Beams, Drop-Arm Style (active)

Barrier Name	Barrier Rating (mph)	Designer	Description (Optional)
CRB-360	50	Atlantic Anti-Ram / ATR	
VPL-CB-24	50	AutoGate Inc. / AGI	Drop arm, 36” to center of bar, foundation depth 63”
DSC 7000	50	Delta Scientific / DEL	6x6” steel tube drop arm with 12 foot clear opening, 33.87” high, foundation depth 3’
NMSB XII	50	Nasatka / NAS	18’ hydraulic drop arm, 35” high, foundation depth at each end 36 3/8”
VPL-K8-Shield	40	AutoGate Inc. / AGI	K8-rated drop arm that can be used in conjunction with a gate
CRB-240	30	Atlantic Anti-Ram / ATR	Drop bar, 12’ opening, 30” to bottom of bar, 10.5” x 6.5” aluminum beam with two 8x1” 4-ply nylon straps, foundation depth 40”, P-110 hydraulic pumping unit
DS-70 manual drop arm	30	Department of State / DOS	Manual drop arm, 12’ opening, 56 ¼” deep RC bollards at ends, 1 ½” dia 6x19 steel cored cable in 6x6” hollow structural section, counterweights at operator end
RSS-3000	30	Robotic Security Systems Inc. / RSS	

Beams, Post and Beam Style (passive)

Barrier Name	Barrier Rating (mph)	Designer	Description (Optional)
DS-45	50	Department of State / DOS	Post-dual beam fence, no continuous foundation, 8’ 9” augered holes for posts 12” x 12” x ½” steel tube, holes back-filled with concrete (no rebar)

Beams, Rising Style (active)

Barrier Name	Barrier Rating (mph)	Designer	Description (Optional)
Patriot	50	ATG Access Inc / ATG	Hydraulic rising beam, 36” to top, 12’ opening, foundation 14” midspan, with 54” footers at ends
BLS (6m)	50	Gunnebo Wego GmbH / GUN	Hydraulic rising beam with 6m (20’) clear opening, foundation depth 44 / 63”
VSH 610 - 6m	50	Heintzmann Group GmbH / HZG	Hydraulic rising beam with 6m (20’) clear opening, 27’ total width, 8x8” beam 36” above grade, each foundation depth 55”
VSH 610 - 8.2m	50	Heintzmann Group GmbH / HZG	Hydraulic rising beam with 8.2m (27’) clear opening, 34.5’ total width, 8x8” beam 36” above grade, each foundation depth 55”
Permanent Arrestor	50	Pro Barrier Engineering LLC / PBE	Surface mounted hydraulic operated beam, hinged operation like a wedge when raising beam
BLS (9m)	30	Gunnebo Wego GmbH / GUN	Hydraulic rising beam with 9m (30’) clear opening, foundation depth 44 / 83"

Bollards, Fixed Style (passive)

Barrier Name	Barrier Rating (mph)	Designer	Description (Optional)
DS-203	50	Department of State / DOS	2-post shallow foundation (18") system which can be outfitted as a Streetscape Vehicular Anti-Ram (SVAR) bench
DS-204	50	Department of State / DOS	3-post shallow foundation (18") system which can be outfitted as a Streetscape Vehicular Anti-Ram (SVAR) bus shelter
DS-206	50	Department of State / DOS	5-post shallow foundation (18") system which can be outfitted as a Streetscape Vehicular Anti-Ram (SVAR) bus shelter
DS-207	50	Department of State / DOS	2-post shallow foundation (18") system which can be outfitted as a Streetscape Vehicular Anti-Ram (SVAR) sign
DS-208	50	Department of State / DOS	5-post shallow foundation (18") system which can be outfitted as a Streetscape Vehicular Anti-Ram (SVAR) bus shelter
DS-22	50	Department of State / DOS	Min. 3 bollard array, 48” clear opening, 39” high, depth 4’, 22R removable variant with embedded sleeve
DS-22R (removable bollard)	50	Department of State / DOS	Steel pipe bollards were fabricated from 10.75" OD schedule 140 steel pipe, positioned in steel sleeves fabricated from 12.75" OD schedule 100 steel pipe. Each bollard was 84" in length and projected 40" above the concrete footing.
DS-23	50	Department of State / DOS	Min. 3 bollard array, 48” clear opening, 39” high, tilted 10 deg. off vertical in attack direction, depth 18”
DS-24 (50 mph)	50	Department of State / DOS	Bollards in 12” x 4” steel tubing encased in concrete, connected by 4” square box tubing, adjustable for grade changes, 58” on center, depth 20.6” Individual bollard encased for 40 mph, full foundation encasement in concrete for 50 mph
DS-205	40	Department of State / DOS	2-post shallow foundation (11") system which can be outfitted as a Streetscape Vehicular Anti-Ram (SVAR) bench
DS-24 (40 mph)	40	Department of State / DOS	Bollards in 12” x 4” steel tubing encased in concrete, connected by 4” square box tubing, adjustable for grade changes, 58” on center, depth 20.6” Individual bollard encased for 40 mph, full foundation encasement in concrete for 50 mph
DS-201	30	Department of State / DOS	2-post shallow foundation (18") system which can be outfitted as a Streetscape Vehicular Anti-Ram (SVAR) bench
DS-25	30	Department of State / DOS	39” high, 8” diameter, 48” clear opening, RC foundation 30” x 30”; Options for 10” dia. to integrate w/ DS-22 perimeter

Bollards, Retractable Style (active)

Barrier Name	Barrier Rating (mph)	Designer	Description (Optional)
Titan	50	ATG Access Inc / ATG	Min. 3 bollard array at 32” on center, bollard 38” high, foundation depth 5.7’, hydraulic
PDT 1200	50	Calpipe Industries / CAL	Min. 3 bollard array at 39” on center, 36” high (structural), 36” with décor and cap, depth 5’, hydraulic
DSC-720-1M	50	Delta Scientific / DEL	This was tested in California, April, 2013. This 1M tall system was designed to counter taller trucks, especially those found in Europe and the Mideast (the old DSC-720 was only 35" tall). Tested as a set of three bollards and designed to control a 12-foot (3.7 M) lane, the new DSC720-1M bollards stopped a 15,000 lb. flatbed truck impacting at 50 mph with zero penetration of the vehicle. The new bollards feature a variety of power options including Delta’s hydraulic power unit (HPU), all-weather pneumatic, electro-mechanical, manual or fixed post (see DSC-720-1M-Fixed-Post).
Model 400	50	National Intelligent Traffic Systems / NIT	Set of 3 hydraulic bollards at 36” on center, 36” high, 5.8’ deep
Hard Post EP-354A	50	U.S. Koei Technologies / USK	Min. 4 all-electric bollards at 35” on center, 37.4” high, 5’ 2” deep
Xact Series XT-1208-RB (prev Eagle Series)	40	Ross Security Systems / ROS	
Hard Post EP-354A ST-700	40	U.S. Koei Technologies / USK	
DSC 800 Active	30	Delta Scientific / DEL	Min. set of 3 steel retractable bollards, spaced at 40" o.c. Height above grade 35". Dia. from 12.75"–13.25". Foundation depth 50.8". Decorative casting over bollard tube. Adjustable operation from 3–10 seconds. Hydraulic and pneumatic, electromechanical, manual versions can be operated by a variety of control systems. Fixed post (FP) versions are available to secure the sides of roadways with the same crash rating and appearance. Manual versions are counter balanced and lock in the up or down position.
SP 275-900	30	Gunnebo Wego GmbH / GUN	Single unit hydraulic bollard, height 36”, 6.1’ deep
Hard Post EP-354A ST-650	30	U.S. Koei Technologies / USK	Min. 2 all-electric 13.9” o.d. bollards at 36” o.c. (22.1” clear space), 25.6” high, 4’ 4” deep

Barrier Name	Barrier Rating (mph)	Designer	Description (Optional)
DS-305	50	Department of State / DOS	Granite boulder is embedded 2.03m into soil. Test article weight was 27,212 kg. Dimensions of boulder are 1.98m W x 1.63m L x 3.43m H.
DS-309D	50	Department of State / DOS	This is a design for any soil but clay soil. This design involved amended soil (soil + cement). The granite boulder is embedded 1.3m into soil + 5% cement by weight; add 0.3m of soil on top after curing to enable vegetation growth. Weight of test article was 7,257 kg. Boulder dimensions: 0.79m W x 1.14m L x 2.44m H.
DS-302	30	Department of State / DOS	This is a slab granite boulder in concrete. It is embedded 0.91m into 0.91m concrete foundation, #6 bars anchored the boulder into concrete. Test article weight was 3,815 kg. Dimensions of boulder are 0.74m W x 0.99m L x 2.03m H.
DS-304	30	Department of State / DOS	These granite boulders are cabled together below grade. Embedded 1.45m in AASHTO, 4 sets of cables were wrapped in a figure-8 configuration. Test article boulders weighed 7,150 kg ea. Dimensions: 1.14m W x 0.79m L x 2.44m H, ea. boulder.
DS-306	30	Department of State / DOS	This was half of the DS-305 boulder's size. Granite boulder is embedded 1m into soil. The weight of the test article was 13,640 kg. Boulder dimensions: 1.63m W x 1.68m L x 2m H.
DS-307B	30	Department of State / DOS	This granite boulder is resting on top of soil (no embedding). Test article weight was 6,630 kg. Dimensions of boulder: 1.6m W x 1.5m L x 1.04m H.
DS-307C	30	Department of State / DOS	This is a sandstone boulder (although a boulder of any type that otherwise satisfies these dimensions would suffice), and it is resting on top of soil (no embedding) with gravel compacted under the cervices between grade and the under-side of the boulder. Test article weight was 6,622 kg. Dimensions of boulder: 1.83m W x 1.52m L x 1.09m H.
DS-308	30	Department of State / DOS	This is a minimum mass embedded design. This granite boulder is embedded 2m into soil. The weight of the test article was 9,770 kg. Dimensions of boulder: 1.02m W x 1.04m L x 3m H.
DS-309B	30	Department of State / DOS	This is a design for any soil but clay soil. This design involved amended soil (soil + cement). The granite boulder is embedded 1.44m into soil + 5% cement by weight; add 0.3m of soil on top after curing to enable vegetation growth. Weight of test article was 7,150 kg. Boulder dimensions: 1.14m W x 0.79m L x 2.44m H.
DS-309C	30	Department of State / DOS	This design is for when you have clay soil and want to do an amended soil (soil + cement) installation. Embed granite boulder 1.31m (1m amended clayey soil on bottom, 0.31 m native clay soil on top for vegetation growth) – the amended clayey soil was 5-20% cement by weight. Dimensions of boulder are 1.12m W x 0.79m L x 2.45m H. Test article boulder's weight was 7,257 kg.
DS-310	30	Department of State / DOS	Design is called "Top & Bottom Plates with 5 Anchor Rods." Granite boulder is placed on a 1.42m high plain concrete foundation, has five holes with #14 through each. Test article weight was 3,629 kg. Boulder dimensions are 1.42m W x 0.97m L x 0.84m H.
DS-311	30	Department of State / DOS	Design name is "Top Plates w/ 5 Grouted Anchor Rods." Granite boulder is placed on a 1.42m W x 0.94m L x 1.52m H plain concrete foundation, has five grouted holes with #14. Test article weight is 3,629 kg. Boulder dimensions are 1.42m W x 0.97m L x 0.84m H.
DS-312	30	Department of State / DOS	This was a granite rectangular boulder oriented pointy end towards the threat (test truck) – AKA "Diamond Orientation". The boulder was secured onto concrete foundation via two #18 all thread bars – a 0.25m thick pedestal rested on a 1.52m W x 2.56m L x 0.61m H concrete foundation – two 0.10m dia. holes were drilled perpendicularly. Test article weight was 2,767 kg. Boulder dimensions were 0.99m W x 0.99m L x 1.0m H.

Barrier Name	Barrier Rating (mph)	Designer	Description (Optional)
DS-40	50	Department of State / DOS	Blast resistant picket fence, 10” dia. concrete filled pipes at 5’ spacing, ¾ x ¾” steel pickets at 6” on center, anchored top & bottom w/ 1” wire ropes, 11.75’ high, continuous 4’ deep foundation
DS-43 Pickett Fence	50	Department of State / DOS	9ft high anti-climb picket fence of 2x4x1/4” steel tubes; DS-43 has diagonal supports, DS-44 does not; 21" depth
DS-44 Pickett Fence	50	Department of State / DOS	9ft high anti-climb picket fence of 2x4x1/4” steel tubes; DS-43 has diagonal supports, DS-44 does not; 21" depth
DS-41 Pickett Fence	30	Department of State / DOS	9ft high anti-climb picket fence of 2x4x1/4” steel tubes; DS-41 has diagonal supports and the DS-42 does not; 21" depth
DS-42 Pickett Fence	30	Department of State / DOS	9ft high anti-climb picket fence of 2x4x1/4” steel tubes; DS-41 has diagonal supports and the DS-42 does not; 21" depth

Barrier Name	Barrier Rating (mph)	Designer	Description (Optional)
SG 1500CR High Impact Sliding Gate	50	Avon Barrier Inc. / ABI	6.2m wide, 2.2m high, 4m clear opening between two supporting columns extending 440mm into concrete slab; Electrically driven rack & pinion mechanism
Model 450 (with fence), Model 450A beam only	50	B&B ARMR / BBA	Cantilever sliding gate, 12' opening, no ground track or wheels, hydraulic, electric or manual, model 400A is beam only, model 400 height w/ fence is 108"
CG-12	50	Bad Day Fabrication	Cantilever sliding gate w/ reinforcing beam, 2 buttresses, gate panel, and guide buttresses, beam center 36" high, 12' opening, gate height 8' 2"
930 Vee Gate, Broughton Defender	50	Broughton Controls / BRC	4.23m (14') opening width, projects forward 3.14m (10'), overall width 7.6 m (25'), foundation depth 2', height above grade 2m (6.6')
DSC-288 High Security Sliding Gate	50	Delta Scientific / DEL	Shallow foundation design; Clear Openings Range from 120 to 360 inches (10 Ft to 30 Feet, 3 M to 9.1 M); Hydraulic, electro-mechanical, and manual power options. The next-gen Delta DSC288 features a shallow foundation of only 33.5 inches to avoid underground utilities conflicts and reduce the time and cost to implement.
TT-280 Gate	50	Delta Scientific / DEL	Sliding gate, motor driven rack & pinion, install length 15.6', opening 12', height 9.5', foundation depth 5'
Cable gate	50	Gibraltar Materials / GBM	Motorized sliding gate, 24' opening, mounts in 2x4" steel tubing w/ three 1 3/8" cable, height 9', top cable 45½" high, foundation depth 6', total width 42'
LSST 1000 Sliding Gate	50	Gunnebo Wego GmbH / GUN	Sliding gate, 7m (22.97 ft) clear width; 4 posts support gate, electric motor and chain guide to operate; 2 gate portions; Foundation 400 mm deep
Truck Stopper	50	Gunnebo Wego GmbH / GUN	Sliding gate w/ 13.1' opening, height 47.6", foundation depth 12"
Model IFG-14	50	Logical Decisions Inc. / LDI	Interlocking steel beam gate, 4 W200 x 46 steel beams, height 3' 6 ½" at posts, foundation depth 3' 8", opening 12'
NMSB XX	50	Nasatka / NAS	Sliding gate, 14' opening, height 9', all aluminum, on hydraulic roller system, end foundation depths 4', manual with electric hydraulic option
Model 32503 Security Gate	50	Perimeter Security Products / PRS	6' 8" high, 4' foundation depth, 13' opening w/ square framing grid of steel tubing and diagonal braces at each end, made functional after test by 1 man w/o power tools or equip.
Model 400 (with fence), Model 400A beam only	30	B&B ARMR / BBA	Cantilever sliding gate, 12' opening, no ground track or wheels, hydraulic, electric or manual, model 400A is beam only, model 400 has metal skirt at and below beam, top portion is pickets with ¾" square steel tubes at 2.5" o.c.
Fortified Impact Gate System (FIGS)	30	Tymetal Corp. / TYM	Sliding gate, 24' opening, 8x8x3/8" beam with 1" wire rope looped, diagonal structural members, height 6', RC foundation depths at ends 4'

Barrier Name	Barrier Rating (mph)	Designer	Description (Optional)
DS-60 (50 mph)	50	Department of State / DOS	Cabled/pinned surface planter, reinforced concrete, 39” high, 8ft wide, 4ft depth front-to-back, three 2” steel pegs per planter embedded 18” (asphalt), 4’ (soil), planter connected w/ 4 cables (each 5/8”), spaced at max. of 39” for 30 mph, 18” for 40 mph, and abutted and bolted for 50 mph
DS-62 (50 mph)	50	Department of State / DOS	Modular L-shaped reinforced concrete planter, 8” thick, surface mounted, no anchoring, 4’ high, filled w/ sand/soil; 30mph configuration is 4’ high x 4’ front-to-back; 50mph is 4’ high x 8’ front-to-back
DS-9	50	Department of State / DOS	Reinforced concrete planters, 9’ wide, spaced 3’ apart, embedded 36”
DS-60 (40 mph)	40	Department of State / DOS	Cabled/pinned surface planter, reinforced concrete, 39” high, 8ft wide, 4ft depth front-to-back, three 2” steel pegs per planter embedded 18” (asphalt), 4’ (soil), planter connected w/ 4 cables (each 5/8”), spaced at max. of 39” for 30 mph, 18” for 40 mph, and abutted and bolted for 50 mph
DS-60 (30 mph)	30	Department of State / DOS	Cabled/pinned surface planter, reinforced concrete, 39” high, 8ft wide, 4ft depth front-to-back, three 2” steel pegs per planter embedded 18” (asphalt), 4’ (soil), planter connected w/ 4 cables (each 5/8”), spaced at max. of 39” for 30 mph, 18” for 40 mph, and abutted and bolted for 50 mph
DS-61	30	Department of State / DOS	Same as DS-60 planter except height is extended 8" to maintain 1 meter above grade w/ embedding 8" below grade; conduits for cables and pegs are absent
DS-62 (30 mph)	30	Department of State / DOS	Modular L-shaped reinforced concrete planter, 8” thick, surface mounted, no anchoring, 4’ high, filled w/ sand/soil; 30mph configuration is 4’ high x 4’ front-to-back; 50mph is 4’ high x 8’ front-to-back

Barrier Name	Barrier Rating (mph)	Designer	Description (Optional)
DS RDAM Wall 1	50	Department of State / DOS	Rapidly Deployable Anti-ram Multi-threat (RDAM) Wall #1 Blast and Breach-resistant – At 0.25 W3 at 10 ft. it did not create a man-passable opening
DS-30	50	Department of State / DOS	Anti-ram/anti-climb reinforced concrete wall, 9’ high, 10” thick, foundation at 12” depth, 12” thick (total depth 24”)
DS-32 wall	50	Department of State / DOS	A narrow foundation anti-ram high-wall, 18 inches front to back below-grade, 43.5 inches below grade depth, 9 feet tall above grade, 10 inches wide (front to back) above grade
DS-50 Knee Wall	50	Department of State / DOS	Knee wall, reinforced concrete, 39” high, 12” thick, foundation at 12” depth, 12” thick (total depth 24”)
DS-Retaining-Wall-50	50	Department of State / DOS	
DS-Retaining-Wall-40	40	Department of State / DOS	
DS-51 Knee Wall	30	Department of State / DOS	Knee wall, reinforced concrete, 34” above grade, 12” thick, foundation total depth 18”
DS-Retaining-Wall-30	30	Department of State / DOS	

Barrier Name	Barrier Rating (mph)	Designer	Description (Optional)
Sentinel	50	ATG Access Inc / ATG	8’ wide hydraulic wedge, single hydraulic cylinder, height 38”, foundation depth 18”
Model RSB 78	50	Automatic Systems America Inc. / ASA	Hydraulic wedge w/o buttresses, height 40”, depth 36”
Model 828	50	B&B ARMR	10 ft. wedge barrier
RB1000STHB-CR Roadblocker	50	Bavak Security Group / BVS	Wedge barrier w/ steel framing, electro-mechanical w/ MOOG actuator, height 39 7/8”, 10’ wide, foundation depth 54.5”…For U.S. sales, contact Sampson Security Group.
DSC 2000	50	Delta Scientific / DEL	Min. 3 hydraulic wedges, no buttresses, each has 1” thick steel plate supported by three 1" chains, height 36”, each 24” wide, foundation depth 11”
DSC 207s	50	Delta Scientific / DEL	The barricade can be galvanized. It has a relatively small footprint. Available with Delta’s programmable drive system (PDS), this system can be electronically powered w/ an internal limit switch and multiple voltage input. The motor speed control can be programmed to control the barricade so that it operates quickly at first but, at the end of the stroke, slows down so that it does not slam, eliminating wear and noise.
DSC 501	50	Delta Scientific / DEL	1” steel plate, 9’ wide, height 39”, foundation depth 18”. The DSC-501 is raised and lowered via hydraulic cylinders driven by Delta's patent-pending hydraulic power unit.
EM HD 300	50	Delta Scientific / DEL	This is the Model HD 300 EM Phalanx (TM) Barricade System. It has a 24 inch (610 mm) foundation. Deployed barricade height is 1 M (39 inches). It has an independent electro-mechanical actuator and proprietary counterbalance system is installed in each barricade.
G2000 Wedge	50	Gibraltar Materials / GBM	Has an 8-ft. wide and a 14-ft. wide variant (both are approved)
DSP K12 Road Blocker	50	Gunnebo Wego GmbH / GUN	Electro-hydraulic wedge, plate width 14’, 39.4” high, foundation depth 60”
K12 Wedge	50	Gunnebo Wego GmbH / GUN	Hydraulic wedge w/ cylinders, plate width 13’, 47.2” high, underground housing, RC foundation, depth 15.7”; options include both open and closed face versions
K12 Wedge - CF	50	Gunnebo Wego GmbH / GUN	Hydraulic wedge w/ “closed face safety skirt”, two electrically powered cylinders, plate 13’ wide, 40” high, underground housing, RC foundation, depth 15.7”
HT1-Raptor	50	Heald Limited / HEA	Excavations are 1750mm wide x 2800mm long x 500mm deep; can be fitted to a 450mm depth; sits 435mm into ground
Viper RBSM 1000	50	Heald Limited / HEA	Hydraulic activated rising Road-Blocker, 3.0m wide with a deployed height of 1100mm, foundation depth of 400mm, and foundation size of 4125x3255mm; the blocker is equipped with a 4-stage sacrificial skirt. This is the same design as the Ross XT-2000-W (the barrier is “double-badged” in that it is produced under two different names).
HydraWedge SM50	50	HySecurity Co / HYS	
NMSB III D-E 8 ft Wedge	50	Nasatka / NAS	8' wedge barrier; the III D uses a Moog linear actuator
RSS-2000	50	Robotic Security Systems Inc. / RSS	Electric wedge in shallow steel vault, height 37”, foundation depth 24”
XT-1000-W (Xact Series)	50	Ross Security Systems / ROS	Steel plate, 5/8”, welded to 4 x 6 x ½” steel tube plus 5 chains (1- ¼”), height 36”, foundation depth 18”

Barrier Name	Barrier Rating (mph)	Designer	Description (Optional)
XT-2000-W	50	Ross Security Systems / ROS	Hydraulic activated rising Road-Blocker, 3.0m wide with a deployed height of 1100mm, foundation depth of 400mm, and foundation size of 4125x3255mm; the blocker is equipped with a 4-stage sacrificial skirt. This is the same design as the Heald Viper RBSM 1000 (the barrier is "double-badged" in that it is produced under two different names).
SW 1900 9 ft Wedge	50	Smith & Wesson / SWF	9' wedge barrier
RB650STHH-3000 Roadblocker	40	Bavak Security Group / BVS	Wedge barrier w/ steel framing, electro-hydraulic drive, height 26", foundation depth 34.5", steel frame width 10'...For U.S. sales, contact Sampson Security Group.
DSC 1200	30	Delta Scientific / DEL	Surface mounted electro-hydraulic wedge, height 35", epoxied and bolted onto existing surface, 12' opening, end buttresses, central hinged plate Needs no foundation except a cement slab, obviating concerns of interference w/ subsurface water, gas and fuel pipes, storm drains, power lines, and fiber-optic cables.