

# Crash Cushions

NAME	MANUFACTURER	PERFORMANCE CHARACTERISTICS			TEST LEVEL		DIMENSIONS			LOCATIONS		HOW IT WORKS	LOCATIONS CAN BE USED	MAINTENANCE CHARACTERISTICS (per AASHTO RDG)	
		Non-Redirective, Gating	Redirective, Gating	Redirective, Non-gating	NCHRP 350	MASH	WIDTH (without transitions)	LENGTH	HEIGHT	PERMENANT	TEMPORARY				
Energite <a href="http://www.energyabsorption.com/products/products_energite_iii.asp">http://www.energyabsorption.com/products/products_energite_iii.asp</a>		Energy Absorption Systems	X			TL-2, TL-3		Varies to fit site	VARIABLE (30 to 65 mph)	32" to 36"	X	X	Sand-filled plastic barrels dissipate the kinetic energy of an impacting vehicle by transferring the vehicle's momentum to the variable masses of sand in the barrels that are hit.	Temporary Construction Worksites i.e. Ends of Concrete Barriers; Gore Two sided Protection; Wide Medians; Bridge Piers	Sacrificial
Fitch <a href="http://www.energyabsorption.com/products/products_universal_barrels.asp">http://www.energyabsorption.com/products/products_universal_barrels.asp</a>		Energy Absorption Systems	X			TL-2, TL-3		Varies to fit site	VARIABLE (30 to 65 mph)	33"	X	X	Sand-filled plastic barrels dissipate the kinetic energy of an impacting vehicle by transferring the vehicle's momentum to the variable masses of sand in the barrels that are hit.	Temporary Construction Worksites i.e. Ends of Concrete Barriers; Gore Two sided Protection; Wide Medians; Bridge Piers	Sacrificial
Big Sandy <a href="http://www.traffixdevices.com/cgi-local/SoftCart.exe/big sandy.htm?E+scstore">http://www.traffixdevices.com/cgi-local/SoftCart.exe/big sandy.htm?E+scstore</a>		Traffix Devices	X			TL-2, TL-3		Varies to fit site	VARIABLE (30 to 65 mph)	35" to 47"	X	X	Sand-filled plastic barrels dissipate the kinetic energy of an impacting vehicle by transferring the vehicle's momentum to the variable masses of sand in the barrels that are hit.	Temporary Construction Worksites i.e. Ends of Concrete Barriers; Gore Two sided Protection; Wide Medians; Bridge Piers	Sacrificial
CrashGard <a href="http://www.plasticsafety.com/crash-cushions-sand-barrels">http://www.plasticsafety.com/crash-cushions-sand-barrels</a>		Plastic Safety Systems	X			TL-2, TL-3		Varies to fit site	VARIABLE (25 to 70 mph)	53"	X	X	Sand-filled plastic barrels dissipate the kinetic energy of an impacting vehicle by transferring the vehicle's momentum to the variable masses of sand in the barrels that are hit.	Temporary Construction Worksites i.e. Ends of Concrete Barriers; Gore Two sided Protection; Wide Medians; Bridge Piers	Sacrificial
RAPTOR <a href="http://www.barriersales.com/products/raptor/">http://www.barriersales.com/products/raptor/</a>		Barrier Systems, Inc.	X			TL-1		45"	8'-0" and 9'-0"	41"	X		Enclosed energy absorbing material crushes on impact.	Poles/trees located close to the road.	Sacrificial



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Absorb 350 <a href="http://www.barriersystemsinc.com/#/absorb-350">http://www.barriersystemsinc.com/#/absorb-350</a>	 Barrier Systems, Inc.	X			TL-2, TL-3		24"	VARIABLE 19'-4" (45 mph) to 32'-0" (60 mph)	32"	X	X	Plastic waterfilled elements allow vehicles to be decelerated.	Temporary Construction worksite. Narrow spaces Roadsides, exits and wide medians. Any locations where it is safe for the post impact trajectories to be on the back side of the system.	Sacrificial
ACZ350 <a href="http://www.energyabsorption.com/products/products_acz.asp">http://www.energyabsorption.com/products/products_acz.asp</a>	 Energy Absorption Systems	X			TL-2, TL-3		20"	31'-7"	33"		X	Plastic waterfilled elements allow vehicles to be decelerated.	Temporary Construction worksite. Narrow spaces Roadsides, exits and wide medians. Any locations where it is safe for the post impact trajectories to be on the back side of the system.	Sacrificial
SLED <a href="http://traffixdevices.com/cgi-local/SoftCart.exe/newproducts.htm?L+scstore+tsjv8007ff838f8+1364541558">http://traffixdevices.com/cgi-local/SoftCart.exe/newproducts.htm?L+scstore+tsjv8007ff838f8+1364541558</a>	 Traffix Devices	X			TL-2, TL-3		24"	18'-11" (45 mph) and 26'-0" (60 mph)	46"		X	Plastic waterfilled elements allow vehicles to be decelerated.	Temporary Construction worksite. Narrow spaces Roadsides, exits and wide medians. Any locations where it is safe for the post impact trajectories to be on the back side of the system.	Sacrificial

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NEAT <a href="http://www.energyabsorption.com/products/products_neat_crash.asp">http://www.energyabsorption.com/products/products_neat_crash.asp</a>		Energy Absorption Systems	X			TL-2		22.5"	10'-0"	32"		X	Energy absorbing hex foam surrounded by aluminum sheeting is crushed upon impact.	Temporary Construction Worksite.  Any locations where it is safe for the post impact trajectories to be on the back side of the system.	Sacrificial
Thrie-Beam Bullnose Guardrail System <a href="http://www.fhwa.dot.gov/publications/publicroads/99janfeb/jungle.cfm">http://www.fhwa.dot.gov/publications/publicroads/99janfeb/jungle.cfm</a>		Generic		X		TL-3		14'-9" but can vary	Varies 50' minimum	31.6"		X	Breakaway posts and slots in thrie-beam rail weaken the system allowing rail to collapse. Cables inside rail help to capture vehicle.	Wide medians, connections at bridge openings, bridge piers.	Sacrificial
CIAS Connecticut Impact Attenuating System <a href="http://www.ct.gov/dot/cwp/view.asp?a=1387&amp;q=259608">http://www.ct.gov/dot/cwp/view.asp?a=1387&amp;q=259608</a>		Generic		X		TL-3		144"	25'-6"	48"		X	Hollow steel cylinders, some reinforced, crush upon impact. Total 14 cylinders.  Requires Paved Pad.	Shield ends of wide hazards.	Sacrificial
NCIAS Narrow Connecticut Impact Attenuating System <a href="http://www.ct.gov/dot/cwp/view.asp?a=1387&amp;q=259626">http://www.ct.gov/dot/cwp/view.asp?a=1387&amp;q=259626</a>		Generic		X		TL-3		36"	24'-0"	48"		X	Hollow steel cylinders, some reinforced, crush upon impact. Cables on the side are for traffic face impacts. Total 8 cylinders.  Requires Paved Pad.	Shield ends of narrow hazards.	Sacrificial
Advanced Dynamic Impact Extension Module (ADIEM) <a href="http://www.highwayguardrail.com/products/adiem.html">http://www.highwayguardrail.com/products/adiem.html</a>		Trinity Highway Products		X		TL-3		20"	30'-0"	Varies		X	Lightweight crushable concrete allows vehicles to be decelerated. The modules are placed on a high-strength tapered concrete base.	Wide median protection. Because of durability of concrete modules, system is more suited for temporary applications.	Sacrificial

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		Non-Redirective, Gating	Redirective, Gating	Redirective, Non-gating	NCHRP 350	MASH	WIDTH (without transitions)	LENGTH	HEIGHT	PERMENANT	TEMPORARY			
BEAT-SSCC Single Sided Crash Cushion <a href="http://www.roadsystems.com/beat-sscc.html">http://www.roadsystems.com/beat-sscc.html</a>	 Road Systems, Inc.		X		TL-3		24"	28'-0" standard but available in lengths of 32', 36', 40', 44'	28"	X		Mandrel section of the impact head bursts the tubing to absorb the impact energy.  Attaches directly to rigid barriers, bridge rails and abutments.	Shoulder Protection  Ground mounted or surface mounted post on a concrete pad.	Sacrificial
BEAT-BP Bridge Pier System <a href="http://www.roadsystems.com/beat-bp.html">http://www.roadsystems.com/beat-bp.html</a>	 Road Systems, Inc.		X		TL-3		Variable to adjust to pier widths	Variable to adjust to number of piers and pier spacing. i.e. 1 pier = 79', 2 pier = 103', 3 pier = 115', 4 pier = 151'	28"	X		Mandrel section of the impact head bursts the tubing to absorb the impact energy.  System completely surrounds piers and has attenuator at both approach ends.	Median protection at bridge piers.	Sacrificial
Quadtrend <a href="http://www.energyabsorption.com/products/products_quadtrend350_end.asp">http://www.energyabsorption.com/products/products_quadtrend350_end.asp</a>	 Energy Absorption Systems		X		TL-3		15"	20'-0"	32"	X		Quadbeam rail sections translate downstream while sand filled containers are crushed.  Attaches directly to rigid barriers, bridge rails and abutments.  Requires redirecting cable on backside of system to direct the rail sections away from traffic.  Requires Paved Pad.	Shoulder protection at the end of rigid barriers	Sacrificial
X-TENUator <a href="http://www.barriersystemsinc.com/#/x-tenuator">http://www.barriersystemsinc.com/#/x-tenuator</a>	 Barrier Systems, Inc.			X	TL-3		21"	24'-9"	27.75"	X	X	Impact head has locking bar to lock cables into place. The friction between the cables and the impact head dissipates crash energy.	Median or shoulder Protection  Gore Two-side Protection	Sacrificial



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QUEST  <a href="http://www.energyabsorption.com/products/products_questimpact.asp">http://www.energyabsorption.com/products/products_questimpact.asp</a>		Energy Absorption Systems			X	TL-2, TL-3		24"  30"  36"	22'-0" (45 mph or less)  28'-0" (50 mph or greater)  34'-0" (70 mph)	31"	X		Consists of a series of W-Beam fender panels supported by diaphragms with a trigger mechanism at the nose that releases the front assembly.  Requires Paved Pad.	Median or shoulder Protection  Gore Two-side Protection	Refer to Manufacturer
Trinity Attenuating Crash Cushion (TRACC) Family  <a href="http://www.highwayguardrail.com/products/tracc.html">http://www.highwayguardrail.com/products/tracc.html</a>		Trinity Highway Products			X	TL-2, TL-3		FASTRACC: 24"  TRACC: 24"  SHORTRACC: 24"  WIDEFAST TRACC: 71"-139"  WIDETRACC: 58"-127"  WIDESHORT: 39"-108"	25'-9" (70 mph)  21'-3" (50 mph or greater)  14'-3" (45 mph or less)  25'-8" to 48'-10" (70 mph)  21'-0" to 44'-2" (50 mph or greater)  14'-1" to 37'-3" (45 mph or less)	32"	X	X	Metal is sheared at the base and double sets of W-Beam rails translate.  Requires Paved Pad.	Median or shoulder Protection  Gore Two-side Protection	Refer to Manufacturer
QuadGuard Family QuadGuard, QuadGuard-II, QuadGuard M-10 (MASH)  <a href="http://www.energyabsorption.com/products/products_quadguard2_crash.asp">http://www.energyabsorption.com/products/products_quadguard2_crash.asp</a>		Energy Absorption Systems			X	TL-2, TL-3	TL-2, TL-3	NARROW: 24", 30" and 36"  WIDE: 69" or 90"	VARIABLE 9'-0" (45 mph) to 27'-0" (70 mph)  VARIABLE 12'-0" (50 mph) to 27'-0" (70 mph)	32"	X	X	Hex-foam cartridges crush upon impact. Specially fabricated side panels having four corrugations slide back on a single track when struck head-on.  Energy absorbing cartridges in each bay need to be replaced after a crash.  Requires Paved Pad.  Using a transition can be directly attached to a W-beam or thrie beam median barrier or concrete safety shape.	Median or shoulder Protection  Gore Two-side Protection	Reusable



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Universal TAU II Family  <a href="http://www.barriersystemsinc.com/#/tau-ii">http://www.barriersystemsinc.com/#/tau-ii</a>	 Barrier Systems, Inc.			X		TL-2, TL-3	NARROW: Up to 36"  WIDE: 42" up to 102" in 6" increments	VARIABLE 8'-6" (30 mph) to 37'-0" (75 mph)  VARIABLE 8'-8" (30 mph) to 31'-6" (70 mph)	32"	X	X	Energy absorbing cartridges crush upon impact. Thrie beam panels slide back when struck head-on. Anchored at the front and rear of system.  Width and lengths are variable depending on hazards, site conditions and design speed.  Energy absorbing cartridges in each bay need to be replaced after a crash.  Requires Paved Pad.	Median or shoulder Protection  Gore Two-side Protection	Reusable
EASI-CELL  <a href="http://www.energyabsorption.com/products/products_easi-cell_cluster.asp">http://www.energyabsorption.com/products/products_easi-cell_cluster.asp</a>	 Energy Absorption Systems	X				TL-1	51" but can vary	8'-6" but can vary	39"	X		Clusters of high molecular weight, high density polyethylene collapse to absorb energy of impacting vehicle.	Low Speed, High frequency impact sites.	Low-Maintenance
TAU II R  <a href="http://www.barriersystemsinc.com/#/restorable-crash-cushion-tau-ii-r-barrier-systems-inc">http://www.barriersystemsinc.com/#/restorable-crash-cushion-tau-ii-r-barrier-systems-inc</a>	 Barrier Systems, Inc.			X		TL-2, TL-3	NARROW: Up to 36"  WIDE: 42" up to 102" in 6" increments	VARIABLE 8'-6" (30 mph) to 37'-0" (75 mph)  VARIABLE 8'-8" (30 mph) to 31'-6" (70 mph)	32"	X	X	Hyperelastic modules crush upon impact. Thrie beam panels slide back when struck head-on. Anchored at the front and rear of system.  Width and lengths are variable depends on hazards, site conditions and design speed.  Requires Paved Pad.	Median or shoulder Protection  Gore Two-Side Protection	Low-Maintenance
Compressor  <a href="http://traffixdevices.com/cgi-local/SoftCart.exe/compressor.htm?L+scstore+tsjv8007ff838f8+1360807249">http://traffixdevices.com/cgi-local/SoftCart.exe/compressor.htm?L+scstore+tsjv8007ff838f8+1360807249</a>	 Traffix Devices			X		TL-3	48.7"	21'-3"	53.5"	X		Modules molded from High Density Polyethylene absorb the impact energy. Steel side panel translate during end-on impacts. The assembly is combined with Uni-Base.  Requires Paved Pad.	Median or shoulder Protection  Gore Two-Side Protection	Low-Maintenance



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Hybrid Energy Absorption Reusable Terminal (HEART)  <a href="http://www.highwayguardrail.com/products/heart.html">http://www.highwayguardrail.com/products/heart.html</a>	 Trinity Highway Products			X			28"	15'-9 1/2" (45 mph or less)  28'-3" (50 mph or greater)  30'-9" (70 mph)	32.2"	X	X	High Molecular Weight / High Density Polyethylene side panels connected to steel diaphragms mounted on tubular steel tracks and compress upon impact.  Requires Paved Pad.	Median or shoulder Protection  Gore Two-side Protection	Low-Maintenance
QuadGuard Elite and QuadGuard Elite M10 (MASH)  <a href="http://www.energyabsorption.com/products/products_quadguard_elite.asp">http://www.energyabsorption.com/products/products_quadguard_elite.asp</a>	 Energy Absorption Systems			X			NARROW: 24" to 36"           WIDE: 69" or 90"	5 Bay - 18'-0" (45 mph or less)  8 Bay - 27'-0" (50 mph or greater)  11 Bay - 36'-0" (70 mph)  7 Bay - 18'-0" (45 mph or less)  8 Bay - 27'-1" (50 mph or greater)  11 Bay - 36'-0" (70 mph)	32"	X	X	High Density Polyethylene cylinders and flex-belt nose collapse upon impact. Specially fabricated side panels having four corrugations slide back on a single track when struck head-on.  Requires Paved Pad.	Median or shoulder Protection  Gore Two-side Protection	Low-Maintenance
Reusable Energy Absorbing Crash Terminal REACT 350 & REACT 350 II  <a href="http://www.energyabsorption.com/products/products_react350_impact.asp">http://www.energyabsorption.com/products/products_react350_impact.asp</a>	 Energy Absorption Systems			X			NARROW: 30"-36"           WIDE 60" WIDE 96" WIDE 120"	13'-9" and 15'-3" (45 mph)  19'-5" and 21'-3" (62 mph) REACT II  26'-9" and 30'-7" (70mph)   30'-10" 34'-9" 33'-10"	51.5"           46"	X	X	Hollow high molecular weight, high density polyethylene cylinders crush upon impact.  Cables on the side are for side impacts.  Requires Paved Pad.	Median or shoulder Protection  Gore Two-side Protection	Low-Maintenance

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QuadGuard LMC  <a href="http://www.energyabsorption.com/products/products_quadguard_lmc.asp">http://www.energyabsorption.com/products/products_quadguard_lmc.asp</a>	 Energy Absorption Systems			X		TL-3		NARROW: 36"  WIDE: 69" or 90"	5 Bay - 18'-0" (45 mph or less) 8 Bay - 27'-0" (50 mph or greater) 11 Bay - 36'-0" (70 mph)  7 Bay - 18'-0" (45 mph or less) 8 Bay - 27'-1" (50 mph or greater) 11 Bay - 36'-0" (70 mph)	32"	X	X	Elastic cylinders collapse upon impact. Specially fabricated side panels having four corrugations slide back on a single track when struck head-on.  Requires Paved Pad.	Median or shoulder Protection  Gore Two-side Protection	Low-Maintenance
Smart Cushion Innovations (SCI)  <a href="http://www.workareaprotection.com/attenuator.htm">http://www.workareaprotection.com/attenuator.htm</a>	 SCI Products			X		TL-2, TL-3		24"	13'-8" (45 mph or less)  21'-8 1/4" (60 mph or greater)	33.4"	X	X	Hydraulic cylinders in the attenuator provides resistance used to stop the vehicle before it reaches the end of the cushion's usable length.  Requires Paved Pad.	Median or shoulder Protection  Gore Two-side Protection	Low-Maintenance