

Needs of Walkers & Bikers: Dimensions of Humans

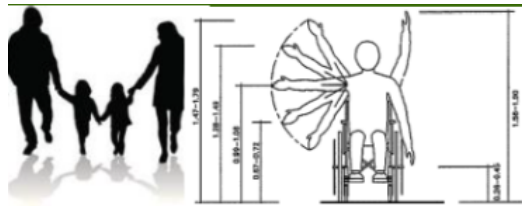
Human beings require space while walking or bicycling determined by our size and shape as well as our physical ability to move.

Pedestrians require buffer space to feel comfortable. We need space above and to our side to avoid being striking or being struck with objects. We move at greatly different speeds, runners can run up to 10 miles per hour while the mobility impaired may move at less than 1 mile per hour.



Bicyclists require as much consideration with regard to width, height, and speed. A child riding a bike will ride at a slower speed and can be less predictable. A mother may choose to use a bicycle chariot to carry a toddler, adding both length and width to her needed space.

Despite these normal human characteristics both the walking and bicycling are seldom given the depth of thought needed for such variability with limited design options made the default. The intention of this handout is to highlight how humans can differ and why context is should contribute to planning, design and operation of our community's transportation infrastructure.



Width, height, and occupied space varies

Pedestrians

Speed: Humans move at different speeds. Federal guidelines at crosswalks require walk light timing for people to walk at a 3.5 feet per second. This is a minimum, in some instances such as areas with school zones, a high population of seniors, or those with mobility limitations, additional time may be appropriate.

Width: The space we occupy is as much to our sides as in front or behind our bodies and adults are generally 12-24" wide, but may need up to three feet to feel comfortable walking in a given space, when given six inches of comfort space. A person wheelchair bound or walking with another needs greater width. A place with fences, opening doors or gates, mail boxes, street furniture and more, can narrow the space and make it less accommodating.

Height: Height is generally less of an issue for walkers than for bicyclists. Taller Americans are generally between up to 6'-4" and need an 8' vertical minimum for objects, signs or landscaping to accommodate them.

Other Needs: Other common users also need to be accommodated. Wheelchair users need ADA compliant facilities to be able to safely negotiate sidewalks, curb ramps, crossings and other such facilities. An elderly person using a walker for assistance needs a relatively flat and smooth surface free of trip hazards. Parents pushing strollers, dog owners walking their dogs, and even the physiological changes seen in American populations with the epidemic of obesity, all have concerns and considerations when choosing how to design a pedestrian network.



Be aware of multiple pedestrian types, abilities and travel speeds for buffer spaces, and adjacent design.

Bicyclists

Though sometimes lumped together with pedestrians, bicyclists are their own category of road user. A bicyclist can be a child on a small bicycle traveling at a slow speed, a novice rider on a cruiser out for a weekend ride or an expert road rider who may travel at speeds equal to moving traffic for the purposes of commuting. Each type of rider and circumstance is unique and deserves specific context analysis to determine facility type.

Speed: Most bike riders travel between 12-15 miles per hour. However, older riders or young children may ride slower than 10mph while expert, well-conditioned riders as high as 25mph.

Width: Depending on the bicycle and to a degree the rider, width is generally defined as the width of the handlebars plus buffer space of one foot on either side. This dimension can increase with the use of panniers, a child chariot or other trailer or a unique bicycle.

Height: Bicyclists typically have the same vertical clearance needs a pedestrian with 8' vertical minimum for objects, signs or landscaping to accommodate them. Taller individuals or bike riders riding bikes with frame dimensions outside the normal sizes may need more.

Other Needs: Often overlooked when thinking about bicyclists are other features not always synonymous with "infrastructure." System elements such as safe, stable, and usable bike racks, space free of debris and obstruction, and a driver awareness of giving bicyclists at least a 3-foot buffer and looking for bicyclists when making turn movements or lane changes, are all critical to making a community's investment into bicycle infrastructure successful and valued.

An illustration of dimensional space for varying users of pedestrian, bicycle and multi-use spaces

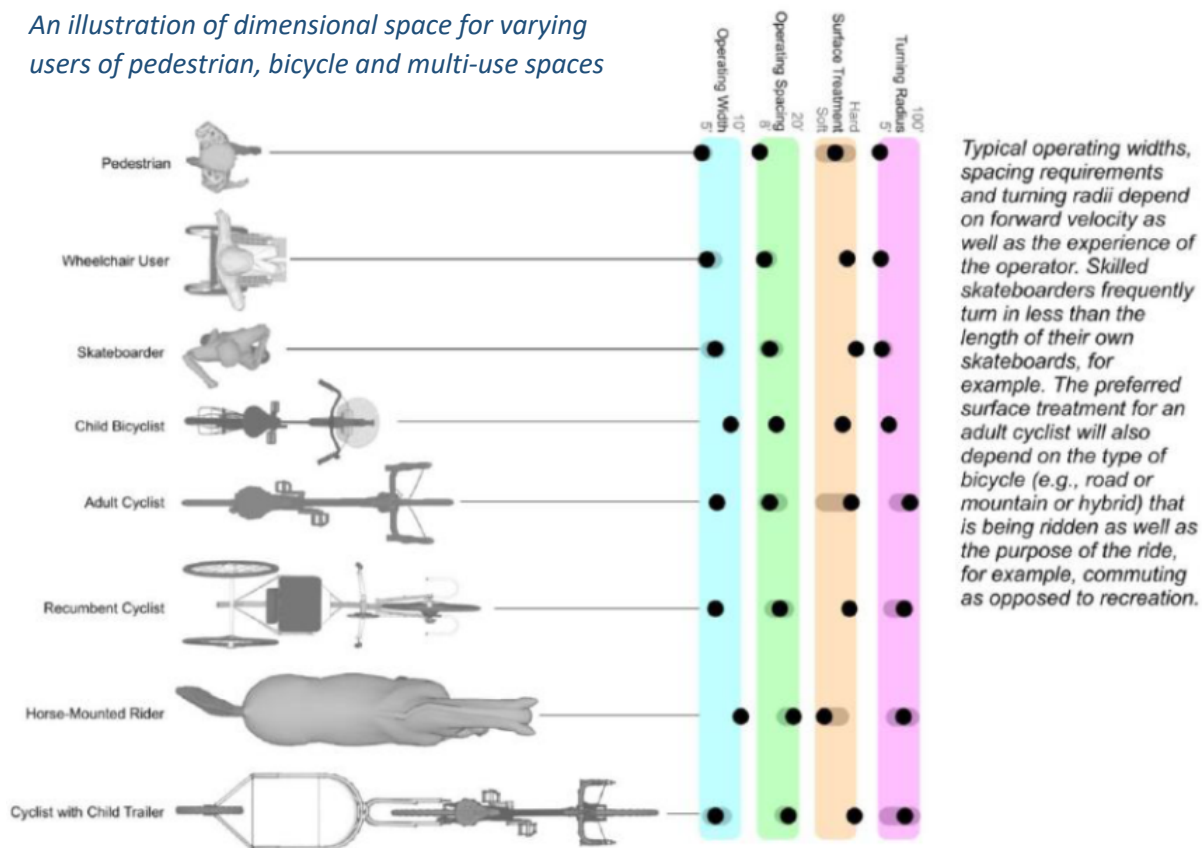


Illustration: J. Scott Lane