




# Memorandum

Subject: **ACTION:** State Guidelines for Cable  
Median Barriers

Date: APR 25 2016

From: Michael S. Griffith   
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In Reply Refer To:  
HSST-1

To: Division Administrators  
Directors of Field Services  
Federal Lands Highway Division Directors

**Purpose:** To address Recommendation H-15-41 issued by the National Transportation Safety Board (NTSB) to the FHWA and to clarify cable barrier crash test criteria in the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware.

**Action:** Please share this information with your State partners and ask them to review this information in light of their own guidance on the use of median barriers on high speed divided highways.

**Background:** The Board has issued numerous recommendations regarding the use of median barriers on divided highways. In its investigation of a cross-median crash in Davis, Oklahoma, the NTSB recognized the Oklahoma Department of Transportation's median cable barrier guidelines as more advanced than those in the AASHTO Roadside Design Guide (RDG) or those in use by most State departments of transportation. The Board recommended the FHWA share this information with the States.

Disseminate information to the State departments of transportation about the [circumstances of the Davis, Oklahoma, crash](#) and the Oklahoma Department of Transportation revised median cable barrier guidelines that resulted in the installation of a median cable barrier at the crash site. (H-15-41)

The Oklahoma median barrier guidelines are included as Attachment 1 to this memorandum.

The Board notes that certain States, including Oklahoma, have developed more advanced guidelines for the installation of median cable barriers to reduce crossover crashes and fatalities. Such guidelines and the circumstances of the Oklahoma crash can provide critical information in the development of comprehensive State or national guidelines for the installation of median barriers. The Office of Safety recommends that States review the attached Oklahoma Median Cable Barrier Guidelines as one example of expanding

the guidance in the RDG. Additional factors that may be considered are included as Attachment 2.

The NTSB also reiterated the following two recommendations regarding median barriers.

Work with the AASHTO to identify cross-median crash rates that call for special consideration when selecting median barriers. (H-11-22)

Work with the AASHTO to define the criteria for median barrier selection, including heavy vehicle traffic volume. (H-11-23)

The NCHRP Project 22-31, titled, "Recommended Guidelines for the Selection and Placement of Test Levels 2 through 5 Median Barriers" is expected to provide additional guidance covering these topics but will not be completed for another 3 years. The FHWA has worked closely with the AASTHO Technical Committee on Roadside Safety in support of NCHRP Project 22-31 which will look at cross-median crash rates as well as barrier test levels for heavy vehicles. States should examine their crash record system to ensure that cross median crashes can readily be identified through their crash database. This will aid development and deployment of new barrier guidelines in the future.

If you have any questions or comments, please contact Nicholas Artimovich in the Office of Safety at (202) 366-1331.

2 Attachments

## Oklahoma Median Cable Barrier Guidelines

The Oklahoma Department of Transportation adopted its median cable barrier guidelines on October 28, 2014. The first stage contains the following seven requirements, each of which should be met to begin considering a median cable barrier at a particular location:

- Posted speed limit of 55 mph or greater.
- At least two through travel lanes in each direction of travel.
- No existing barrier in the median, except short overlaps at transitions or where the existing barrier protects a fixed object.
- All cable barrier median openings located not less than 0.4 mile from each other and from any interchange overpass or underpass.
- No uninterrupted length of cable barrier longer than 2 miles without a median opening or interchange overpass or underpass permitting crossing of the median by emergency vehicles.
- An achievable 6:1 median cross slope, unless cable barrier is to be placed on both sides of the median.
- At least 0.2-mile uninterrupted length of any median cable barrier installation.

The second stage of requirements consists of four primary guidelines:

- Guideline 1 (Controlled Access):** (1) All fully controlled access highways with a median width of 80 feet or less; (2) all partially controlled access highways with annual average daily traffic (AADT) of 3,500 vehicles or greater and a median width of 80 feet or less.
- Guideline 2 (Crash History and AADT):** The entirety of any portion of a highway, not less than 1 mile, with substantially similar characteristics of traffic flow, speed, median width, access density, terrain, and geometrics, within which 0.23 or more crossovers per mile have occurred within a 5-year period, and having an average AADT of 10,500 vehicles or greater.
- **Guideline 3 (High Speed, Narrow Median):** Any highway with a speed limit of 65 mph or greater, AADT of 3,500 vehicles or greater, and median width less than 35 feet.
- Guideline 4 (Gaps):** Any portion of highway up to 1 mile long, adjacent to a portion of the same highway that is provided with median cable barrier,

which has substantially similar characteristics of traffic flow, speed, median width, access density, terrain, and geometrics.

Meeting any one of these second-stage requirements could justify the installation of a median cable barrier as long as that highway segment also meets *all* of the first-stage requirements.

Each State should have design guidance for median barrier selection and placement on all divided highways. That guidance may consider the following factors:

- Traffic
  - Speed\*
  - Volumes\* or Highway Functional Classification
  - Truck percentage
- Geometry
  - Median width\*
  - Spacing of crossovers, intersections\*\* or other gaps in the barrier
  - Median slopes / grading
- Level of access control
  - Fully controlled access
  - Partial control, or uncontrolled access \*\*\*
- Crash history\*\*\*\*
  - Overall crashes
  - Cross median crashes
  - Run-off-road into median (non-crossover)
  - Crash proximity to interchanges or intersections
- Barrier type\*\*\*\*\*
  - Flexible (cable, weak-post w-beam)
  - Semi-rigid (MGS, strong post w-beam, weak-post box beam)
  - Rigid (F-Shape, Constant Slope)

\* Guidance on design speed, median width, and traffic volume is in the AASHTO Roadside Design Guide, Chapter 6.

\*\*Sight distance over or through median barriers may be an issue at intersections.

\*\*\*NTSB Recommendation [H-06-12](#) recommended that States provide guidance on the use of median barriers on divided highways regardless of access type.

\*\*\*\* See NCHRP Report 790 "[Factors Contributing to Median Encroachments and Cross-Median Crashes](#)"

\*\*\*\*\*Cable median barriers can be placed on slopes as steep as 1H:6V. W-beam, Box-beam, and concrete barriers should be used on slopes no steeper than 1V:10H. NCHRP Project 22-22(02) "[Effectiveness of Traffic Barriers on Non-Level Terrain](#)" is researching the effect of terrain on barrier placement and will provide additional guidance for longitudinal barriers on slopes.