permanent loss of mobility and the use of one or both hands, and society's financial cost are all equally beyond measure. What is *not* beyond measure is the financial cost—to individuals and to property owners.

FACTORS AFFECTING SIDEWALK USE

Three principal factors affect how walks are used: human, environmental, and configuration. While many environmental and human factors involve patterns that can be predicted on a statistical basis, they are not controllable. Configuration factors, on the other hand, which are designed responses to environmental and human factors, are largely controllable. Although there is anecdotal evidence that each of the factors weighs differently in contributing

to falls, from our research, there appear to be no scientific studies that assess or assign weights to the various configuration factors.

Environmental factors

The natural and the human built environment each affect how a walkway can be used. The natural environment involves variations in terrain, subsoil, vegetation, and weather. Terrain variations will obviously affect walkway configuration and could require steps, ramps, cuts, and fills. Other environmental factors vary, but in ways that are usually predictable. Walking outdoors is affected by seasonality, weather, and time of day, all of which can alter light, shading and shadows, precipitation, and temperature. Temperature, wind, light, and the form and amount of precipitation vary with the season.

Geographic region has an impact. In New Orleans, you can count on 50 to 60 inches of rain a year. In some seasons, there are regular, heavy rains that end before late afternoon. In semi-arid, mountainous Colorado, microclimatic variations are more frequent than in other regions. In winter, the sidewalk on the north side of the street, the sunny side, is more likely to be dry and free of snow and ice, as opposed to the shady south side. Diurnal variations, (*i.e.*, day-night), can easily be 30 degrees Fahrenheit. In the winter, with low light and long shadows for most of the day, collected moisture will freeze quickly when surfaces cool even if there have been relatively mild (above freezing) temperatures during the day.

The human built environment served by walkways affects their use. Walkway width in areas of commercial land use needs to be wider than in residential areas. Walkways at the entrances and exits of performance, entertainment, and sports facilities need to accommodate large crowds of persons with varying physical capabilities. Walkways in parks may curve and meander. Walkways interfacing with parking areas for automobiles and bicycles require special consideration. Walkways immediately adjacent to rapidly moving traffic need to be wider and protected from out-of-control vehicles.

Human factors

The human population's ability to use walkways varies. Human factor variables involve demographic factors like age, sex, and marital status. Human perception, cognition, and coordination are factors that vary with a person's age, sex, physical condition, attention, stress, fatigue, alcohol consumption, infirmity, and short-term and long-term memory. These affect how persons map the environment, choose, and use routes.

Age is a significant factor in falls. Persons 65 or over fall and are injured more frequently and severely than younger persons. Sex difference is another significant factor. Females fall on stairs more than males. However, males up to age 14 (*i.e.*, boys) fall more than females in the home. Combining age and sex factors indicates that elderly women fall more. Vision and type of correction in glasses can affect what is seen. Persons who are wheelchair-bound and vision-impaired usually give special attention to movement requirements. Places that serve persons who are less physically able, like senior housing and health care institutions, and places that serve alcohol, should be especially cognizant of the condition of their walkways.

Human physiological factors are influential, but in unexpected ways. An important aspect is the nature of the human gait, which varies considerably according to both individual characteristics and environmental and configurational characteristics. In a normal gait characteristic of walking on a level surface, a pedestrian's heel touches the surface at about a 30-degree angle of incidence. In wet or slippery conditions, most people consciously shorten their stride length and thus reduce the angle of incidence. The gait used in ascending steps differs from the gait used in descending them. The human cone of vision normally does not include the area immediately in front of the feet.

Cognitive factors affect how pedestrians retrieve information from their environment. A pedestrian's attention to conditions can vary depending on distractions and behavior. A variety of things can distract a walker's attention from the sidewalk but a common one is packages (like grocery sacks) that obscure vision of the surface immediately underfoot. Like drivers, pedestrians engaged in conversations, (on mobile phones for example), do not fully attend to the route they are traversing.

Depending on the cues embedded in the configuration, pedestrians choose channels of movement sometimes consciously, but usually not. Route choice and navigation are strongly influenced by the spatial and material conditions that allow perception of a channel through which one can walk. For example, perceived continuity in one direction may not be similar to what is perceived in the opposite direction. Thus, in emergencies, people will often try to exit a building using the route they

used to enter it rather than by the designated emergency exit. Sidewalks clearly define a channel of movement. Where no channel is defined, route choice will be influenced by how conditions like openings, signs, and barriers around the destination are perceived.

To a large extent, walking is governed by spatial cognition, which may be determined by handedness (left versus right hand dominance) and by social convention, which relates to right dominance in most of the population. Consequently, most people walk on the right side of a walkway. We have observed this in studies of shopping behavior in indoor and outdoor shopping areas, on city sidewalks, in museums and galleries, and in a wide variety of settings. Templer observed similar movement patterns in relation to ascending and descending stairs.

Configuration factors

Configuration includes those factors that constitute the walkway corridor to accommodate variations in human and environmental factors. These are largely controllable factors. Collectively, configuration factors afford both material and information conditions for pedestrian movement. They are:

- continuity
- width
- running grade
- cross slope
- surface profile
- surface material
- surface pattern
- encroachments
- lighting
- overhead protection
- transitions

See pages 33 - 35 for an illustration and explanation of 11 configuration factors.

Each configuration factor should be considered both individually and as it interacts with other factors of configuration. For example, width and continuity patterns interact in commercial areas. Objects like streetlights and trees and tree grates create flow 'shadows' outside of normal pedestrian paths. These shadows create potential spots for sidewalk vendors, peddlers, and buskers, and for interfaces between sidewalks and streets where auto passengers can be picked up and discharged without interfering with pedestrian flow. Supports for permanent overhead protection present opportunities for displays. Surface patterns obviously interact with surface materials and can be linked to changes in continuity.

WHY WE FALL

Why do people fall? The short answer is when they cannot *recover* their balance, not just because they lose their balance. Loss of balance does not inevitably lead to a fall. Pedestrians slip, trip, stumble, and lose balance momentarily but don't fall, especially if they are non-elderly. Walking is dynamic balance and some people typically have more trouble walking, particularly those with a disability or the elderly.

For a human, the angle of incidence of the heel to the surface in normal walking is about 30 degrees. Older people and those being careful will reduce their stride length so the angle of incidence is less—about 25 degrees. In addition to sprains, there are generally two kinds of falls on level surfaces and both result in what emergency room personnel call a *foosh* (fall on out-stretched hands):

- those resulting from a trip or stumble that usually involves a fall forward;
- those resulting from a slip which usually involves falling backward.

The kinetic sequence of a the fall leading to injury starts with a loss of balance; an attempt to recover from loss of balance; recognition that recovery is not likely; an attempt to dampen impact by extending an arm in the direction of the oncoming surface; hitting the surface with a force and at an angle that could cause injury. If the arm is not extended rapidly enough, a different part of the body, like the hip, will hit the surface and be exposed to injury. All of this happens in an instant.

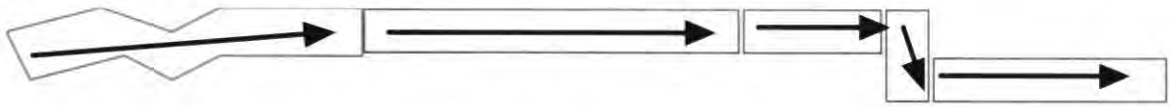
A fall happens so suddenly and unexpectedly that people sometimes cannot explain how it happened. Loss of balance can not be recovered because of a combination of gravitational force; the three-dimensional geometry of the walkway and surface condition under the feet; the kinetic patterns of leg and feet movement (gait); and the physical (neurological/muscular/skeletal) constraints on perceiving the loss of balance and, once perceiving the loss of balance, moving quickly enough to reposition the feet, the arms, and torso or manually reaching a device, like a handrail, that could slow the process and restore balance.

But, in many cases, there is a preceding cognitive sequence, or absence of one. Walkways—sidewalks,

CONFIGURATION FACTORS

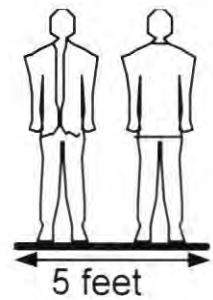
1. Continuity

Most sidewalks in improved or built residential or commercial areas are usually orientated with reference to the adjacent street and are continuous axially. Minor acute-angle discontinuities occasionally occur requiring slight reorientation of movement. Sudden or unexpected discontinuities requiring a right-angle change in direction are disorientating and, at street crossings, can be a safety hazard. Three sidewalk layouts are illustrated below. The middle indicates the preferred form of continuity.



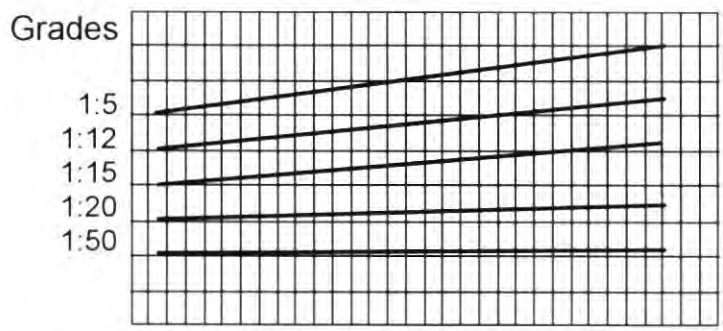
2. Width

Walkways need to be wide enough to accommodate expected pedestrian traffic volumes. In heavily used commercial areas, sidewalks may be 12 to 16 feet or more wide. Ample width is important in commercial areas because of the flow in and out of buildings and the tendency of people to slow down or stop for orientation as they leave a place. Sidewalk width in traditional residential areas is typically five feet—enough to allow two adults to pass in opposite directions. Anything less should not be considered for normal pedestrian use.



3. Running grade

Running grade is the slope of walk coincident with the designed direction of pedestrian movement. It affects effort made in walking. A sidewalk's recommended grade is no more than 1:20. For ramps it is 1:12. Grade changes should be gradual and consistent. Normally, a sidewalk should be at the same running grade as the street it abuts. A very steep grade will require the sidewalk to be stepped (as it is on many San Francisco streets). The relation of the running grade of the sidewalk to the profile a commercial building, particularly one with retail uses, is important because the shop or building entry should be at the same level as the sidewalk. When the running grade varies, it is a judgment call as to where cuts and fills are appropriate.



4. Cross slope

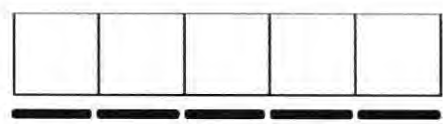
Cross slope is the slope of the walkway for water drainage, usually perpendicular to the direction of pedestrian movement and in the direction of the adjacent street. The recommended normal cross slope to allow water drainage is very slight: 1:50—with 1:25 in exceptional situations.

5. Surface profile

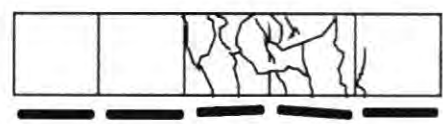
A typical American sidewalk is usually made of Portland cement concrete. When it is new, it looks like the first illustration with the concrete units intact as shown in plan on the top and in profile beneath the plan.

With weather, soil and below-grade changes over the years, the sidewalk may crack and heave. Below grade changes are often caused by growing tree roots, which can crack and raise the sidewalk. The second illustration shows typical changes.

When these changes are minor, gradual, and perceptible, they cause few problems to pedestrians. Eventually, though, they need to be repaired and the sidewalk replaced. A sidewalk should have an even surface and the edges between paving units and adjacent materials at the same level to ensure the surface under the sole of the approaching foot is flat.



Normal surface plan and profile.



Normal surface plan and profile after subsurface vegetation changes.

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CONFIGURATION FACTORS, *continued*

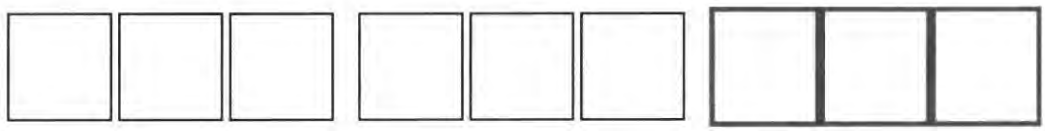
6. Surface materials

Sidewalk surfaces vary depending on expected use patterns; environmental conditions; subsurface conditions; maintenance expectations; and the need for durability, tactility, and attractiveness. Concrete is the typical material but others include pavers, stones, bricks, and asphalt,. Slip resistance with concrete is achieved by the grain of the surface, by 'brooming' concrete or by cross-hatching or scoring the surface.

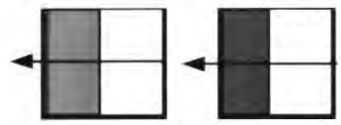
Materials for indoor walking areas, like malls and airport terminals, are far more diverse but still should be selected on the basis of durability, tactility and attractiveness along with ease of maintenance.

7. Surface patterns

A wide variety of patterns are possible depending on materials and design intent. Surface patterns should be even, consistent, have adequate friction and not be confusing. Most outdoor sidewalks have a simple pattern like that shown on the left of the figure below. Some are tiled or bordered.



Sidewalk surface patterns.



Sloped surface patterns
(arrow indicates down slope).

Distinctive patterns are not simply for decorative purposes but to provide cues for users—for store entrances, street crossings, or changes in grade. The blind, for example, use surface patterns to detect their position relative to street crossings. A pattern of cross-hatching, dimpling, or scoring is usually applied at sloped or potentially slippery areas like curb ramps.

8. Encroachments

Encroachments include bushes, tree limbs, and projections from buildings, signs, vending boxes, and trash receptacles. They should be controlled in residential areas. Encroachments like limbs and bushes force people to couch and stoop, take detours into grass, mud, or the street and can cause people to stumble or be hit by limbs causing injuries to the face and eyes. Tree limbs and bushes protruding into streets block the visibility of stop signs and oncoming traffic and cause accidents. In commercial areas, sidewalk trees and planters should be minimized and tree types carefully selected for two principal reasons. Trees can obstruct the pedestrian's and the driver's view of the business and the containers for trees and planters easily become unintended waste receptacles. Awnings over storefront windows should have ample clearance height. Stanchions clutter the sidewalks of many American cities. Signs on stanchions, lights on stanchions, traffic signals on stanchions, and parking meters on stanchions can easily fragment the sidewalk space and make it less intelligible to pedestrians and to drivers.

9. Lighting

Sidewalks are lit by daylight that varies by season, by weather conditions, by time of day, and by artificial illumination. The relationship between the light source and other objects can cause shadows, reflection, and glare.

10. Overhead Protection

Sidewalk channels receive overhead protection for two typical reasons: weather extremes and adjacent construction. In rainy climates like that of New Orleans, sidewalks in commercial pedestrian areas are often covered by second story balconies. In hot, sunny climates, sidewalks are often under sheltering arcades. In cold climates like in Minneapolis or Montreal, there is a secondary system of covered walkways—above ground or below ground.

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CONFIGURATION FACTORS, *continued*

11. Transitions

Transitions in the sidewalk corridor are part of the configuration of the pedestrian way and can be the most problematic of all configurational elements. They also interact with the other configuration factors and with the larger context of the built environment. The principal transitions are up/down (steps and ramps); in/out (doorways); turns (right/left and their reverse); and crossings. Inattention to transitional factors, especially those occurring in combination, can cause serious problems. What might be easy to see going up, going in, or turning right may be impossible to see going down, going out, or turning left. Until the past couple of decades, scientific knowledge about these transitional factors was poorly developed. Steps and doorways should be given more attention.

a. Steps

We make a distinction between stairs, which typically link one level of a building with another, and a short run of steps that does not necessarily require handrails. While Templer has thoroughly researched stairs in order to improve the functional, safety, and aesthetic characteristics of their design, his work does not appear to be widely known among designers. The configuration and design of a short run of several steps needs to accommodate the rhythm of movement in the context where they are located. Tread and riser shape are critical in the way they enhance or modify movement and make pedestrians aware of forthcoming or imminent elements of interest. The terminus of an escalator run, especially going up, can be a point of congestion.

b. Doorways

We also make a distinction between doorways and entrances. An entrance can consist of a simple door or can be a grand sequence that includes doors, steps, spaces, and visual elements that signify arrival. Height, width, and (as previously mentioned), threshold condition affect a doorway's functionality. In the past, doorways to the private sleeping quarters of rulers were sometimes built with higher thresholds and lower headers to thwart the intentions of unauthorized persons who might enter the chamber at night. Although this is not necessary now, similar conditions nevertheless exist. There are doors with barely visible push-bars and pull-handles that say "push." There are automatic doors that close too quickly on elderly shoppers. We know of package shipping stores with unwieldy doors that force customers into odd contortions as they bring in the object they wish to have packed and shipped. We know of doors that suddenly stop halfway open and others with weak closers that hit and injure users when the wind gusts. We know of large glazed areas that look like so much like doorways or openings that persons have run through them and been seriously injured.

It is not that transitions should be routinely minimized. Transitions can be extremely effective design elements that affect perception, way-finding, and meaning. The monumental stairways entering or inside of important buildings like capitols convey meaning. One of the most effective transitional areas is the covered front porch of the traditional American house. Good transitions allow a person to gather information and make decisions quickly without obstructing other pedestrians.

paths, stairs, ramps, plazas—are artifacts of human ingenuity and effort, and affordances, to use Donald Norman's term. Put simply, they afford walking—pedestrian movement. It is very difficult to find pedestrians (or just about anybody else) in places where some form of walkway doesn't exist. As artifacts, they do two things:

1. afford our actual physical movement;
2. afford *information* about our possible or planned physical movement.

In the second way, the configuration of a sidewalk is a cognitive or decision tool. It gives a pedestrian information about what to expect. Walkways can be hazardous when they *do not* afford adequate conditions for actual movement. When they *do not* afford sufficient information, or afford the wrong information, about our possible or planned movement, walkways can also be hazardous. Signs are not necessarily the whole answer. Norman says a high incidence of signs signifies a more fundamental problem.

Over the past couple of decades, a new discipline called cognitive science has emerged. Within its domain of knowledge is the relationship between the physical form of things designed for human use and the way humans actually use these things. It overlaps with human factors and ergonomics and addresses the way information is intentionally or unintentionally encoded or not encoded in the configuration of things, including everyday environments. It is used in modeling human error.

Much of the original research in this field focused on the relationship or the interface between computerized control systems and human operators. But, as research results emerged, two things became clear. First, they applied to a much wider range of phenomena beyond control systems. Second, many of the principles were not necessarily

new but were simply a part of a large body of socially applied but unsystematic forms of knowledge used in design, manufacture, and building.

Many examples of the problem can be found in the design of audio-visual equipment like receivers and VCRs. On retailer's shelves are a few pieces of equipment with knobs and buttons arranged in distinctive, asymmetric arrays that contrast with the front panel. Most, however, have their knobs and buttons arranged in patterns that require very close visual inspection to distinguish their functions. Similar problems, with more serious consequences, can be found where people walk.

Configuration factors can directly affect the *foreseeability* of the conditions that contribute to falls through their levels of coherence. On one hand, among those responsible for the walkways, they can contribute to habituation practices that limit the foreseeability of problems. On the other, among those using the walkways, they can lead to false interpretations of actual conditions.

Most falls can be traced back to the most controllable factors, the surface condition and the three-dimensional configuration of the walkway. The configuration or design of sidewalks is the most controllable of the three factors (human, environmental, configurational) affecting their use and should accommodate varying environmental conditions and use by persons of varying conditions and abilities.

CONCLUSION

Not only will more Americans be walking in the next 10 to 25 years, but there will simply be more people and more of them moving—by auto, transit, motor scooters/cycles, bicycles, (and skateboards, push scooters, skates, Segway HTs, and that which is yet to be invented). All elements of configuration will need to be addressed and the interfaces and transitions between movement modes will need more attention if they are not to become more complex, confusing, and dangerous.[1]

There is a commonsense expectation that walkways for general use in an improved area will be regular and consistent, especially on private property. The built environment is created to create continuity so that people do not have to think and analyze every movement they are about to make. In the natural environment, people don't have this expectation. That is why people go hiking—for the difference. Sidewalks are not new technology and knowledge of the proper way to build a sidewalk is not an esoteric form of knowledge. Nevertheless, surprisingly few design and building professionals, architects, landscape architects, planners, traffic engineers and contractors, are fully aware of the ways in which sidewalks can be unhealthy places.

More research on walkways will no doubt be useful and its dissemination can certainly result in improvements. But perfection is not the aim and there's no need to wait. Simple audits of the walkways by which a premises is used are easy to conduct if they are done with fresh and dispassionate eyes. Property owners and managers should include such reviews in their loss prevention programs. Otherwise, and all too often, the obvious is overlooked.[REI]

NOTES

1. For example, in 1997, 5,483 pedestrians died as a result of collisions with motor vehicles; over two-thirds were men. Sidewalk design, especially in commercial areas, will have a lot to accommodate. For the present, it's enough to get the fundamentals right.

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