

## What to Consider before Installing Guardrail

Many local roads were first designed as farm to market roads. Features along the road may create potential dangers for drivers who leave the roadway. There are bridge piers, steep side slopes, non-breakaway signs, streetlights, and other features that create potential danger. According to the Insurance Institute for Highway Safety, the proportion of fatal crashes involving fixed objects has fluctuated between 19 and 23 percent since 1970 (AASHTO Roadside Design Guide 4<sup>th</sup> Addition).

Of these crashes, 48% of the fixed objects were trees. This is far and above the other types of fixed object crashes. However, it is interesting to note that 8% of fixed object crashes were attributed to the hitting of a traffic barrier (guardrail or end sections). Guardrail is still a roadside obstacle and therefore, should only be considered after other alternatives have been explored and determined to be not feasible.

### 1. The Obstacle

Obviously, as many of the local roads run through the forest; removing hundreds of trees is not always practicable nor desirable. However, there are other opportunities to remove obstacles from the “*Clear Zone*” (Rule of thumb 30 feet from roadway). For example, there are many irrigation risers that can be reset 30 feet from the traveled way. Also, one can work with utility companies to reset or underground utility poles away from the traveled way. The most important takeaway is to understand and work for a forgiving roadside; that is a roadside clear of obstruction and reduce the potential of a fixed object crash.

### 2. Redesign the Obstacle so it can be Safely Traversed

Many cross culverts for driveways and driveway cross slopes can be redesigned to allow an errant vehicle to traverse the obstacle and reduce the likelihood of an uncontrolled sudden stop and/or a roll over crash. This is just one example of redesigning existing conditions to be more forgiving.

### 3. Relocate the Obstacle where it is less likely to be Struck

Most runoff the road crashes that hit a fixed object are within 30 feet of the travelled way. As such, road designers strive to eliminate any obstacles within these 30 feet. This concept is called the clear zone. The actual clear zone varies based on speed, volume and roadside slopes; a good rule of thumb is 30 feet from the travelled way.

### 4. Reduce Impact by using Appropriate Breakaway Devices

There are larger signs that are on steel or wooden posts. If these posts are not designed correctly (breakaway), the posts can and do present a hazard to the motorist.

### 5. Shield the Hazard with Properly Designed Guardrail and End Sections

Again, guardrail is an obstacle, as such, the engineer needs to exhaust other options and should only consider guardrail if any of the above options are not appropriate.

### 6. Delineate the Obstacle

Finally, if none of the above can be completed, the obstacle can be delineated in an effort to make the driver aware of the potential hazard.

Guardrail is a very effective safety device and has saved many lives. It is understood that the guardrail is protecting a hazard that may have caused a fatal crash. The point of this paper is to have one consider all the above options prior to the consideration of guardrail installation. The guardrail should meet warrants as outlined in the Roadside Design Guide (AASHTO 4<sup>th</sup> Addition) and should be designed to be as far from the travel way as possible.