



NORTH CAROLINA
Department of Transportation

NCDOT Leading Pedestrian Interval Guidance

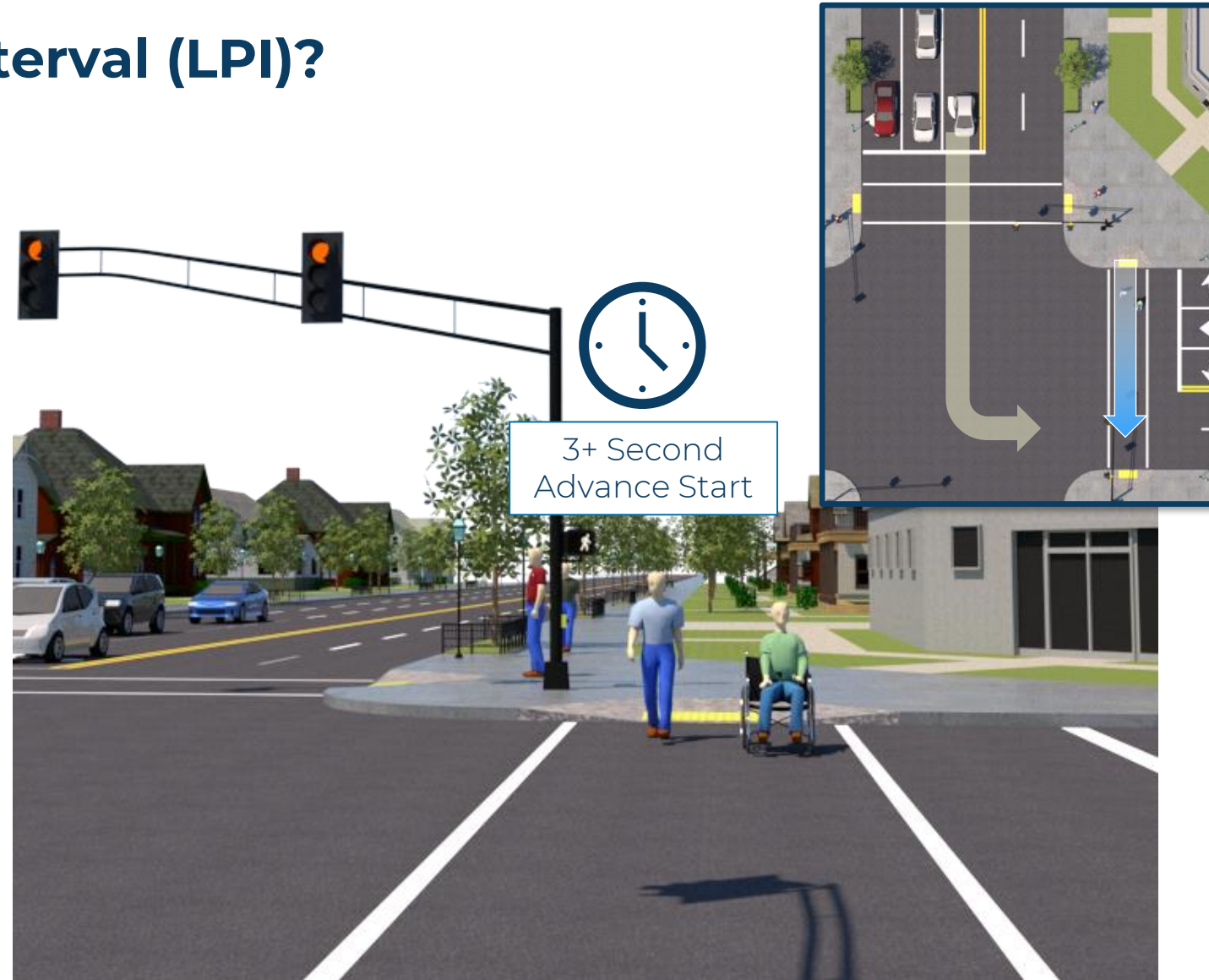
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What is Leading Pedestrian Interval (LPI)?

- Leading Pedestrian Intervals (LPI) is a low-cost adjustment to signal timing that give pedestrians a head start entering the crosswalk before vehicles in the parallel direction are given the green signal indication.
- LPI are typically set between 3 and 7 seconds, depending on the length of the crossing, pedestrian walking speed, number of travel lanes, and signal phasing.



NCDOT LPI Guidance

NCDOT created standards and guidance for the use of the Leading Pedestrian Interval (LPI) in North Carolina.

STIC Grant Award (FHWA, 2021)

“Innovating Pedestrian Safety in NC by standardizing the Leading Pedestrian Interval (LPI)”

NCDOT Adopts Traffic Signal Policy for Improving Pedestrian Safety



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When "leading pedestrian intervals" are programmed into signals like the one shown above, taken in March in downtown Raleigh, the "Walk" sign illuminates between three to seven seconds before the traffic light turns green, giving pedestrians an advanced start to safely proceed into the crosswalk.

What are the safety benefits to LPI?

- Crash reduction
 - Helps reduce conflicts with left and right turning vehicles
 - Improves driver yielding at crosswalks
- Improve visibility of pedestrians in crosswalk

Safety Evaluation of Protected Left-Turn Phasing and Leading Pedestrian Intervals on Pedestrian Safety (2018, FHWA)



LPI Guidance

Describes when and where to install LPI

- NCDOT requirements
- Implementation guidance (i.e., field conditions)
- Site-specific and additional considerations

Does not address...

- Software controller requirements or programming
- Signal design preparation
- How to conduct traffic analysis for LPI
- Developing cost estimates for LPI

New Standard

Implement at signalized intersections where all of the following conditions are existing, in design, or under construction at one or more approaches:

- Countdown pedestrian signal heads
- Pedestrian pushbuttons, where pedestrian phase is not automatic
- Marked crosswalks
- Accessible ramps at marked crosswalks
- Sidewalk on marked crosswalk approaches
- Supporting controller

LPI is reasonable to consider in areas with low or any level of pedestrian activity since LPI installation will typically include push button pedestrian actuation. In suburban areas, pedestrian activity and WALK phase/LPI actuation will have minimal impact on traffic operations.

Where to implement LPI first?

Prioritize LPI implementation at signalized intersections based on conditions such as:

- Moderate to high pedestrian activity
- Several nearby pedestrian generators
- K-12 schools or College / University Campuses
- Pedestrian crash history
- Trail crossings
- Light rail, Bus Rapid Transit (BRT), or high-frequency transit stop locations
- Vulnerable pedestrians
- Atypical locations with limited sight distance
- One-way and T- intersections
- Heavy turning movements in shared thru/left or thru/right lanes
- Public request

Resources for Implementing LPI

Signal Design Section

[NCDOT TMSD Design Manual for Signals Design: Part 1](#) (signal design changes including LPI)

[Design Manual for Signals Management: Part 2](#) (programming and timing application updates)

NCDOT Signal Inventory (2021)

FHWA resources

[LPI Tech Sheet: https://safety.fhwa.dot.gov/ped_bike/step/resources/docs/fhwasa19040.pdf](https://safety.fhwa.dot.gov/ped_bike/step/resources/docs/fhwasa19040.pdf)

[LPI Video: https://www.fhwa.dot.gov/exit.cfm?link=https://www.youtube.com/watch?v=BWzUkpgngGo](https://www.fhwa.dot.gov/exit.cfm?link=https://www.youtube.com/watch?v=BWzUkpgngGo)

LPI Guidance: Timeline

June 2021 – NCDOT receives FHWA grant to develop LPI guidance

July 2021 – Signal Design Manual updated to include LPI programming

Fall 2021 – Survey sent to local governments and NCDOT staff to learn about current implementation

March 2022 – Peer Exchange (Online)

October 2022 – Draft LPI guidance released & DTE presentation

2024– Post guidance to NCDOT website

Thank you!
