

To: Seth Cutter, Caltrans District 11 Bicycle and Pedestrian Coordinator

From: Karl Rudnick

Date: June 4, 2015

Subject: Rumble Strips on Caltrans Roads Affecting Cyclists' Safety

Overview

I have noticed the use of rumble strips on Hwy 76 in North County in a couple of areas which affects safe bicycling.

There are nice bike lanes on the western portion of Hwy 76, running between Guajome Lake Rd on the east and Fousat Rd on the west. Unfortunately, rumble strips have been installed *inside* the bike lane on the last couple of westward miles of these lanes, between Rancho del Oro Dr on the east and Fousat Rd. They come up unexpectedly and nearly caused a personal crash riding in the dark and rain during a cycling event. There should never be rumble strips in the interior of a bike lane. They also should not cross any part of the bike's path as you approach intersections, which is currently the case at a couple intersections where the rumble strips continue as cyclists move left for a bike lane continuation at intersections with right turn pockets. The rumble strips often run right through the "B" and "L" of the "Bike Lane" marking. If Caltrans can justify the use of rumble strips in this area, they should be set outside the bike lanes with signage and/or paint to clearly warn the cyclist where they are, in both daytime and nighttime and all weather conditions. Since resurfacing of Hwy 76 east of Rancho Del Oro Rd will be occurring soon, we request that **no rumble strip hazards** be placed in the resurfaced new bike lanes.

More distressing is the recent introduction of rumble strips on both sides of Hwy 76 over a much more rural section, which extends from the Valley Center Rd intersection eastward for about 2 miles. This is the beginning of the highly popular, iconic climb of Mt. Palomar, a favorite for local cyclists and often the single most anticipated ride of visitors from all over the world who come to San Diego County for the spectacular cycling we have to offer. Every cyclist I've spoken to who has encountered these new treatments, without exception, has "grumbled over the rumbles." I know of no serious accidents to date, fortunately, although on May 31 a downhill cyclist inadvertently hit the rumble strips and the vibration resulted in the loss of an expensive GPS bike computer, not to mention his arriving at the bottom of the descent badly "shaken." Some photos are provided below, which show these rumble strips are not only located in places which create new danger for cyclists, but are clearly against published Caltrans policy for use and placement of rumble strips in the shoulder. It is the hope of all cyclists that these new rumble strips are largely an error on Caltrans' part and that there is a remedy to remove them or rework them for conformance with Caltrans policy. We would like to emphasize that further continuation of these rumble strips over this well-traveled cycling route is **not acceptable**. There could even be economic impacts if visiting bicyclists stopped coming to San Diego County for bike riding because of ubiquitous rumble strip application here and across the county.

Caltrans Policy and FHWA Excerpts

To summarize some key points provided by Seth Cutter in References [1,2,3] regarding Caltrans standards and recommendations regarding rumble strips, a few quotes are included here. Note that Caltrans has adopted standards that are more forgiving for bicyclists than FHWA recommendations and those in other states (New Mexico in particular), which we think is good news. Current Caltrans standards are:

"In 2001, Bucko evaluated milled in and rolled in rumble strips for the California Department of Transportation (Caltrans) to determine a design that was effective in preventing run-off-the-road crashes while being bicycle friendly (8). As the result of instrumented and subjective testing at Caltrans' West Sacramento test facility, the report recommended that rumble strip dimensions should be changed from the existing (2001) design. This included changes to a length of 12 inches (B), a **width of 5 inches** (C), and a depth of 0.3125 inches (D). Additionally, it was recommended that **a 5 foot shoulder should be present**

before installation of rumble strips is considered in order to accommodate bicycles. The report also stated that the use of rumble strips should be continued over bridge decks. This design standard so far has the shallowest depth shoulder RS application while still providing adequate vibration and noise feedback to the driver. Some data showed that larger trucks and trucks with trailers may not have adequate noise/vibration at the shallower depth to alert a larger vehicle driver, but the impact to bicycles amongst those who participated in the research was minimal, as this depth was by far the preferred depth amongst those who actually tested the placed rumble strips.”

The recommended depth of 0.3125 inches is shallower than FHWA and other states (0.375 inches).

Also of importance is that there should be gaps in the rumble strips to allow bicyclists to leave the shoulder to avoid obstacles and pass slower moving bicyclists.

“A November 2011 FHWA Technical Advisory provided updated information and guidelines for the design and installation of shoulder and edgeline rumble strips (54). The Advisory documented that milled in, raised, rolled in and formed types of rumble strips were all in use at the time. The most commonly cited edgeline and shoulder rumble strip dimensions cited in literature were 16 inches length (B), 7 inches width (C), and 0.50 inches depth (D). Edgeline and shoulder rumble strips with a narrow offset (A) (less than 9 inches) from the edgeline have been found to be the most effective placement location. To accommodate all road users, a paved shoulder at least **four feet beyond the rumble strip edge (I)** was recommended., or the use of narrower edgeline RS were recommended. **Gaps for bicycles of 10 to 12 feet (G)** should be provided at **40 to 60 foot intervals**. The use of edgeline or shoulder rumble strips was recommended systemwide on rural freeways and highways with speed limits of 50 mph or greater, as well as on corridors with a history of run-off-the-road crashes.”

Finally, Highway Safety Improvement Program countermeasures to reduce *roadway departure collisions* are evidently the status quo at Caltrans, and the non-installation of countermeasures requires a “no action” recommendation. From Caltrans Headquarters:

“NOTE: Since the RDSIP is recommending countermeasures to reduce roadway departure collisions, a “**no action” recommendation must** be documented with justifiable reasons why that countermeasure **should not be installed** or completed. A discussion with Headquarters and/or your Liaison is required before the District Report is sent back to headquarters.”

Where rumble strips limit bicyclists’ safety, perhaps ***other countermeasures*** besides rumble strips could be applied in areas where shoulder width or other restrictions cannot be met to avoid a formal “no action” recommendation. The task of documenting all areas where bicyclists do not want rumble strips is made difficult by this policy, and it makes it easy for their installation without input from the bicycling community.

Rumble Strip Details on Hwy 76 Bike Lanes

Rumble strips are actually placed **within** the bike lanes on Hwy 76 between Rancho Del Oro Dr on the east and Foussat Rd on the west. The first photo shown here is on the eastbound side and shows 12" rumble strips placed about 6" inside the bike lane stripe. The rumble strips even run through the "B" and "L" of the Bike Lane signage. At night, and in wet weather, the cyclist cues on the "Bike Lane" white letters, cannot even see the rumble strips, and when they are encountered creates a hazardous situation, which becomes worse with speed. The rumble strips are barely visible and a bicyclist encountering them unexpectedly while in a supposedly safe bike lane risks a serious accident when control is lost.

Note that Hwy 76 east of Rancho Del Oro Dr is under construction, with a full resurfacing imminent. Since Caltrans is put on notice here, we expect the resurfaced bike lanes will not contain these rumble strip hazards.



Rumble strips should have gaps in areas where bicyclists are expected to ride in order to maintain the safest position in the roadway. In this second photo of a Hwy 76 westbound bike lane approaching a right turn pocket at Foussat Rd, note that the rumble strip in the bike lane continues without gaps to the right of the edge stripe all the way up to the right turn. Meanwhile, in the distance the bike lane picks up to the left of the right turn pocket as it should. The only way that a cyclist traveling west through the intersection at Foussat Rd to continue into the bike lane ahead is to cross the rumble strips, which is even more unsafe as the crossing is at a non-perpendicular angle.

West of Foussat Rd, where the bike lane becomes the shoulder of a Class III Bike Route, this hazard at right turn pockets continues. There are no gaps in the rumble strips along the right turn pocket edge stripe and a through cyclist must cross the rumble strip hazard in order to continue westward.



Rumble Strip Details on Mt. Palomar Route

The first photo shown here is on the eastbound, uphill side of Hwy 76, near the start of the rumble strip treatment. These rumble strips are at least 12" wide (not the recommended 5-6") and are offset 3"-4" right of the edge line and the shoulder width is less than 3 feet, leaving a very narrow area for cyclists to ride to the right of the rumble strips. There are NO gaps – recall FHWA guidance of 10'-12' gaps every 40' to 60' on bicycle routes. If the reason for no gaps is that there are no Class III bicycle *route* signs in this area, then perhaps that should be considered. However, it cannot be argued that this is not a popular bicycling route. The depth of the rumble strips was not measured. The best safe place to ride now is **left of the shoulder stripe**.



The second photo shows the same segment on the westbound, downhill side. Downhill bicycles speeds over 30 mph usually require the bicyclist to control the lane as riding in a narrow shoulder at high downhill speeds does not allow for safe hazard avoidance, which would require sudden swerves into the lane. By controlling the lane, it is clear to motorists that they must either pass the cyclist or wait patiently until the cyclist can find a safe place to move aside if multiple vehicles are being held up – a rare occurrence on the downhill side as the curved sections require motorists to travel at nearly the same speed. Nevertheless, a cyclist may inadvertently cross the right of the edge stripe, or he/she may be just riding too far right. It obviously would be suicidal to ride downhill to the right of the rumble strips as there is only 18"-24" riding width. Hitting those downhill rumble strips at **high speed is much more dangerous** than on the eastbound uphill side, where speeds are much slower in the 5(amateur)-15(pro) mph range.



The third photo shows a segment with typical shoulder width, which is what most of the 2 miles on the uphill stretch now looks like. Note that there is very little room now to ride right of the rumble strip, where previously cyclists would sometimes ride two abreast. There are no gaps in the rumble strip treatment and the **safest place to ride is to the left of the shoulder stripe**, which is legal because, with 12' lane widths, these are sub-standard width lanes (i.e. too narrow to safely share side by side with motor vehicles).



Finally, here is a photo of a stretch with a fairly wide 4'-5' riding area to the right of the rumble strips. There are only a few stretches like this of a couple hundred yards each at most. In the photo, this is a stretch with a 9% gradient, and cyclists are typically climbing this at different speeds, requiring faster cyclists to move left to pass the slower cyclists. Since there are no gaps in the rumble strips as recommended, this is either impossible or the faster cyclists must simply cross the rumble strip to make the pass, meaning the rumble strips are crossed twice, on each side of the pass. For the whole, approximately two mile stretch with rumble strips, there are just three to four breaks in the rumble strips eastbound and westbound each, all to accommodate driveways and/or turnouts. There are **no frequent gaps as recommended for cyclists**.



Summary

Caltrans has created a hazardous condition by installing these rumble strips on Hwy 76 in violation of its own guidelines. Both cyclists and motorists have reduced safety when cyclists cannot position themselves in the safest position on the road without risk of encountering rumble strips, which are unnecessary obstacles placed in the cyclist's path that restrict safe lane movements around road hazards and other cyclists. These **new hazardous conditions** are **unacceptable** and we ask that Caltrans provide a solution to **remove them**.

The policy from Caltrans Headquarters hints that the use of rumble strips is now becoming commonplace with little thought to their placement. Bicyclists find it disconcerting that their safety is put at risk to protect vehicle drivers who have difficulty staying on the road, the presumption being that they are either poor drivers, distracted, sleepy, or driving under the influence. The bicycling community suggests that the use of rumble strips be limited to areas where constraints of the roadway design make it necessary to add an additional countermeasure against roadway departure collisions which could possibly occur for unimpaired drivers.

Would it be possible for Caltrans to seriously factor in bicyclists' safety for all installations of rumble strips? Can alternative countermeasures be used instead of rumble strips on rural roads? It would be better if Caltrans policy were to only install countermeasures (especially rumble strips) for roadway departure collision avoidance only where a study shows it would improve safety, instead of having a policy which only requires documentation to **not** install countermeasures of any type. A Bicycle Advisory Group, consisting of experienced cyclists, would be useful to help the non-cyclist personnel at Caltrans, District 11 make decisions on roadway design and treatments that affect bicyclists' safety. We have heard that other Caltrans Districts rely on such advisory groups and the San Diego County Bike Coalition would like to take the lead on that if one could be formed.

Thank you for your consideration,

Karl Rudnick
North County Cycle Club Ride Leader
San Diego County Bike Coalition Member
BikeWalkSolana Active Transportation Advisory Committee Member

References:

1. "Guidelines for Installation of Rumble Strips," CA DOT Policy Directive TR-0011 (Rev 9/2006), October 5, 2011 (Caltrans-RumbleStrip-PolicyDirective-October-2011.pdf)
2. "Roadway Departure Safety Implementation Plan (RDSIP)," Memorandum from James R Anderson, June 11, 2012 (RDSIP_Cover_Memo-June-2012.pdf)
3. "Roadway Departure Safety Implementation Plan (RDSIP) - Addendum," Memorandum from Thomas Schriber, June 10, 2013 (RDSIP-Addendum-June-2013.pdf)