Rumble Strip Implementation Fact Sheet

BICYCLES

RUMBLE STRIPS AND BICYCLE ACCOMMODATION

Center line and edge line or shoulder rumble strips are extremely effective in reducing severe roadway departure crashes at a low cost. Rumble strips use both noise and vibration to alert the driver that he or she is leaving the appropriate travel path.

On undivided highways, rumble strips may be installed on the roadway shoulder or edge line and on the center line. The strategic placement of rumble strips, especially those on the shoulder or edge line, is important as practitioners balance safety effects for motorists and bicyclists.

There are several options for adjusting rumble strip dimensions, location, and offset that an agency can consider to better accommodate bicyclists. These options can be implemented through policy and through flexible design practices at specific locations. Modifying the design of a rumble strip may reduce its safety effectiveness for motorists. However, even a smaller, quieter rumble is more likely to improve safety along a corridor than no rumble at all. Bicyclists' safety is also a concern of transportation safety practitioners. Although the exact impact of rumble strips on bicycle crashes is unknown, we do know that rumble strips can negatively impact bicyclists' ability to ride if not properly mitigated.

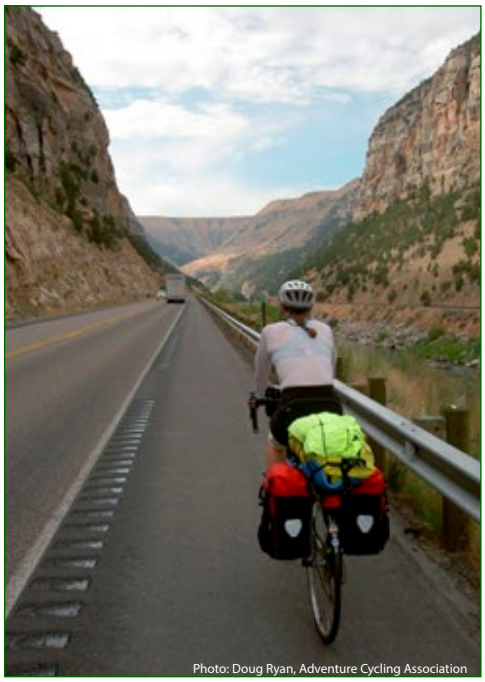
Photo: Doug Ryan, Adventure Cycling Association

Figure 1. Example of Bicycle Gaps

Important Issues to Consider

- Bicyclists are legal road users and have the right to use the roadway. Most bicyclists prefer to ride on a shoulder when it is available and well maintained.
- Rumble strips are uncomfortable to traverse on a bicycle and have the potential to cause a bicyclist to lose control.
- While AASHTO recommends at least 4 feet of paved shoulder remain beyond the outer edge of the rumble strip on shoulders used by bicyclists, this may not be the safest solution when considering the needs of all road users. Trade-offs are especially important to consider when installing rumbles as a safety improvement or during resurfacing, restoration or rehabilitation (3R) project.
- The best rumble strip application, design, and placement on one roadway may not fit the context of another roadway.
- Establishing a relationship with the bicycling community can help transportation agencies and bicyclists understand each other's needs and find solutions.

Effective Public Outreach and Messages

As with any highway project, safety and access for all road users should be considered and addressed as part of the project scoping and development. The installation of un-gapped edge line or shoulder rumble strips on two-lane, two-way roads has resulted in concerns from bicycling groups. A number of outreach efforts to the bicycling community and the general public have been used successfully by various States:

- Collaborate with one or two primary bicycle organizations (preferably face-to-face) prior to implementing a rumble strip program in a State or region and when making a major change to rumble strip installation policy or practice. Hearing and addressing the needs of all road users, to the extent practical, is important to this type of effort.

- Survey bicyclists' opinions of rumble strip design-related issues.
- Develop a public marketing campaign to educate the public on why rumble strips are used and how to react, recognizing the importance of engaging the bicycle community as part of the campaign.
- Explain that implementation is focused on types of roads where rumble strips will save the most lives, and that the agency will consider deviating from the standard rumble strip design or installation practice on routes with signficant bicycle use. Crash data, motorist traffic volume data, and bicycle traffic volume data can be useful in these conversations and the ensuing decisions.
- Create a "Share the Road" public service announcement to help drivers understand safe practices related to passing bicyclists where center line rumble strips exist.

Flexing Rumble Strip Design for Bicycle Accommodation

Standard agency practices will typically take into account bicycle accommodation and other concerns, but there may be unique locations, situations, or conditions that need to be assessed. Flexibility in design and application may be appropriate to optimize the safety for all road users.

Bicycle Gaps. Many States use a gap pattern within shoulder or edge line rumble strips so bicyclists can safely move between the shoulder and travel lane as necessary to avoid debris, make turns, pass, etc. Typical gap cycles use 10–12 feet gaps every 40–60 feet. These gaps are shown in Figure 1.

Offset. The most common design modification to accommodate bicyclists is the use of edge line rumbles instead of shoulder rumble strips, as shown in Figure 2. This treatment may also extend the life of the pavement marking and make it more visible during wet weather – especially in dark conditions.

Smaller Rumble Strips. An additional step that can provide much needed maneuvering space for a bicyclist where wide shoulders are not available is to change the dimensions of the rumble strips. Many agencies reduce their typical 16-inch or 12-inch length (rumble strip length is measured perpendicular to traffic flow) to 12-inches or 8-inches, and sometimes as narrow as 6-inches when necessary. Reducing the depth of the rumble strip may also reduce the jarring effect should a bicyclist need to cross the rumble strips. These choices are made with the understanding that reducing the dimensions can significantly reduce the alerting noise and associated safety effectiveness of the rumble strip for motorists.

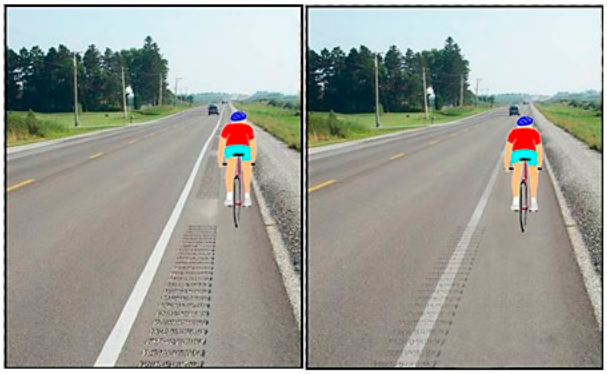

Figure 2. Illustration of Shoulder Rumble Strips (left) vs. Edge Line Rumble Stripes (right).

FOR MORE INFORMATION

The following resources contain more details related to bicycles and rumble strip use and design:

- ✓ **FHWA-SA-035: Rumble Strip Implementation Guide: Addressing Bicycle Accommodation Issues on Two-Lane Road.**
- ✓ **FHWA's Rumble Strip Website: http://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/.**
- ✓ **NCHRP Report 641: Guidance for the Design and Application of Shoulder and Centerline Rumble Strips. http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_641.pdf.**
- ✓ **AASHTO's Guide for the Development of Bicycle Facilities, 4th Edition: https://bookstore.transportation.org/item_details.aspx?ID=1943.**