

# Evaluation of the Safety of Pedestrian Crossing Treatments in Small and Rural Communities

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## Motivation

Rural areas often lack adequate pedestrian infrastructure, resulting in elevated safety risks for pedestrians. The combination of higher speed limits and reduced driver awareness amplifies the potential for pedestrian collisions when crossing the roadway.

This study addresses uncertainty about the effectiveness of **rectangular rapid flashing beacons (RRFBs)** and **LED-embedded signs (LESs)** as potential safety interventions. RRFBs and LESs are both pedestrian crossing treatments that allow pedestrians to activate lights to alert drivers of their intent to cross. RRFBs include horizontal LED lights mounted to the sign pole, while LESs include LEDs embedded in the edge of the sign.

## Study design

The study uses a controlled before-after design to evaluate RRFBs and LESs in comparison to traditional crosswalks in Vermont's rural context. This robust study design captures the treatments' effects on outcomes while controlling for other factors that vary over time.

## Key Findings

**Treatment effectiveness:** RRFBs improve compliance and may improve safety-related outcomes in small and rural communities, while LESs only improve pedestrian compliance.

**Central versus transition zones:** Results are consistent across centrally located crossings and in rural to urban transition zones, where speeds drop as drivers enter a town center.

## Policy Implications

RRFBs can be implemented in rural areas to improve driver yielding, pedestrian compliance, and enhance pedestrian safety.

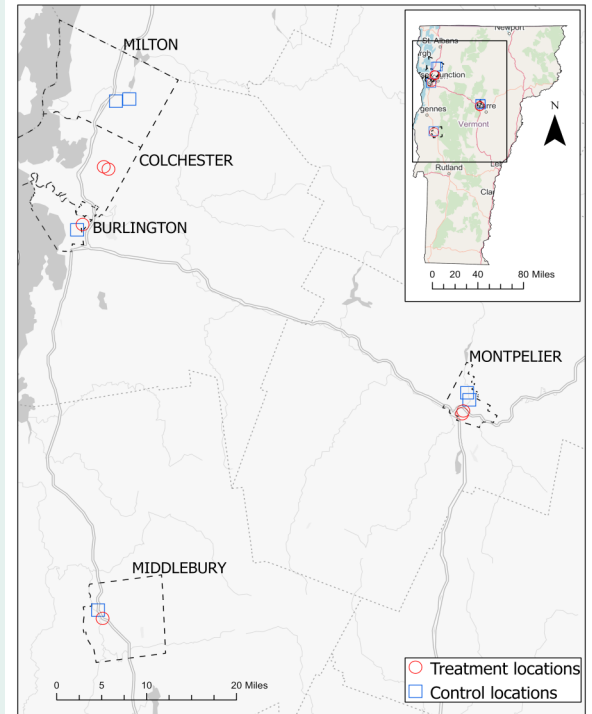
LESs were not found to be effective for improving compliance and safety in rural contexts.



RRFB



LES



Treatment and control sites

## Summary of effectiveness

| Outcome                 |  | RRFB        | LES     |
|-------------------------|--|-------------|---------|
| Compliance outcomes     | Driver-level yielding                      | Improve     | Worsen  |
|                         | Pedestrian wait time                       | May improve | Worsen  |
|                         | Pedestrian crosses out-of-crosswalk        | Improve     | Improve |
| Safety-related outcomes | Risky vehicle stopping position            | Unclear     | Unclear |
|                         | Vehicle stops suddenly                     | May improve | Unclear |
|                         | Pedestrian in roadway before drivers yield | Unclear     | Unclear |

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**Further reading** Pezeshknejad, P., & Rowangould, D. (2024). Evaluating safety and compliance of pedestrian crossings in rural contexts: A before and after study of RRFBs and LED-embedded signs. *Accident Analysis & Prevention*, 198, 107462. <https://doi.org/10.1016/j.aap.2024.107462>

