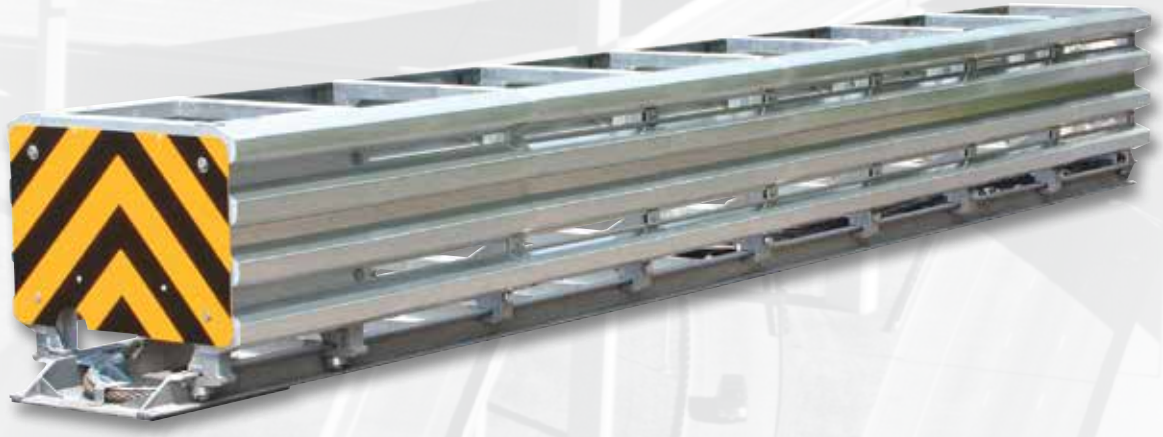
HILL & SMITH

SMART CUSHION®

The World's Only
Speed-Dependent
Crash Attenuators



SMART CUSHION INNOVATIONS®

MASH *AND* NCHRP 350 APPROVED

SMART CUSHION INNOVATIONS®

The World's Only Speed-Dependent Crash Attenuators

The Smart Cushion® crash attenuator is a revolutionary, speed-dependent product that varies stopping resistance during an impact. The Smart Cushion® crash attenuator allows lighter and slower-moving vehicles to have longer ridedown distances and lower ridedown g-forces.

Unlike fixed-resistance attenuators, the Smart Cushion® attenuator does not reach maximum stopping resistance unless a vehicle is traveling at the maximum design speed. This fully re-directive, non-gating, bidirectional, impact attenuator was designed for maximum safety and reusability, as well as outstanding durability before, during and after an impact.

The Smart Cushion® is the only attenuator with a reverse-tapered design to eliminate side panel stress during a collapse. It also has an extremely low angle of exit on side impacts (<1°) to keep vehicles from rebounding back into traffic and causing secondary accidents. This is the lowest angle of exit for any re-directive attenuator on the market.

How It Works

The hydraulic porting of the attenuator ensures that the proper resistance is used to stop the vehicle before it reaches the end of the cushion's usable length. The Smart Cushion® was specifically designed for durability and resetability to enable resets to be performed in less than 30 minutes. Side impacts within NCHRP 350 specifications do not damage the attenuator.

After an impact, the cushion requires a dual-stage pull-out with the replacement of two 1/4" shear bolts. The crash attenuator requires a minimal inventory of spare parts because of the new side panels' durability and the normal requirement of only two shear bolts on the frontal impact reset. Minimal damage means quick resetting and reduced worker exposure to traffic, as well as lower costs for traffic control, replacement parts and labor.

Ready To Install

Smart Cushion® attenuators come fully assembled for a pick-and-set install. A typical installation can be performed in less than 90 minutes. The Smart Cushion® is self-supporting and requires no additional support for permanent or temporary construction applications.

NCHRP 350 Test Results

All NCHRP 350 tests were performed on the same unit over four consecutive days. All tests showed outstanding results for ridedown g-forces and low angle of exit. There were no replacement parts required prior to the next test except for shear bolts.

MASH Test Results All Test Level 3 MASH tests were performed including the optional midsize car test using an independent accredited testing facility. Once again, the Smart Cushion® established records for ridedown G forces for small vehicles just like it did with NCHRP 350. The Test Level 2 system successfully performed the pickup capacity test #2-31.

Repair Costs

Based on MASH test results, the SCI100GM required the following parts and labor:

MASH TEST LEVEL 3 REPAIR RESULTS	Part Names	Cost	Repair Hrs.	Cost	Total Cost
#3-31 2270 kg vehicle 0 degree frontal impact	2 - Shear Bolts	$1	2 man hours	$80	$81
#3-35 2270 kg vehicle 25 degree side impact	3 - Side Panels	$480	2 man hours	$80	$560
#3-37 2270 kg vehicle 25 degree reverse side impact	None	$0	0	$0	$0

Test Levels Available

The SCI100GM is a MASH and NCHRP 350 Test Level 3 attenuator and the SCI70GM is a MASH and NCHRP 350 Test Level 2 attenuator based on the pickup capacity test. The Smart Cushion® attenuators can protect a wide range of hazards including but not limited to bridges, median barriers and highway signs.

reusability.

The first speed-dependent, variable-resistance attenuator that can ramp resistance up or down to provide the smoothest ridedown of any system on the market.

SMART CUSHION INNOVATIONS®

Highlights

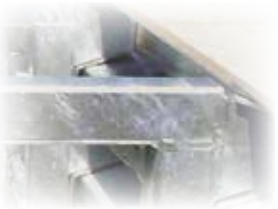
Safety Benefits

- Variable resistance (speed-dependent), not fixed resistance, provides consistent deceleration during ridedown.
- Longer ridedown distances and lower sustained g-forces for lighter or slower-moving vehicles.
- Quick and easy resets for reduced worker exposure to traffic.
- Low angle of exit on side impacts (<1°) to keep vehicle from rebounding back into traffic.
- No mobilization required after side impacts reduces public and worker exposure.

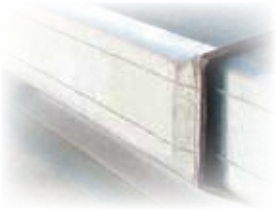
Cost Benefits

- Few replacement parts requirement virtually eliminates spare parts inventory and parts costs.
- Thirty minute resets reduces labor and traffic control costs.
- The reverse-tapered design eliminates side panel stress on frontal impacts to reduce damage and system fatigue from multiple impacts.
- Life cycle cost savings increase dramatically as additional impacts occur.
- No damage on side impacts can save up to 75% on repair costs.
- Systems shipped from factory fully assembled reduce on-site labor.

Features



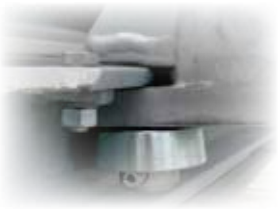
Support Gussets
Gussets located behind the panels reduce gap formation and deformation to prevent snagging on reverse side impacts.



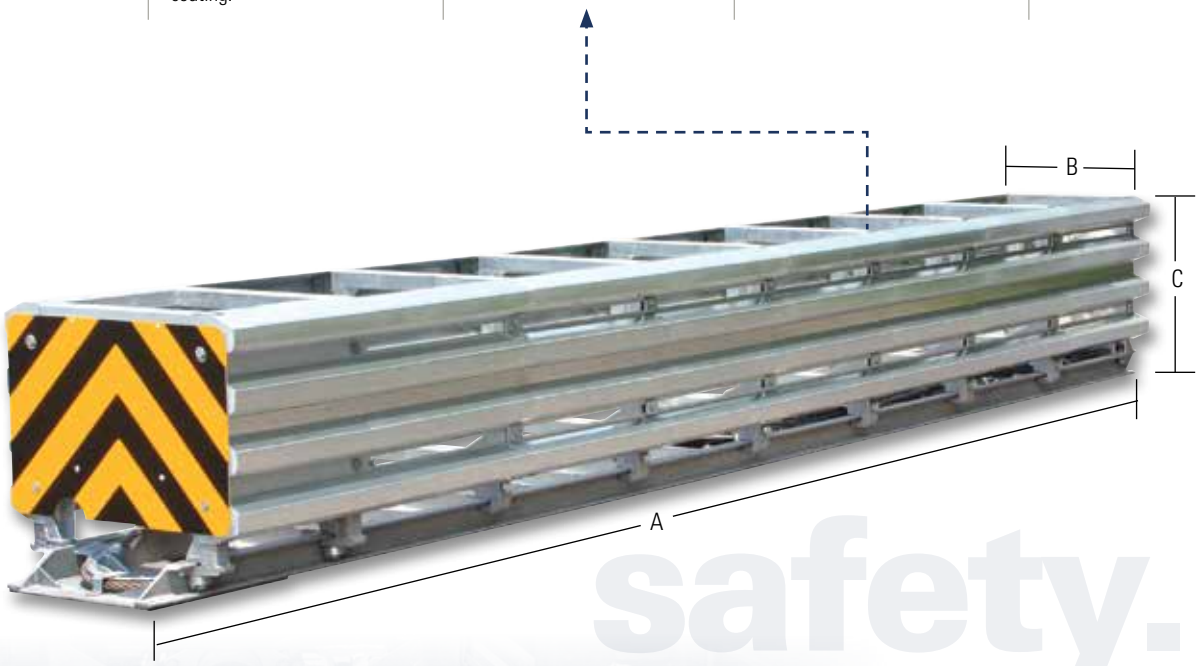
Stronger Side Panel
The panel is over 90% stronger than curved profiles. The profile allows the edges to be beveled, reducing the potential for snagging and damage on reverse-direction impacts. The panel also smoothly redirects vehicles on side impacts. The side panel is fabricated from 10-gauge, 60-ksi, minimum-yield steel with an ASTM A123 galvanized coating.

Cable & Cylinder System
This system allows longer ridedown distances for smaller vehicles, as well as smoother ridedown with lower g-forces for all vehicles. The cylinder's hydraulic porting assures a controlled ridedown by applying the necessary resistance required based on the speed and mass of the vehicle.

Side Guide Design
This revolutionary design withstands side impacts with no damage.



Front Rollers
The roller guide design on the front sled produces a smooth, aligned collapse by reducing friction and binding.



safety.

Smart Cushion® Dimensions	Test Level 2 MASH-NCHRP 350	Test Level 3 MASH-NCHRP 350
A	13' 6"	21' 6"
B	24"	24"
C	34"	34"
Weight	2470 lbs.	3450 lbs.

Weights are for attenuators only

About Hill & Smith

Hill & Smith is the international leader in traffic control devices and work zone safety products. For decades, we have been meeting customer needs and exceeding quality standards with a wide range of highway and construction safety products. We back these products with knowledgeable, personalized customer service and strong distributor support.

Part No.	Description	Weight
Attenuators		
270128	SCI100GM Attenuator 24" wide w/Concrete Anchors Test Level 3 MASH/NCHRP 350	3500 lbs.
270127	SCI100GM Attenuator 24" wide w/Asphalt Anchors Test Level 3 MASH/NCHRP 350	3575 lbs.
270126	SCI70GM Attenuator 24" wide w/Concrete Anchors Test Level 2 NCHRP 350	2500 lbs.
270125	SCI70GM Attenuator 24" wide w/Asphalt Anchors Test Level 2 NCHRP 350	2550 lbs.
Anchor Kits		
270667	Concrete Anchor Kit for SCI100GM - requires #272612 Epoxy Kit	
270663	Asphalt Anchor Kit for SCI100GM - requires #272610 Epoxy Kit	
270666	Concrete Anchor Kit for SCI70GM - requires #272611 Epoxy Kit	
270664	Asphalt Anchor Kit for SCI70GM - requires #272609 Epoxy Kit	
Accessories		
270683	Shear Bolt	
273378	Delineator Panel Yellow Test Level 3	
273380	Delineator Panel Yellow Test Level 2	
272621	Reset Parts Kit Test Level 3	
272620	Reset Parts Kit Test Level 2	
Transitions		
275297	Transition 24" Jersey Barrier - Right (viewed from front)	
275294	Transition 24" Jersey Barrier - Left (viewed from front)	
275263	Transition 24" Concrete - Left & Right	
Transitions available for 30", 36", wide gores, various shaped barriers and guardrails		

Transition 24" Jersey Barrier

Transition 24" Concrete

Disclaimer

This product is only intended for use as a re-directive impact attenuator. Installations must be performed strictly according to manufacturer's specifications. Improper installation, modification, or unintended use may create a hazardous condition that can cause personal injury, property damage or death. Any modification or unintended use of this product shall immediately void all manufacturer's warranties. Hill & Smith disclaims all liability for injuries to persons or property resulting from any modifications to, unintended use of, or installation of, this product other than in strict accordance with the manufacturer's specifications.

Designs are subject to change without notice.

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US Patent No. 6,962,459
US Patent No. 7,018,130
US Patent No. 7,070,031
US Patent No. 7,086,805

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