Pedestrian Signal Timing

THE CHALLENGE
Understand how the pedestrian “Walk” and “Flashing Don’t Walk” intervals should accommodate pedestrians of all ages with different characteristics, through role playing.

GRADE LEVEL
Older Elementary and Middle School

ACTIVITY DURATION
30 minutes

MATERIALS
Stopwatches

SET UP
This activity requires a signalized intersection with crosswalk and countdown displays.

ACTIVITY
1. Divide the students into groups of about 4 or 5 children.
2. Assign each student in each group a role to play, e.g., a small child, someone with a stroller, a runner, someone using a walker, a senior citizen, someone looking at his phone, etc. Talk to the students about how each role would affect how they cross the street – both how quickly they react to the “Walk” indication, and how quickly they move across the road.
3. Assign students from another group to use stopwatches to time each walker. Most smartphones have a stopwatch app; ensure the students know how to use it.
4. Have the first role-playing group start crossing the crosswalk while being timed. Have the timer start the stopwatch when their role-playing walker steps into the road, and stop it when their role-playing walker is completely on the other side of the road.
5. Record the amount of time it took each role-playing walker in the group.
6. Switch roles between groups and repeat the previous steps until you have several rounds of data.
7. Make note of the number of seconds the white WALKING PERSON is shown. If there is a countdown signal, make note of the number of seconds it starts with after the “Walk” interval is over.
8. Use a measuring wheel or Google Earth to measure the distance of the crosswalk, in feet.

FOR DISCUSSION
Talk to students about the how the pedestrian phase of a signal cycle consists of three intervals: “Walk” (the white WALKING PERSON); pedestrian clearance, commonly referred to as “Flashing Don’t Walk” (orange FLASHING HAND and countdown); and “Solid Don’t Walk” (orange STEADY HAND).

“Walk” Interval
The “Walk” interval typically begins at the start of the green vehicle interval and is used to allow pedestrians to react to the change to walk at the start of the phase and move into the crosswalk. This interval corresponds to the white WALKING PERSON indication on the pedestrian signal. You might mention to the students that it should probably be called the “Begin Walking” interval, as it is only on for a relatively short period of time at the beginning of the crossing interval.

The length of the “Walk” interval is usually established in local agency policy. The MUTCD (a federal guidebook on traffic engineering) indicates that the minimum “Walk” duration should be 7 seconds, but that a duration as low as 4 seconds may be used if pedestrian volumes are low or pedestrian

The “Walk” interval should provide pedestrians adequate time to perceive the white WALKING PERSON indication and depart the curb before the pedestrian clearance interval begins. It should be long enough to allow a pedestrian who has pushed the pedestrian push button to enter the crosswalk.
behavior does not justify the need for 7 seconds. Consideration should be given to “Walk” durations longer than 7 seconds in school zones and areas with large numbers of elderly pedestrians. In cases where the pedestrian push button is a considerable distance from the curb, additional “Walk” time is desirable. An excerpt from the MUTCD summarizing this information is presented below.

Discuss how the length of the “Walk” interval is determined to accommodate pedestrians with different characteristics across different ages. What all needs to happen between the time the “Walk” signal comes on, and the time the pedestrian steps into the road being crossed? (the pedestrian has to perceive and react to the “Walk” signal, the pedestrian has to get from where he/she is standing by the push button to the street) From the experience with your role-playing walkers, ask the students what they would recommend as a “Walk” interval for the intersection they just crossed.

“Flashing Don’t Walk” Interval
The “Flashing Don’t Walk” interval follows the “Walk” interval and is often accompanied by a countdown signal. It is used to alert pedestrians that they need to finish their walking maneuver, and if there is a countdown, it lets pedestrians know how long they have to do so. Its name can be confusing, because the orange FLASHING HAND of the “Flashing Don’t Walk” interval is the indication seen most of the time while you’re walking across the street!

The “Flashing Don’t Walk” interval must be long enough to allow someone who has just stepped off the curb to complete the crossing. The federal guidance for timing “Flashing Don’t Walk” intervals assumes a walking speed of 3.5 feet per second. The speed used for the calculation can vary from 3.0 to 4.0 feet per second based on the walking speeds of the people who routinely use the crossing.

Using the measured distance of your crosswalk and the federal guidance walking speed, how long should the “Flashing Don’t Walk” interval be at the intersection you crossed? Does that number match the number in seconds of the countdown timer when it started? (it should be close)

Calculate the walking speeds of the different types of walkers in your role-playing groups in feet per second. How do they compare to the 3.5 feet/second guidance? What are the benefits and downsides of assuming a walking speed that accommodates all users? (Pro: No one gets caught in the middle of the intersection when the signal turns green for an opposing vehicle movement. Con: There could be a lot of undue delay for vehicles that have to stop and wait for a conflicting pedestrian movement with no pedestrian in the crosswalk when, for instance, someone runs or rides a bike across it).

Have the students consider other methods of accommodating all the users at a crosswalk. See if they can come up with these: allowing pedestrians to request additional crossing time (an extended pushbutton press to extend the “Flashing Don’t Walk” interval); at intersections with a median, providing a pedestrian refuge area and a second ped pushbutton there. Maybe they will come up with a new idea!

Solid “Don’t Walk” Interval
The “Solid Don’t Walk” interval is shown when there is a protected vehicle movement that conflicts with the pedestrian movement.

**IMPORTANT:** It is crucial to have a conversation with the classroom teacher prior to performing the activity. This will aid in understanding the educational level of the class (for example, regular classes vs. gifted & talented or AP classes) which will help determine the appropriate level of difficulty of the materials and items for discussion.

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Walk Interval Duration (PW), s</th>
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<tbody>
<tr>
<td>High pedestrian volume areas (e.g., school, central business district, sports venues, etc.)</td>
<td>10 to 15</td>
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<tr>
<td>Typical pedestrian volume and longer cycle length</td>
<td>7 to 10</td>
</tr>
<tr>
<td>Typical pedestrian volume and shorter cycle length</td>
<td>7</td>
</tr>
<tr>
<td>Negligible pedestrian volume</td>
<td>4</td>
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<tr>
<td>Conditions where older pedestrians are present</td>
<td>Distance to center of road divided by 3.0 feet per second</td>
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