

# TRAFFIC AND SAFETY INFORMATIONAL SERIES

## FREQUENTLY ASKED QUESTION #12

### HOW ARE PEDESTRIAN SIGNALS TIMED TO ACCOMMODATE PEDESTRIANS?

Crossing a signalized intersection can be dangerous for pedestrians. It is important for an intersection with regular pedestrian traffic to have clearly visible signals that tell pedestrians when they should and should not cross the intersection. Pedestrian signals are especially necessary when pedestrians cannot see the green signal for the vehicles travelling in the same direction. In addition to the safety challenges that pedestrians introduce, the presence of pedestrians can greatly affect traffic signal timing. Understanding how pedestrian signals work is very important to pedestrian safety.

#### WHAT DO THE PHASES OF THE PEDESTRIAN SIGNALS MEAN?



When the “Walk” symbol (and optional countdown indication) is illuminated, a pedestrian may *start* walking across the intersection. The pedestrian should still check for potential conflicts with turning vehicles.



When the “Don’t Walk” symbol is *flashing* (and the optional countdown timer, if present, continues to run), it is *not safe* for a pedestrian to *start* crossing. However, a pedestrian who is already crossing when the symbol starts to flash should have sufficient time to safely finish.



When the “Don’t Walk” symbol is constantly illuminated (and the optional countdown indication is blank), it is *not safe* for a pedestrian to be in the crosswalk.

#### WHY DOES THE WALK SYMBOL STAY ON FOR ONLY A FEW SECONDS?

A common misconception that pedestrians have is that they should not be in the crosswalk when the “Walk” symbol changes to a flashing “Don’t Walk” symbol (including any countdown indication). When the “Walk” symbol changes, some pedestrians already in the crosswalk actually turn around and go back to where they started! Pedestrians should realize that the only time that they should not be in the crosswalk is when the “Don’t Walk” symbol is illuminated *constantly*. However, pedestrians *should not start* crossing if the “Don’t Walk” symbol (including any countdown indication) is flashing.

Most “Walk” phases last only about four to seven seconds and are normally referred to as the minimum start-up time for pedestrians. For pedestrians who have begun crossing during the “Walk” phase, the flashing “Don’t Walk” or countdown phase should provide enough time to safely cross the intersection.

#### HOW IS PEDESTRIAN CROSSING TIME RELATED TO PEDESTRIAN SIGNAL TIMING?

Transportation professionals use a simple equation to determine how much time is needed for a pedestrian to safely cross an intersection:

$$G_P = (4 \text{ to } 7) + (W/4.0),$$

where  $G_P$  is the minimum pedestrian crossing time needed in seconds. In general, the “Walk” symbol is illuminated for four to seven seconds (depending on the level of pedestrian flow). The flashing “Don’t Walk” symbol is illuminated for  $(W / 4.0)$  seconds, where  $W$  is the distance in feet from the curb to the center of the farthest lane on the roadway and the value of 4.0 (in feet per second) is the walking speed typically assumed for pedestrians. (A range of 3.5 to 4.0 feet per second is reasonable based on guidance and options from the *Manual on Uniform Traffic Control Devices* [MUTCD].)

There are also other methods for timing pedestrian signals. A common alternative to the previous approach is to install a pedestrian push-button detector. When the button is pushed, the traffic signal controller provides a minimum crossing time for pedestrians during the next available concurrent vehicle green phase. In the presence of pedestrians, the green time might be increased beyond what is needed for the vehicles during that phase and the percentage of the cycle allocated to the other phases decreased proportionally. In locations where it is assumed that pedestrians cross an intersection in two trips, pedestrian signal timing is based on the use of a median island. In locations with high volumes of pedestrians and conflicting turning vehicles, a leading pedestrian interval (LPI) may be used to reduce conflicts. This approach provides pedestrians with a walk indication three to seven seconds before vehicles are given a green signal to allow pedestrians to establish their presence in the crosswalk.

### **WHAT DETERMINES THE PLACEMENT OF A PEDESTRIAN SIGNAL?**

The safety of pedestrians crossing an intersection is very important. The MUTCD outlines several guidelines that address pedestrian safety at signalized intersections. The following are some of the basic conditions that stipulate the placement of a pedestrian signal:

- When warrants for pedestrian volume or school crossing require the installation of a traffic signal
- When an exclusive interval is provided or made available for pedestrian crossing
- At established school crossings at any signalized location
- When multiphase indications may confuse pedestrians
- When it is necessary to assist pedestrians in deciding when to begin crossing the roadway
- When traffic pattern indicators are not visible to pedestrians (e.g., one-way streets)
- When pedestrians cross only part of a street at a time (to or from a median island)