

In 2002 WSDOT engineers identified approximately 169 miles of divided highways with full access control and medians up to 50 feet in width as focus areas for median crossover protection. Since that time, approximately 136 miles of cable barrier has been installed in those areas. Another 14 miles has been treated with other barrier systems. There are approximately seven miles currently under contract for installation of cable barrier. The locations initially identified as potential sites for cable barrier installations on Washington highways are nearing completion. The performance of the cable barrier systems in those areas have led to questions about where we go from here.

Future planned installations

As noted above, there are approximately seven miles of cable barrier locations identified as part of 2003 and 2005 transportation revenue packages remaining to be installed. These miles cover portions of I-5, I-90, and SR 599 and are planned for completion between 2008 and 2011. In addition, we have identified another 21 miles for US 195, and US 395 that are appropriate for cable barrier installations. These projects are also planned for completion between 2008 and 2011.

New developments in cable barrier technology need to be considered in future designs and installations

As ongoing and future research efforts conclude, we anticipate there will be a need to expand existing policy and installation guidelines. Research into retrofitting existing low-tension barrier systems will necessitate decisions on investment priorities. With no change in revenue, WSDOT will need to determine whether it is more cost-effective to install median barrier in new locations or spend some of those funds to further the performance potential of existing installations. Design Manual guidance will convey the outcome of those decisions, and new Standard Plans will provide installation details of any new components.

We expect that new barrier systems currently under development will result in products that offer a broader range of possibilities for installation. Systems with high top cables and/or lower bottom cables will likely result in more flexibility for placement within the median. That flexibility will need to be clarified in WSDOT's Design Manual.

An ongoing research project is exploring how placement of cable barrier systems impacts performance of those systems. We expect the findings of that research will identify placement details that may require modification of current WSDOT Design Manual guidance. Future research into selection, use, and maintenance of cable barrier systems will likely result in better guidance on selection of which barrier system is most appropriate for differing site conditions. Those findings will be incorporated into WSDOT's Design Manual.

Should cable barrier be used on highways other than full access control?

As research and product modifications advance the practice of cable barrier installations, there are several challenges associated with implementation. For WSDOT, there are questions about whether cable barrier has a role on other facility types. WSDOT focused on cable median barrier on divided highway,

with full access control, where median width is 50 feet or less. Placement as a median barrier in other locations means having to consider routes with partial or modified access control and in wider medians. There are other challenges associated with placement of cable barrier on our roadsides. As current and future research projects conclude, they will no doubt present additional challenges as well as enhanced guidance for the use of cable barrier systems.

We looked at partial access routes

WSDOT's 2002 "Median Treatment Study of Washington State Highways" focused on full access controlled highways because of their higher traffic volumes and travel speeds. As cable barrier installations on those locations are nearing completion, there is interest in determining whether similar investment in divided highways without full access control is appropriate. Indeed, there are a few installations planned for these facilities. Early in 2008, WSDOT engineers evaluated these facilities in a similar fashion to the 2002 study of limited access facilities, focusing on median widths up to 50 feet. That evaluation indicated that a system-wide investment in these facilities was not cost-effective. However, there were 15 miles of highway that do appear to be a good investment. State Route 8 in Thurston and Grays Harbor counties accounts for most of these miles.

We also evaluated highways with medians wider than 50 feet

In WSDOT's 2002 "Median Treatment Study of Washington State Highways," we evaluated various ranges of median widths for placement of median barriers on divided highways with full access control. That study recommended median barriers for all medians up to 50 feet in width. That study also suggested that decisions should be made on a project-by-project basis regarding treatment of wider medians. The use of cable barrier systems in medians wider than 50 feet was re-evaluated in early 2008, and the resulting conclusion was similar to the 2002 study. Barrier installation as a standard practice for medians wider than 50 feet is not cost-effective for the entire highway system. The recent evaluation did identify a few locations where median barrier appears to be cost-effective in medians 50 to 70 feet wide. The most recent evaluation reveals that approximately 10 miles of full access controlled facilities and approximately seven miles of partial or modified access controlled facilities would provide a cost-effective investment in cable median barrier.

New research may find a role for cable barrier along the outside edge of highways

Although cable barrier was first used as a roadside barrier, rather than a median barrier, WSDOT has predominately used these barriers in the median. Because cable barriers deflect several feet when struck, their use is limited to locations where there is sufficient distance for the barriers to deflect without reaching the object(s) it shields. More rigid barriers, such as guardrail or concrete barrier, with reduced deflection distances are frequently selected for roadside applications. This is because they offer a more cost-effective treatment than cable barrier systems, particularly if additional right of way or roadside treatment is necessary to account for cable barrier deflection. Evolving designs and current research into placement guidance may identify an expanded role for cable barrier along our roadsides.

Cable barrier is being tested in narrow medians and in other applications

Evolving designs and current research into placement guidance may also identify an expanded role for cable barrier placement in narrow medians. The Oregon Department of Transportation (ODOT) has recently installed cable barrier in a paved median that is only eight feet wide. This location had experienced several centerline crossover collisions and a trial section of cable barrier was installed here. Deflection distance was reduced for this installation by reducing the distance between posts. ODOT will be monitoring this installation to determine the effectiveness of the barrier. WSDOT and other states will be reviewing ODOT's findings.



US 26 in Oregon (Mt. Hood Highway)

In addition to use in medians less than 50 feet wide, WSDOT is monitoring the development of cable barrier systems and placement research to determine whether cable barrier may be used in a broader range of applications, including use on steeper slopes, or a greater range of placement options within the median cross section. Future research is expected to reveal site conditions where traffic flow patterns and volumes can be used to better identify the most appropriate barrier system. Other research may reveal methods and components to retrofit existing installations to enhance performance.