

Three-Cable Barrier Makes I-5 Safer

HISTORY

Oregon public interest peaked regarding crossover highway safety between Salem and Wilsonville on Interstate 5 (I-5), Oregon Highway Number 1, following three fatalities from a crossover accident in August of 1996. In December of 1996, the Oregon Department of Transportation (ODOT) installed 14.5 km (9 miles) of weak-post three-cable median barrier.

SELECTION CRITERIA

ODOT selected cable barrier over concrete barrier for the selected site. The concrete barrier base would have eliminated the glare-guard median roses, and the need was only to prevent infrequent potentially catastrophic cross-median accidents.

The cable barrier annual costs are less than the concrete barrier annual costs for the selected location, period of study, and 4% inflation rate. The annual maintenance and repair costs are estimated at \$2,014/km for the cable system and \$35/km for the concrete system.



Three-cable median barrier system with spring turnbuckle

PERFORMANCE

The cable median barrier system has been effective in preventing crossover accidents at the selected location, from December 1996 through March 1998. Of the 53 barrier impacts, 21 potential crossovers were restrained from entering the opposing traffic lanes. Only three vehicles went through the cable barrier system. The two that underrode the cables did not crossover into the opposing traffic lanes. The third vehicle, a semi-truck, went through the cable barrier, crossing over into the opposing traffic lanes. None of the median barriers used in Oregon are designed to stop these larger vehicles, as it is not cost effective.

The fatality rate dropped from 0.6 per year for 1987 through 1996, to zero per year for the study period. In contrast, the injury accident rate increased from 0.7 per year for 1987 through 1996, to 3.8 per year for the study period. The most likely explanation for the increase in accidents is vehicles that drove into the median prior to the barrier installation and reentered the roadway without incident, are now impacting the cable system.

CABLE BARRIER IN OTHER STATES

ODOT's experience with the cable barrier is consistent with the studies other states have done. The main difference is the repair costs are considerably higher in Oregon. Other states have experienced a discrepancy between the number of police-reported accidents and the number of repairs, most likely from vehicles leaving the scene after impacting the barrier. Similarly for this study, police-reported accidents are available for only 51% of barrier impacts.



Flipped van restrained by the cable system

ADDITIONAL BARRIER INSTALLED

Since the cable median barrier is effective to date, ODOT installed 20.2 km (12.5 miles) of cable barrier in the gaps between Salem and Wilsonville in the spring of 1998.

ADVANTAGES OF CABLE BARRIER

- Cost of installation is inexpensive compared with other barrier systems;
- Forces on the occupants of the vehicles during a crash are low compared with other types of barriers;
- Cable barriers have good crash test performance [up to a 2000 kg (4409 lb) pick-up];
- System is aesthetically appealing; and
- Sight distance problems are minimized.

DISADVANTAGES OF CABLE BARRIER

- Barrier damage is increased in a typical accident, when compared to other systems;
- Damaged installations need to be repaired or replaced quickly since the damaged run may be ineffective until repaired;
- A minimum clear space is required behind the barrier for cable deflection; and
- Periodic retensioning of the cables is required.

RECOMMENDATIONS

The cable median barrier system should be considered in all locations that meet or exceed the requirements for the system as it is cost effective and exhibits good performance. The cable system is intended for use in locations where there is enough room for lateral deflections of up to 3.5 m (11.5 ft). The width of the median needs to be at least 7 m (23 ft) for a cable system centered in the median. Cable systems should not be used on sharp curves or where curbs exist or in areas where it is likely to be hit frequently.

TO FIND OUT MORE.....

Request a copy of the research report from the Research Unit by phone, e-mail, or in person. If you have access to the ODOT Network, an electronic copy is available at “s6000e\TDB\6531shar\Three-Cable Median Barrier Final Report.doc”. A copy will soon be available via the Research Unit web page as well.

For additional information about this project, contact Brett Sposito, Research Unit, by phone at (503) 986-2847, or via e-mail at brett.l.sposito@odot.state.or.us.

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