

**North Carolina Department of Transportation  
Division of Highways  
Transportation Mobility and Safety Division**

**STANDARD PRACTICE  
for  
Milled Rumble Strips/Stripes on Non-Full-Controlled Facilities  
At Locations with Documented Lane Departure Crash Issues**

It will be the standard practice of NCDOT to consider rumble strips/stripes at locations on partially controlled or non-controlled facilities that have a documented pattern of treatable lane departure events based on an engineering study and investigation. Rumble strips/stripes have proven to be an effective, yet low cost, safety countermeasure to address lane departure events resulting from drowsy or inattentive motorists. All rumble strips/stripes shall be installed, marked, and signed in compliance with the Manual on Uniform Traffic Control Devices (MUTCD), the North Carolina Supplement to the MUTCD, the NCDOT Roadway Standard Drawings, the NCDOT Roadway Design Manual, and the standards herein. The State Traffic Engineer shall approve all deviations from this practice with coordination from other units.

The purpose of this standard practice is to provide guidance on accommodating the movement of bicycles on facilities where they are legally allowed to operate. However, this standard practice should not prevent the installation of rumble strips/stripes at locations where there are lane departure events, and it is not justification to place continuous rumble strips/stripes on facilities that bicycles are legally allowed to operate.

**CRITERIA**

The following is general criteria for the installation of milled rumble strips/stripes:

- Rumble strips/stripes should be installed on both sides (right and median shoulders) of facilities designated as expressways.
- Rumble strips/stripes should be considered on other facilities where an NCDOT engineering study and investigation determines that lane departure events exist and other safety countermeasures are not deemed feasible or cost-effective to address these events.
- The design of all milled rumble strips/stripes shall conform to the NCDOT Roadway Standard Drawings (665.01).
- Centerline rumble strips/stripes and other similar treatments should be considered on a case by case basis.
- The desired minimum width of shoulder rumble strips/stripes is 12 inches.

- The beginning of a rumble strip/stripe pattern should be delineated in accordance with MUTCD criteria (Section 9C.06) on any facility that bicycles are legally allowed to operate.
- The NCDOT Division of Bicycle and Pedestrian Transportation will be provided an opportunity to comment on any project implementing rumble strips/stripes on facilities subject to this practice.
- Turn bay rumbles may continue to the beginning of the full width lane, if the paved shoulder width remains the same as the through-lane shoulder width.
- NCDOT recognizes and is sensitive to the fact that noise may be an issue. However, if there is a documented safety problem where no other reasonable cost effective solution is available then rumble strips should be installed. This approach has been supported through other Departmental actions.

### **CONSIDERATIONS FOR BICYCLE TRAFFIC**

The following should be considered for all facilities where bicycles are legally allowed to operate:

- It is desirable to provide a nominal width of four (4) feet of useable shoulder between the outside edge of the shoulder rumble strip/stripe to the edge of pavement. However, even though a four foot nominal width is desired, it will not preclude the installation of a proven safety countermeasure where there is the presence of treatable lane departure events. Also, the condition of the shoulder itself should be considered in determining whether or not to provide the four foot nominal riding width for bicycle traffic.
- The width of shoulder rumble strips/stripes may vary between 8 and 16 inches. The engineer should determine design and placement.
- Gaps in milled patterns, varying between 6 and 12 feet, may be provided to allow bicyclists to move between the through lane and the right shoulder to avoid vehicles, debris, etc., but the pattern should be a minimum of a 5:1 rumble-to-gap ratio. The Engineer should determine design and placement.
- No gaps should be provided on the left (median) side of divided highways. Gaps should not be provided on interstate or freeway facilities.
- Consideration should be given to the alignment of the roadway in the direction of travel from the perspective of bicyclists.
- Consideration should be given to the grade and speed at which bicyclists may be traveling.