

SUMMARY REPORT 223-2F(S)

Walker
**SUMMARY OF CRASH CUSHION EXPERIENCE IN
TEXAS—FOUR HUNDRED COLLISIONS IN SEVEN
YEARS ON ONE HUNDRED THIRTY-FIVE
INSTALLATIONS**

**SUMMARY REPORT
of
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**Cooperative Research Program of the
Texas Transportation Institute
and the
State Department of Highways and Public Transportation
In Cooperation with the
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**TEXAS TRANSPORTATION INSTITUTE
Texas A&M University
College Station, Texas**

Summary of Crash Cushion Experience in Texas—Four Hundred Collisions in Seven Years on One Hundred Thirty-Five Installations

by

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Steel drum crash cushions (both fixed and portable) and the sand inertia barrier have made and will continue to make important contributions to the safety of our state's and nation's highways. These safety devices sometimes called vehicle impact attenuators (VIA's), were developed and implemented through close cooperation between TTI researchers and SDHPT highway engineers.

Texas first installed the steel drum crash cushion in October 1968. As of July 1, 1975, 147 crash cushions of all types were in use on Texas highways. These crash cushions have sustained over 400 vehicle impacts since the first installation more than seven years ago.

Both SDHPT engineers and TTI researchers felt that it was time to take a close look at the VIA's in Texas to see if changes or improvements were needed. Various aspects of the crash cushions were considered, such as:

1. Safety of the Motoring Public,
2. Safety to Highway Maintenance Personnel,
3. Initial Costs,
4. Maintenance and Repair Costs,
5. Durability, Reliability, etc.; and
6. Overall Cost Effectiveness.

Researchers from TTI and State Department of Highways and Public Transportation visited seven districts that had widely used the crash cushions to see if changes or improvements were needed. Discussions were held with traffic engineers, maintenance engineers, foremen and shop supervisors. As a result of these discussions and accident data gathered several changes or improvements were developed which should increase the safety and economy of the devices.

1. Redirection panels should be used only at locations where a high frequency of angular impacts with the back-up system is likely to occur. A greater number of sites can be protected with attenuation with funds available if use of redirection panels is kept to a minimum. Elimination of the redirection panels or fishscales will reduce the construction and maintenance cost of these crash cushions by one half or more.

2. Elimination of the requirement for using new steel drums would reduce costs further. Salvage and reconditioned drums that do not meet DOT specifications for packaging hazardous materials are satisfactory for crash cushions and cost less than one half as much.

3. The Portable Crash Cushion made of 55-gallon steel drums needs to be redesigned to eliminate fatigue failures and to improve the maneuverability of the system. A modified design is included in the Appendix.

4. Inertia barriers need regular routine inspections to determine if vandalism or deterioration by other forces has adversely affected the modules.

5. Other more detailed recommendations for fabrication, installation, and maintenance of crash cushions were developed which could further reduce the cost of these crash cushions.

As a result of this study the Federal Highway Administration has approved an SDHPT request to eliminate redirection panels on most of the steel drum crash cushions. In addition, the requirement for using new steel drums has been relaxed permitting the use of salvage and reconditioned drums. These and other changes are now being incorporated into new state design standards.

A copy of the full report of findings may be obtained by addressing your requests as follows:

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