RESEARCH
Oregon Department of Transportation

Research Notes

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Three-Cable Barrier Still a "Hit"

The three-cable barrier on I-5 between Salem and Wilsonville is still providing for safe travel by preventing median crossover crashes. A total of 35.2 km (21.9 miles) of three-cable barrier is in place. In December 1996, 14.5 km (9.0 miles) of the barrier was installed. Another 20.7 km (12.9 miles) was installed by April 1998.

FATALITIES AND INJURIES

Even though there has been an increase in the number of minor injuries and total crashes, deaths related to median crossovers have been eliminated so far, as seen in the table below. The increase in crashes is most likely due to the vehicles that drove into the median prior to barrier installation and reentered the roadway without incident, now impacting the cable system. Increasing traffic levels is also a factor in the increase in crashes.

Fatalities & Injuries per Year

Original 14.5 km	Pre-Barrier (1987-1996)	Post-Barrier (12/96-11/99)
Total Crashes	1.0	30.3
Minor Injury	0.2	3.0
Moderate Injury	0.7	0.0
Major Injury	0.5	0.3
Fatalities	0.6	0.0

SAVINGS TO SOCIETY

Crash-related costs have dropped from $600,000 per year to $200,000 per year on the initial 14.5 km section, when comparing crashes before and after installation of the cable median barrier. This $400,000 is not a cost savings realized by ODOT but is a savings to society. The crash-related costs are calculated based on "Estimating the Cost of Unintentional Injuries, 1998" published by the National Safety Council.

Vehicle prevented from crossing into oncoming traffic.

PERFORMANCE

The performance of the cable system is summarized in the table below.

Impact Frequency & Events

	Original 14.5 km	Additional 20.7 km
Years in place	3.0	1.7
Total Impacts	91	59
Impact Frequency	1 / 12 days	1 / 10 days
Annual Impacts	30/yr	35/yr
Crossover Events	0.3/yr	0.0/yr
Underride/Roll Events	2/yr	2/yr
Potential Crossovers	14/yr	18/yr

BARRIER DOWN DAYS

The number of days between a crash and subsequent repair of the cable system is growing shorter. One factor is a clause in the repair contract (4/98) that all repairs must be accomplished within two weeks of notification.

Barrier Down Days

Period	Average # of days down before repair
12/96-3/98	30
4/98-12/98	15
1/99-11/99	9

ANNUAL COST ANALYSIS

The three-cable barrier system is less costly than the alternative concrete barrier system, as shown below.

Installation Costs

Barrier Type	Cost per km
Three-Cable Barrier (actual)	$26,357
Concrete, with Base (estimate)	$93,504

Annual maintenance and repair costs for the three-cable barrier system are much higher than for the concrete barrier system, as shown below. The cable barrier is a flexible system requiring repair each time it is impacted, whereas the concrete barrier is a more rigid and stable system, not receiving substantial damage from impacts.

Maintenance & Repair Costs

Barrier Section	Cost/km/yr
Original 14.5 km (12/96-11/99)	$2,366
Additional 20.7 km (4/98-11/99)	$2,664
Total 35.2 km (4/98-11/99)	$2,657
Concrete (estimate, 12/96-11/99)	$35

On the basis of a 30 year annual cost analysis, the cable barrier saves about $1,260 per km per year over the concrete barrier. Installation, maintenance and repair costs are considered in the analysis. Calculated for the entire 35 km currently in service, that represents a savings of $44,100 per year.

RECOMMENDATIONS

The cable system is recommended 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.

Although cable barrier installation costs are less than concrete, maintenance and repair costs for cable barrier are higher. Appropriate budget increases should take place for the agency charged with system maintenance.

TO FIND OUT MORE…..

Request a copy of the research report from the Research Group by phone, e-mail, or in person. A copy is also available on the Research Group web page listed below.

Three-cable median barrier system on I-5.

For more information about this project, contact the Research staff:
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