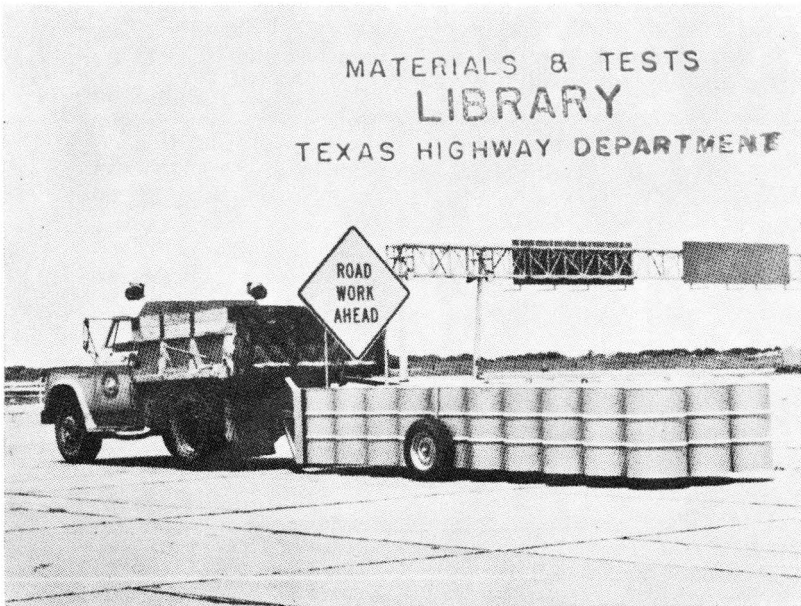


SUMMARY REPORT 146-6(S)

TEXAS CRASH CUSHION TRAILER TO PROTECT HIGHWAY MAINTENANCE VEHICLES

SUMMARY REPORT
of
Research Report Number 146-6
Study 2-8-68-146



Cooperative Research Program of the
Texas Transportation Institute and the Texas Highway Department
In Cooperation with the
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TEXAS TRANSPORTATION INSTITUTE
Texas A&M University
College Station, Texas

Texas Crash Cushion Trailer to Protect Highway Maintenance Vehicles

by

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This summary report describes one phase of Research Study 2-8-68-146 entitled "Adoption of Attenuation Systems."

Wheels have been added to the Texas Crash Cushion. The resulting trailer is a workable and easily used implement for the protection of personnel and equipment, especially when performing maintenance on our nation's highways and streets. The Texas Crash Cushion Trailer (TCCT) is constructed of 20 gage 55-gallon steel drums with 8 in. holes in the top and bottom, a set of wheels, and a truck trailer hitch. One crash test has been performed to verify the design theory. This test showed that the equations of mechanics predicted results which were very close to the test results.

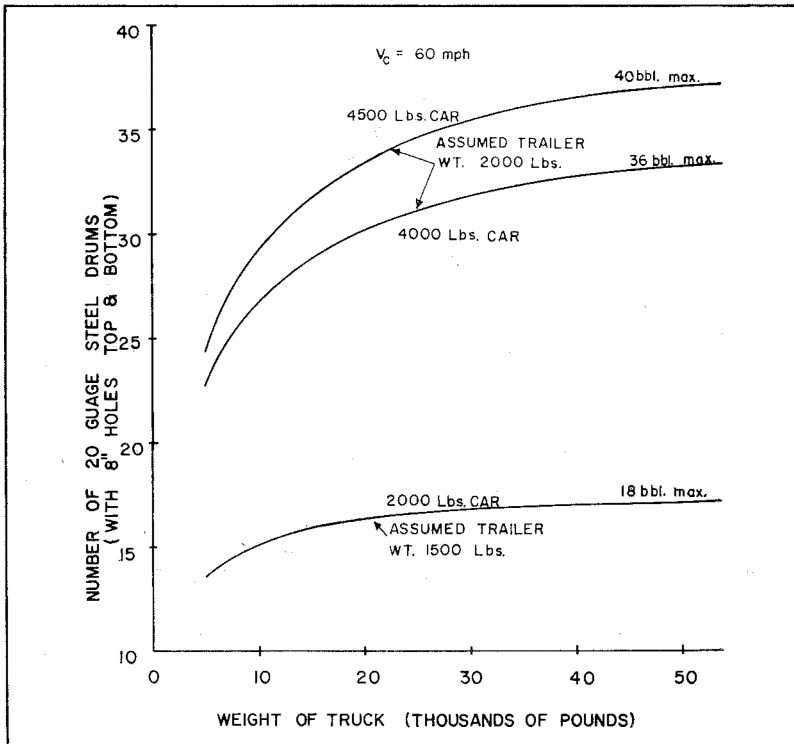


Figure 1. Number of barrels in crash cushion trailer vs. truck weight for several auto weights.

The Texas Crash Cushion Trailer varies from the usual crash cushion in that the object supporting the crash cushion is itself movable rather than firmly fixed in space. This fact reduces the number of steel drums required, but introduces a new variable in the form of the distance that the trailer and back up maintenance truck will travel if impacted by an errant vehicle. This variable of distance traveled after impact and the number of steel drums required are determined by introducing the equations of momentum and friction into the solution. When adequately attached to a maintenance vehicle such as a dump truck it will provide protection to the maintenance vehicle, maintenance or construction personnel, and the driver and passengers of an errant vehicle during a head-on impact. Figure 1 provides a ready reference for the selection of the number of drums required for usual highway use. Figure 2 can be used to determine the minimum distance a maintenance truck-crash cushion trailer combination should trail or be parked behind personnel and equipment to afford adequate protection from an impacting vehicle.

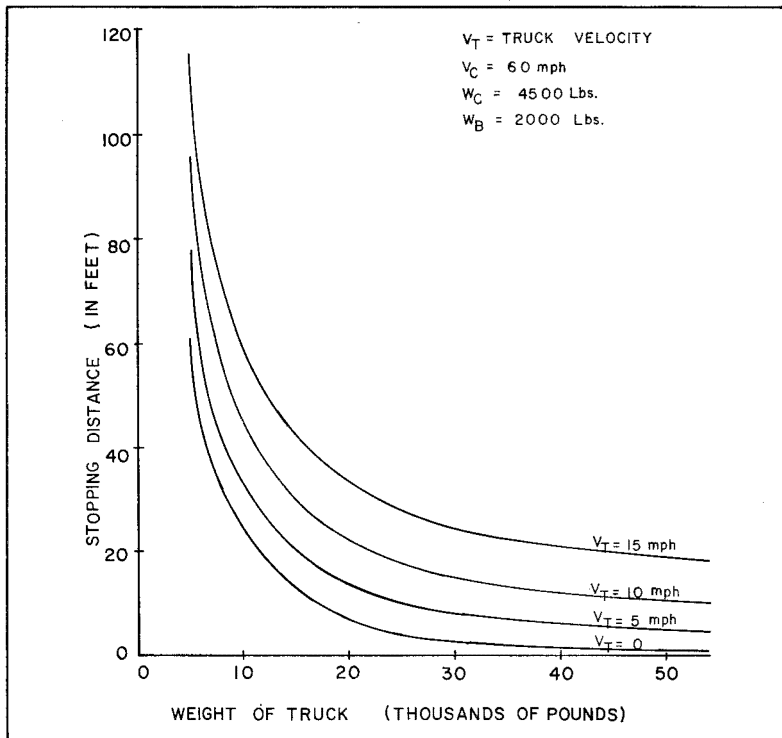


Figure 2. Stopping distance vs. truck weight for various initial truck speeds.

The report provides details for the assembly and construction for a TCCT and for modifications which would be necessary for the back up truck.

An allowance should be made for possible angular movement of the TCCT and the maintenance truck during an angular impact. Areas where TCCT's are being used include District 17 (Huntsville residency), District 12 (Houston) of the Texas Highway Department, and the City of Seattle, Washington.

There is a need for additional testing and evaluation especially for angle impacts for angles of 10 degrees and less.

The published version of this report may be obtained by addressing your request as follows:

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