Complete Streets

Updating Iowa's Design Guidance

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Photo credit: Charlotte DOT

Need for Project

- Many road improvements designed without adequate consideration of other travel modes
- Guidance doesn't address how decisions can:
  - Encourage/discourage use by other modes
  - Impact the perceived and actual safety of a facility for bicyclists and pedestrians
- Existing complete streets guidance is limited or outdated

Project Timeline

- Idea submitted to/selected by Iowa Highway Research Board (IHRB) in 2019
- Awarded federal Statewide Transportation Innovation Council (STIC) Incentive program funds (80/20 match)
  - "…to support or offset the costs of standardizing innovative practices in a State transportation agency…"
- Work in progress (Toole Design Group)
  - Completion: Spring 2022

Project Goals

- Improve designs by updating guidance with:
  - State-of-the-practice information
    - Many new types of bicycle facilities and intersection treatments adopted and tested around the US
  - Design flexibility
    - Emphasize and encourage design flexibility that considers bicycling and walking as equal modes to driving
    - Present alternative methods for determining design speed at the beginning of a project (urban areas)

Project Goals

- Focus on contextual roadway sizing decisions:
  - Number of lanes
    - Potential to reduce # of lanes on new const. and 3R projects
  - Lane widths (urban areas)
    - Highlight flexibility in selecting lane widths (9-12 ft)
    - Narrower lanes can calm vehicle speeds
    - Options for buffered/separated bike lanes, wider sidewalks
  - Paved shoulder widths
    - Specify 4’ min. effective width

Project Goals

- Add specific details regarding FHWA's Safe Transportation for Every Pedestrian (STEP) countermeasures

National Design References

- AASHTO *Guide for the Development of Bicycle Facilities* (2012)
- AASHTO *Guide for the Planning, Design, and Operation of Pedestrian Facilities* (2004)
- FHWA *Separated Bike Lane Planning and Design Guide* (2015)
- ITE *Designing Walkable Urban Thoroughfares: A Context-Sensitive Approach* (2010)
- NACTO *Urban Street Design Guide* (2013)

Iowa Manuals Impacted

- SUDAS Design Manual
- DOT's Design Manual
- DOT's Location and Environment Manual
- DOT's Traffic and Safety Manual

Affected DOT Manual Sections

- Selecting Design Criteria
- Typical Roadway Cross Sections
- Geometric Design of Intersections
- Sidewalk Requirements
- Pedestrian and Bicycle Facilities
- Typical Pavement Marking Layouts
- Traffic Signal Design Considerations

FHWA's STEP Countermeasures

1. Crosswalk visibility enhancements
2. Pedestrian refuge islands
3. Raised crosswalks
4. Rectangular rapid flashing beacons (RRFB)
5. Pedestrian hybrid beacons (PHB)
6. Leading pedestrian intervals (LPI)
7. Road diets

Crosswalk Visibility Enhancements

- High-visibility markings
- Parking restrictions
- Curb extensions
- Improved lighting
- In-street YIELD signs

Crosswalk visibility enhancements can reduce crashes by

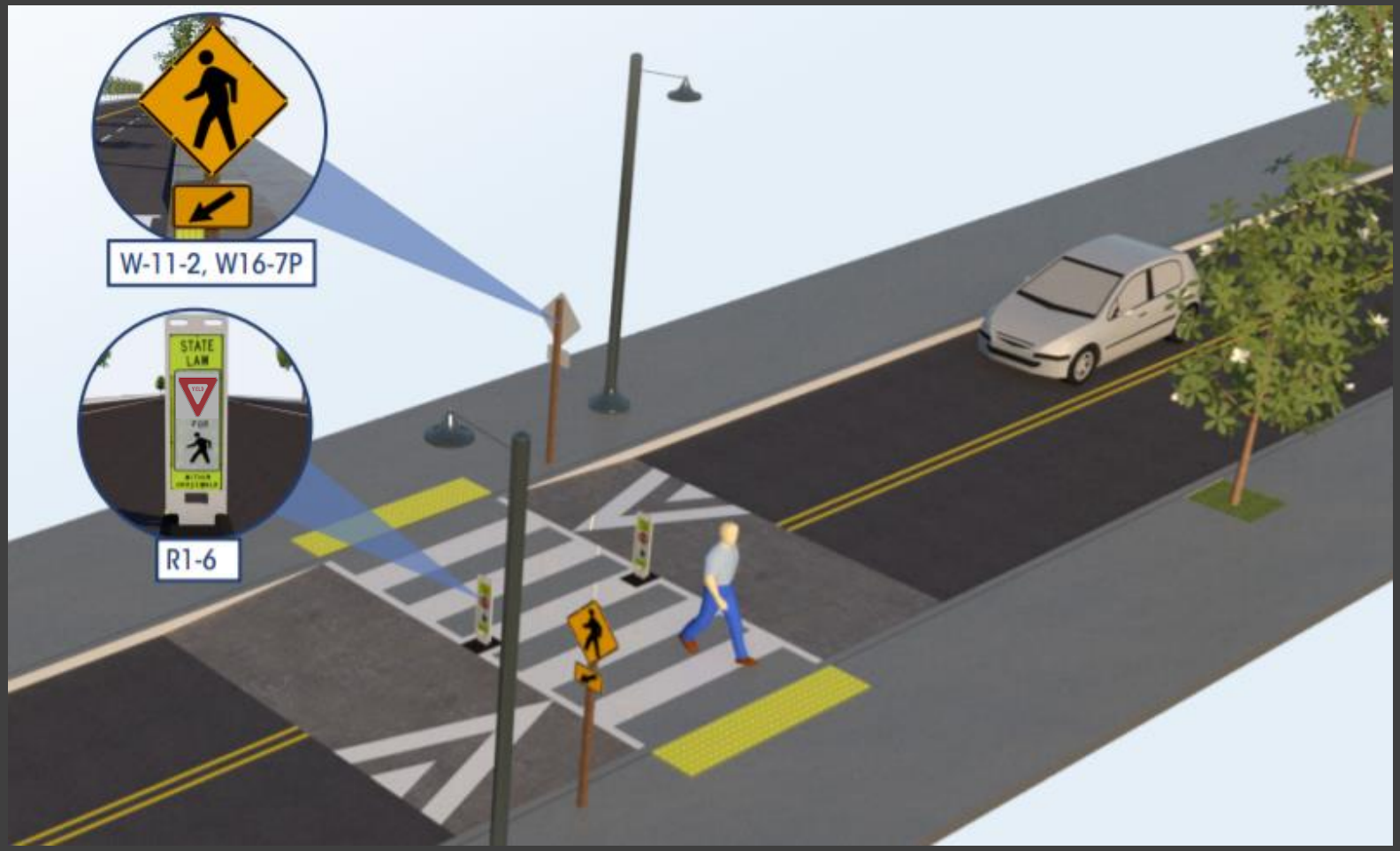
23–48%

Pedestrian Refuge Islands

- Enhanced visibility of crossing
- Lowers vehicle speeds
- Provides a place to rest
- Reduces exposure time

Pedestrian refuge islands can reduce pedestrian crashes by

32%



Raised Crosswalks

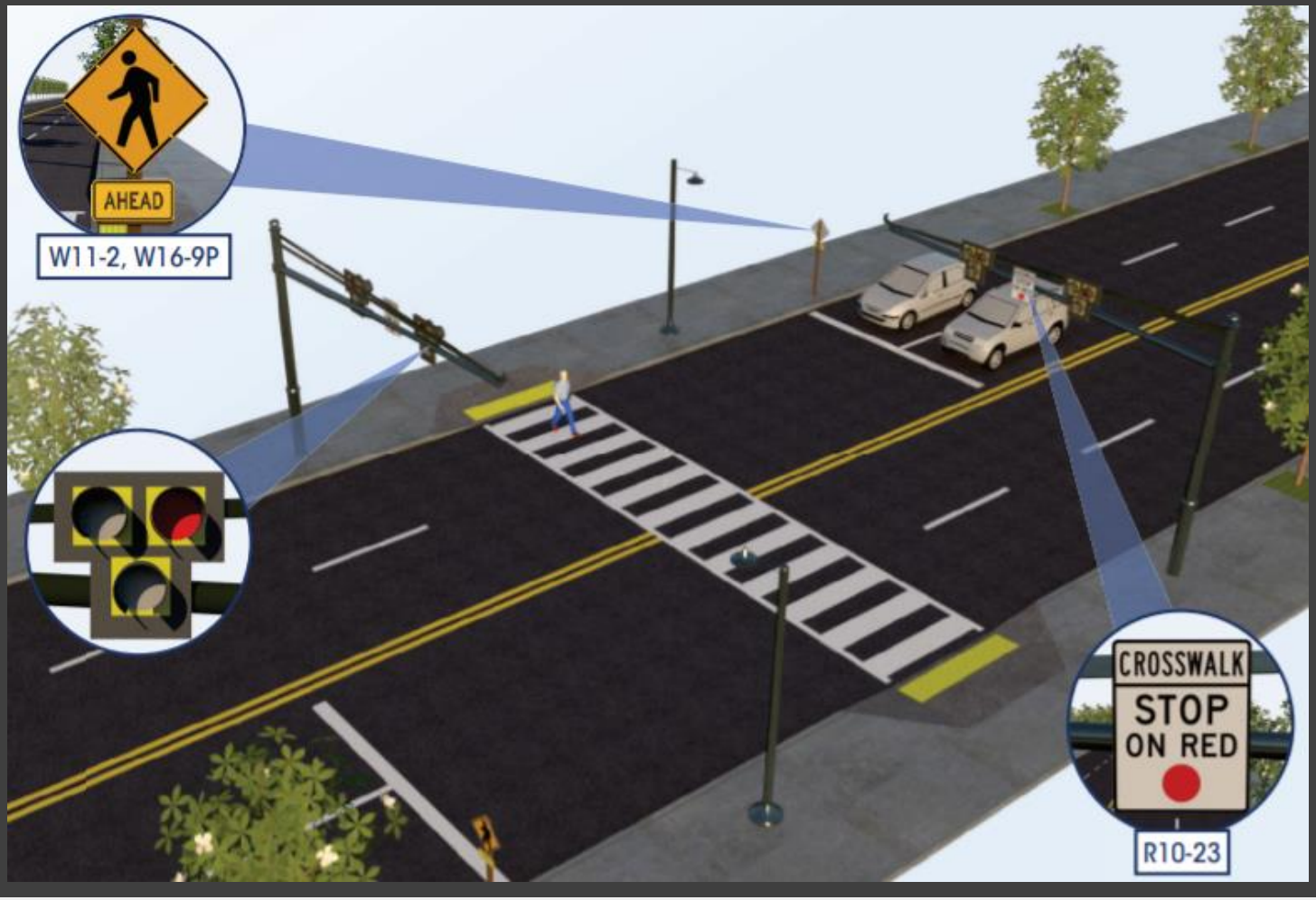
- Peds more prominent in driver's view
- Peds cross at-grade with sidewalk
- Reduces vehicle speeds
- Improves motorist yielding

Raised crosswalks can reduce pedestrian crashes by **45%**

Rectangular Rapid Flashing Beacons (RRFB)

- Pedestrian-activated
- Improves motorist yielding
- Most effective for speeds < 40 mph

RRFBs can reduce pedestrian crashes by **47%**



Pedestrian Hybrid Beacons (PHB)

- Beacons stop all traffic lanes
- Best for speeds > 40 mph
- Less expensive than full signal

PHBs can reduce pedestrian crashes by **55%**

Leading Pedestrian Intervals (LPI)

- Reduces ped/vehicle conflicts
- Improves visibility of peds in crosswalk
- Increased likelihood of driver yielding
- Safer for slower-moving peds

LPIs can reduce pedestrian crashes by[1]

13%

Road Diets

- Reduced crossing distance
- Reduced vehicle speeds
- Creates space for:
  - Bike lanes
  - Parking
  - Transit
  - Curb extensions
  - Wider sidewalks

Project TAC

(thank you!!!)

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Questions?