

## Kansas LTAP Equipment Loan Program Adds a Radar Speed Trailer for Traffic Calming

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This article describes the radar speed trailer available for use on Kansas local roads through Kansas LTAP's Equipment Loan Program at no cost. A speed trailer radar can be used as a traffic calming method to reduce vehicle speeds.

### Introduction

Radar speed trailers are mobile units placed on the side of the road that use radar to sense an oncoming vehicle's speed and display that speed back to the approaching driver, which gives the driver an external visual indication of their speed, so that if excessive, it may remind the driver to slow down. The changeable message part of the sign shows the speed of the approaching vehicle as "XX" in miles per hour. When a radar speed trailer is used to supplement a regulatory speed limit, a black on white SPEED LIMIT XX sign is installed immediately adjacent to the dynamic "XX" sign as shown in Figure 1 [1].

Radar speed trailers have no cameras to take photos of offending drivers for enforcement purposes [3]. The most prevalent conditions that can benefit from the deployment of these devices are the existence of chronic speeding issues and safety concerns. Examples include horizontal and vertical curves, work zones, school zones, or transition zones between high speed and lower speed roadways segments. Even though



Figure 1: Radar Speed Trailer (2)

they are not intended as an enforcement tool, a speed trailer can be used as an educational tool to enhance enforcement efforts directed at speed compliance [4].

### How Effective are They?

Studies have shown that speed trailers have a positive effect on reducing drivers' speed in work zones when workers are close to an open lane with high-speed traffic, and at curves when drivers do not readily recognize the need to slow down [1]. Radar speed trailers have been found to be especially when:

- The perception of regular enforcement and the threat of citation exists.
  - The sight distance is less than the decision sight distance.
  - One lane exists per direction.
  - Used with other information indicators of a need to reduce speed.
  - Used to support a regulatory speed limit.
  - The overall information system (for example, number of other signs) at the location does not overwhelm the speed display sign.
- Similar to traffic control devices, the overuse of radar speed trailers can reduce their effectiveness.

## How to Use Radar Speed Trailers

Radar speed trailers need to be used at the point of speed reduction in advance of roadway conditions that require speed reduction. It is recommended to deploy these devices on a tangent section of roadway between 500 and 2500 feet of the hazardous condition. For horizontal curves, installing them near a curve should be avoided to prevent their radar from incorrectly detecting an approaching vehicle's speed caused by the Cosine effect [1]. Cosine effect occurs with radar speed-measuring devices whereby the measured speed and the actual speed are related by a factor equal to the cosine of the angle between the centerline of the radar beam and the line of travel of the target vehicle [5]. Preferably, the angle needs to be zero degrees, which means vehicles are traveling directly at the radar beam.

Proper deployment ensures motorists have the best chance of seeing and reacting to the display. Best deployment provides the radar with a line-of-sight from 500 to 1000 feet, which allows sufficient time for the speed to appear on the display and for motorists to read and react to it. The trailer needs to be deployed in a way so it faces the near lane of approaching traffic and angled slightly toward the roadway [1]. In urban areas, radar speed trailers must be deployed on the side of the road away and safe from traffic, without blocking sidewalks or bicycle lanes, and without obstructing sight distance at

intersections and driveways. They must also be positioned in a way that not be blocked by parked vehicles [3].

## Pros and Cons of Using Radar Speed Trailers

Similar to any other intrusive devices used on roadsides, several advantages and disadvantages of radar speed-monitor trailers have been documented [3, 6-8].

Advantages are:

- Effective speed reduction measure.
- Set-up and removal can be accomplished quickly and easily.
- Low-cost deployment.
- It provides immediate results.
- It does not slow down emergency vehicles.
- Alerts violator motorists without affecting normal traffic.
- Can be used in various locations.
- Cost-effective speed control measure.
- Displayed speed is easier to read and attracts more attention.

Disadvantages are:

- Its effectiveness vanishes when removed.
- It requires appropriate space to set up, which may reduce available parking in urban areas.
- Its size, placement, and design affect its effectiveness.
- Subject to vandalism.
- Some risk-taker drivers may try to record a high speed.

The current cost of a radar speed trailer is about \$7,500. However, you can borrow one for free from Kansas LTAP, if you would like to try one out. For more information on the Kansas LTAP Equipment Loan Program or to request use of equipment, go to <https://kutc.ku.edu/equipment-loan-program>. This program has several types of equipment for loan to local agencies.

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## References

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