



Leading pedestrian interval/turn restrictions

Definition

Signal timing adjustments designed to minimize conflicts between pedestrians and motorists. The four major adjustments are:

- A leading pedestrian interval (LPI) provides pedestrians with a few seconds of lead time prior to the onset of the associated vehicle phase.
- Slower walking rates (2.5 to 3.5 feet per second) may be programmed at intersections with or without pedestrian signal heads to account for young children, mobility-impaired, or elderly pedestrians.
- A leading pedestrian interval (LPI) provides pedestrians with a few seconds of lead time prior to the onset of the associated vehicle phase.
- Lagging left turn provides pedestrian with a few seconds of lead time prior to the onset of a protected left-turn phase.
- Right-turn on red restrictions often improves pedestrian safety

Objective

To provide adequate crossing times or to minimize conflicts between pedestrians and motorists at signalized intersections.

Advantage

Low-cost.

Makes signalized intersections more pedestrian-friendly.

Reduces conflicts between pedestrians and turning vehicles.

Challenge

May increase signal cycle length and vehicle delay.

Can create safety problems for vision-impaired pedestrians, since the traffic surge sound may be mistaken for parallel through traffic or is delayed, which would diminish crossing time for vision-impaired pedestrians.

Resources

Manual on Uniform Traffic Control Devices <http://mutcd.fhwa.dot.gov/> (See Section 4E.06).

FHWA Pedestrian Safety Improvements — Countermeasures (RTOR Restrictions) <http://safety.fhwa.dot.gov/saferjourney/library/countermeasures/44.htm>.

Pedestrian and Bicycle Information Center — Signals and Signs <http://www.walkinginfo.org/engineering/crossings-signals.cfm>.

PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System http://www.walkinginfo.org/pedsafe/pedsafe_curb1.cfm?CM_NUM=41.

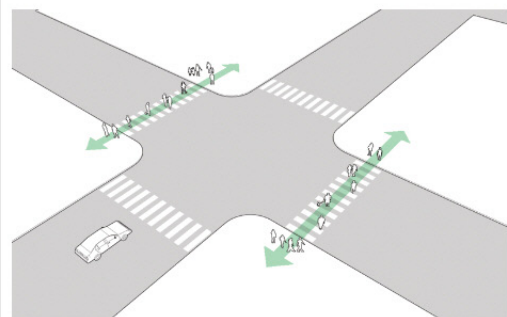
BIKESAFE: Bicycle Countermeasure Selection System (Turning Restrictions) http://www.bicyclinginfo.org/bikesafe/countermeasure.cfm?CM_NUM=20.

Selecting Leading or Lagging left-Turn Signal Phases for Coordinated Intersections http://www.academia.edu/1335226/Selecting_Leading_or_Lagging_Left-Turn_Signal_Phases_for_Coordinated_Intersections.

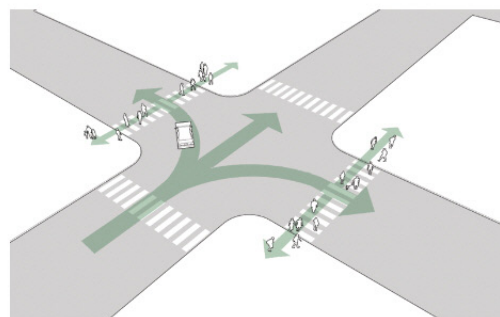
Chicago Pedestrian Plan (Tool Numbers 7 and 8, pp. 26-27) <http://chicagopedestrianplan.org/pedestrian-plan/>.

Streetsfilm.org video on LPI <http://www.streetfilms.org/lpi-leading-pedestrian-interval/>.

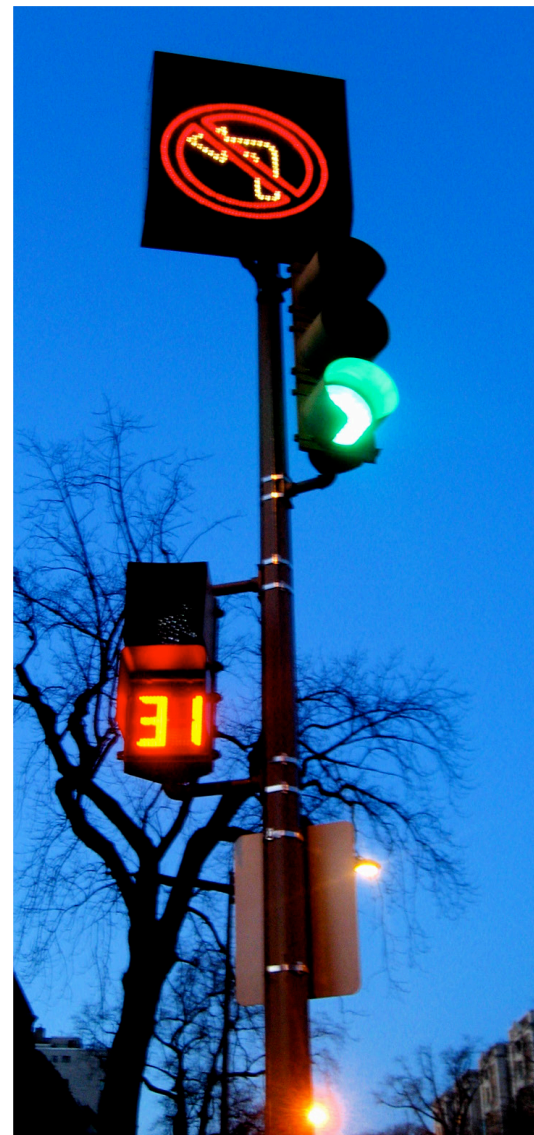
LPIs have been shown to reduce pedestrian-vehicle collisions as much as 60% at treated intersections.



Phase 1: Pedestrians only
Pedestrians are given a minimum 3–7 second head start entering the intersection.



Phase 2: Pedestrians and cars
Through and turning traffic are given the green light. Turning traffic yields to pedestrians already in the crosswalk.



Images (clockwise from main image):

Example of a leading pedestrian interval/turn restriction.
Source: Axleuk, Flickr.

Additional examples:
Sources: M.V. Jantzen, Flickr; Dylan Passmore, Flickr; William Yurasko, Flickr; National Association of City Transportation Officials (NACTO).