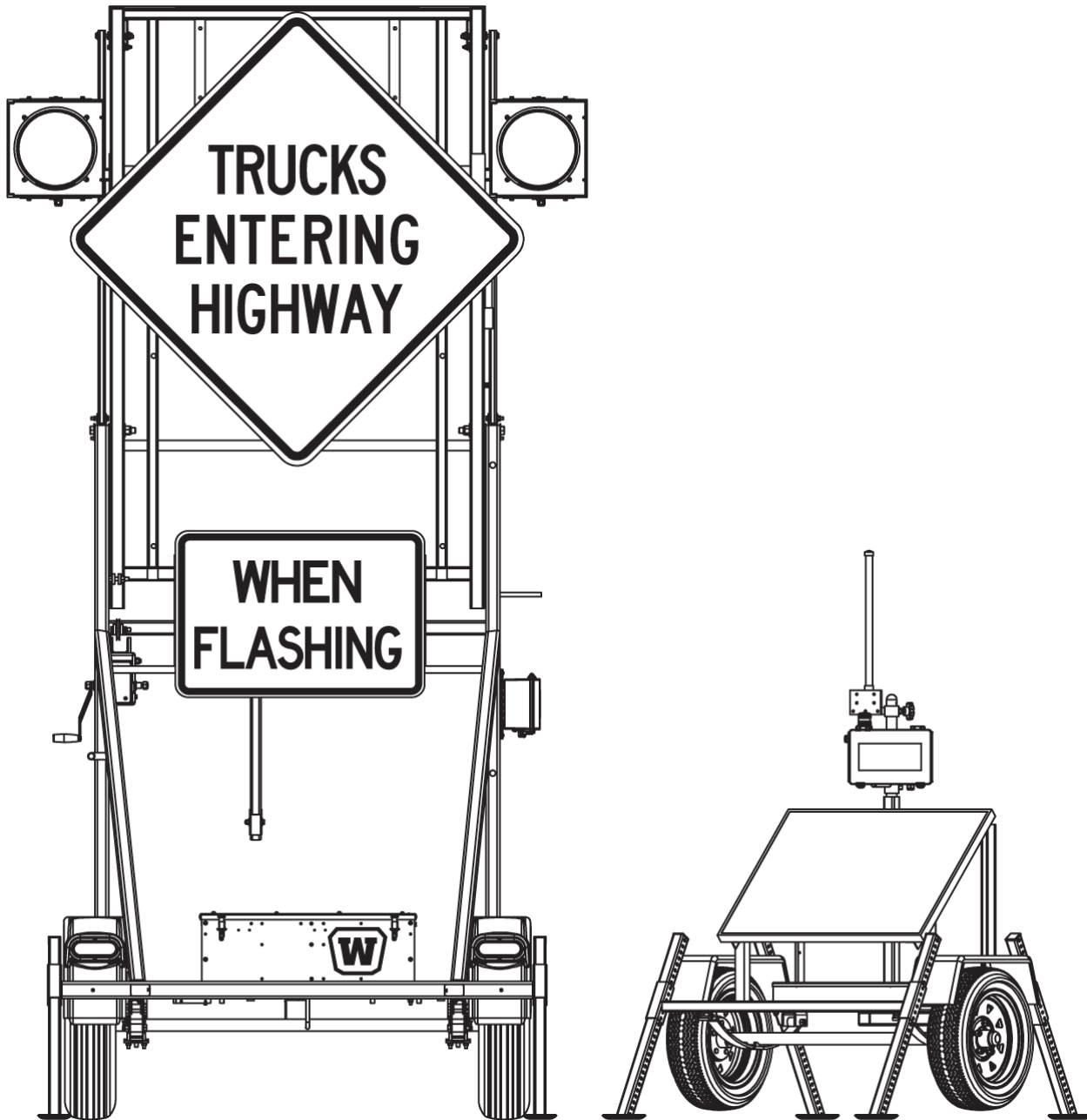


TRUCK WARNING SYSTEM

MODEL WTWS
PRODUCT SPECIFICATIONS | JULY 2024



1. SYSTEM

- 1.1. Description
- The Wanco® Trucks Entering Highway Warning System (TWS) is a portable, automated system that notifies drivers when construction vehicles are leaving a worksite and entering the highway. This intelligent traffic system acts as a precautionary measure to keep drivers and construction workers safe by helping to avoid potential collisions.
- The Wanco TWS consists of two pieces of equipment that are “paired” electronically prior to deployment: a sensor trailer, and a beacons trailer with regulatory signs. The sensor detects when construction vehicles are approaching the highway, and sends a command to activate the flashing beacons. Beacon activation is nearly instantaneous. The beacons flash alternately (one is on while the other is off) for a preset duration.
- The two trailers communicate wirelessly using a radio frequency transmitter and receiver. No cellular connection is needed between the trailers. Each trailer has independent onboard power, supplied by batteries that are charged by an automated solar-based charging system. No infrastructure is needed when using the system.
- Two models of sensor trailers use different methods for vehicle detection: either a pneumatic hose or side-fire radar.
- The system is connected in real time to the Wanco Fleet Manager service via cellular modem (when a cellular signal is available). The system logs each detection event, and this data and more can be accessed remotely using Fleet Manager. The TWS operates independently from Fleet Manager, continuously monitoring and warning drivers even if the cellular signal is interrupted. Fleet Manager can also be used to remotely configure various system settings, including setting the flashing duration and manually switching the beacons on and off.
- 1.2. Models
- 1.2.1. WTWS-SP TWS sensor trailer with pneumatic hose for vehicle detection
- 1.2.2. WTWS-SR TWS sensor trailer with radar for vehicle detection
- 1.2.3. WTWS-B TWS beacons trailer for displaying user-supplied regulatory signs
- 1.3. Temperature limits Operating temperature: –40 to 176°F (–40 to 80°C)
- 1.4. Standards The system is compliant in accordance with:
- MUTCD, December 2023
- | | |
|---------------------------------|--|
| ITE Standard, June 2007 | §5.8.2, Nighttime Dimming; §6.4.3, Environmental Tests; §6.4.6.3, Electronic Noise |
| International Protection Rating | IP54 |
| FCC | FCC part 15 class A |
- In addition, the radar sensor is also compliant with ISED Canada RSS-210

2. FEATURES

- 2.1. Setup
 - Portable system is easy to transport and deploy
 - Wireless “pairing” with a button on each trailer
 - Heavy-duty hand-winch with safety brake raises regulatory signs for deployment
 - Single locking device holds signs frame in place while operating and during transport
- 2.2. Operation
 - Beacons flash to warn motorists of trucks entering the traffic flow
 - Flashing beacons and large user-supplied signs ensure high visibility
 - Fleet Manager provides remote preset of flashing duration
 - Fleet Manager provides remote control for continuous flashing on/off
 - Pneumatic hose sensor is durable, reliable, and easy to deploy
 - Radar sensor uses nonintrusive K-band radar
 - Weather-resistant control box has lockable door panel
- 2.3. Power system
 - Energy-efficient performance for long run times and autonomous operation
 - Battery powered and solar charging
 - Solar panels charge batteries automatically without intervention
 - Charging system shuts down when batteries are fully charged, preventing damage
 - Unique system allows battery charging with solar panel or shore power
 - Cooling fan protects battery charger from overheating
 - Beacons trailer battery box can be locked to prevent unauthorized access
 - Sensor trailer battery box is bolted closed to deter tampering
- 2.4. Maintenance
 - All-welded structural steel frame ensures durability and long life
 - Durable powder-coat finish resists the elements
 - Control box can be quickly and easily replaced
 - Standard trailer tires
 - Bolt-on fenders can be replaced if damaged
- 2.5. Application

Common applications include:

 - ITS implementations
 - Highways and other high-speed arterials
 - Work zones

3. SENSOR

- 3.1. Pneumatic hose
 - 3.1.1. Function

For a sensor trailer equipped with a pneumatic hose, the hose compresses when a vehicle drives over it, triggering the control system to activate the flashing beacons
 - 3.1.2. Connection

Open end of hose fits over nipple on bottom of control box
 - 3.1.3. Terminal

Cast iron anchor seals loose end of hose and can be staked to the ground

- 3.1.4. Size 0.375 in (9.5 mm) inside diameter
- 3.1.5. Length 20 ft (6.1 m)
Custom hose lengths are available; contact factory
- 3.1.6. Material Nitrile tube with neoprene cover and fiber reinforcement
- 3.1.7. Temperature limits -29 to 212°F (-34 to 100°C)
- 3.2. Radar
- 3.2.1. Function For a sensor trailer equipped with radar, side-fire radar detects the passing of a vehicle across its path and triggers the control system to activate the flashing beacons
- 3.2.2. Sensor Microwave K-band 24.125 GHz
- 3.2.3. Location Radar head located inside control box
- 3.2.4. Detection range 90 ft (27 m)
- 3.2.5. Temperature limits -40 to 185°F (-40 to 85°C)
- 3.2.6. Standards FCC approved
CE compliant
- 3.2.7. Calibration Calibration not required

4. CONTROL SYSTEM

- 4.1. Description Activates flashing beacons when a vehicle approaching the roadway are detected
Logs detection events
Sends data to Fleet Manager when a cellular signal is available
Receives configuration settings from Fleet Manager
- 4.2. Control box
- 4.2.1. Function Control box contains system electronics
- 4.2.2. Size 12 x 8 x 5 in (30 x 20 x 13 cm), W x H x D
- 4.2.3. Material Gray polycarbonate reinforced with 10% glass fibers (PC+GF10)
- 4.2.4. Location Sensor trailer Central post on trailer frame
Beacons trailer Right (curb-side) upright of trailer frame
- 4.2.5. Door Front of control box is a door, hinged on the top, that opens fully
Two stainless steel latches hold door closed
Door can be locked with user-supplied padlock for added security

4.2.6.	Rating	Weather-resistant, comparable to IP67	
4.2.7.	Pair button	Initiates pair mode to support wireless linking of sensor trailer and beacons trailer control systems	
		Momentary switch located on bottom of control box	
4.3.	Wiring	All control system wiring routed inside liquid-tight loom, and attached with P-clamps riveted to trailer frame; no exposed wiring	
4.4.	RF transmitter and receiver		
4.4.1.	Function	Provides wireless communication from sensor control system to beacon activator module	
4.4.2.	Radio frequency	900 MHz	
4.4.3.	Broadcast range	2000 ft (610 m)	
4.5.	Cellular modem		
4.5.1.	Function	Provides remote connection between beacon activator module and Fleet Manager	
4.5.2.	Type	Compact industrial 4G LTE cellular gateway with GPS	
4.6.	Fleet Manager		
4.6.1.	Description	Web-based application for managing traffic control devices	
4.6.2.	Function	Presents real-time and historical system data, allows control of beacon behavior	
4.6.3.	System data	View	Truck detection events with time and date Beacons active/inactive with time and date Detected vehicle count Power system charging Device voltages Device signal strengths Current and historical trailer locations (on interactive Google map), with and without breadcrumb trails System device models and IDs Alarms and alerts
		Manage	Beacons flashing duration Beacons trigger direction Enable/disable continuous flashing Enable/disable alerts Add/remove geofencing

- 4.6.4. Requirements Modern standards-compliant Web browser with JavaScript enabled
A platform that supports one of these browsers (smartphone, tablet, or computer)
Internet connection

5. SENSOR TRAILER

- 5.1. Frame
 - 5.1.1. Construction All welded structural steel
 - 5.1.2. Tie-downs None
 - 5.1.3. Fenders Rectangular Jeep-style fenders, welded to trailer frame
 - 5.1.4. Finish Oven-baked, safety orange, powder-coat finish to ensure durability and corrosion protection. Assemblies are bead-blasted and then run through a five-stage, high-pressure phosphate-wash prior to application of the finish coat.

See "Options and Optional Equipment" for color options.
- 5.2. Axle assembly 550 lb (250 kg) capacity, 5 on 4.5" B.C. idler hub
- 5.3. Springs Slipper spring
- 5.4. Tires ST408/75D12 steel-belted trailer tires, load rating B
- 5.5. Drawbar Small drawbar for moving trailer around worksite

Secures with two bolts to receiver sleeve welded under trailer frame

Standard 2-inch ball coupler tow-hitch
- 5.6. Stabilizer legs
 - 5.6.1. Description Four stabilizers, one on each corner of trailer frame, extend downward from front and rear of trailer at an angle, increasing footprint size when deployed
 - 5.6.2. Adjustment Stabilizers slide up or down in sleeves, adjustable in 1" (2.54cm) increments, held in place by 3/8" (0.95cm) wire lock pin. A lanyard ties each pin to the trailer frame.
 - 5.6.3. Material
 - Leg Perforated 1½" sq. steel tube, 12 ga wall, zinc plated
 - Footpad 4" x 6" (10 x 15 cm) steel, zinc plated, all edges turned up

6. BEACONS TRAILER

- 6.1. Frame
 - 6.1.1. Construction All welded structural steel
 - 6.1.2. Tie-downs Two tie-down loops at the front corners of the trailer frame

One tie-down loop centered at rear of trailer frame

- 6.1.3. Uprights Two uprights support signs frame and beacons, reinforced by structural steel gussets and cross braces, all welded steel construction
- 6.1.4. Finish Oven-baked, safety orange, powder-coat finish to ensure durability and corrosion protection. Assemblies are bead-blasted and then run through a five-stage, high-pressure phosphate-wash prior to application of the finish coat.
See "Options and Optional Equipment" for color options.
- 6.2. Fenders Round, full wheel coverage, bolted to trailer frame, removable and replaceable
- 6.3. Axle assembly 2000 lb (907 kg) capacity, 5 on 4.5" B.C. idler hub
- 6.4. Springs Double-eye leaf springs
- 6.5. Tires ST205/75R15 steel-belted trailer tires, load rating C
- 6.6. Drawbar
 - 6.6.1. Construction Telescopes inside receiver sleeve welded under trailer frame. Removable for shipping and for added theft protection if needed. Secures with two 1/2-inch diameter bolts.
 - 6.6.2. Material 3" (7.62 cm) square steel tubing, 3/16" (0.476 cm) wall
 - 6.6.3. Jack Swivel jack, 2000 lb (907 kg) capacity, steel footpad, 10" (25 cm) total travel
 - 6.6.4. Tow hitch Standard 2-inch ball coupler tow-hitch, SAE Class 2, 3500 lb (1588 kg) capacity, bolted to drawbar, removable and replaceable
See "Options and Optional Equipment" for tow-hitch options
 - 6.6.5. Tow chains Two high-test proof coil chain assemblies, assemblies with clevis slip hooks for towing. Chains attached to drawbar with quick connectors.

Material diameter	0.406" (10.3 mm)
Working load limit	5400 lb (2450 kg)
Breaking force	16,200 lb (72 kN)
- 6.7. Stabilizer legs
 - 6.7.1. Description Four stabilizers, one on each corner of trailer frame, extend downward from front and rear of trailer at an angle, increasing footprint size when deployed
 - 6.7.2. Adjustment Stabilizers slide up or down in sleeves, adjustable in 1" (2.54cm) increments, held in place by 3/8" (0.95cm) wire lock pin. A lanyard ties each pin to the trailer frame.
 - 6.7.3. Material

Leg	Perforated 1¼" sq. steel tube, 12 ga wall, zinc plated
Footpad	4" x 6" (10 x 15 cm) steel, zinc plated, all edges turned up

6.8. Wiring

6.8.1.	Description	Wiring to connect tow vehicle and trailer for trailer taillights is installed inside drawbar, with pigtailed and connectors at both ends; no crimping required	
6.8.2.	Trailer plug	A sealed, molded, 4-square connector plugs into harness under trailer	
6.8.3.	Tow-vehicle plug	Two-piece assembly with 4-flat molded connector on harness plugs into tow vehicle Meets SAE J1239 See "Options and Optional Equipment" for tow-vehicle plug options	
6.8.4.	Protection	All trailer wiring encased in UV protective loom, and attached with P-clamps riveted to trailer frame; no exposed wires	
6.9.	Taillights	Two oval-shaped, sealed, LED, combination stop, turn and taillights integrated with fenders	
6.10.	License plate	Lighted license plate holder is mounted under rear of trailer frame	
6.11.	Reflectors	Two amber reflectors, one on the side of each upright Two red reflectors on rear trailer frame See "Options and Optional Equipment" for reflective tape	
6.12.	Signs frame		
6.12.1.	Function	Warning signs are mounted to a folding frame that pivots from horizontal (travel position) to vertical (deployed position)	
6.12.2.	Construction	All welded square steel tubing	
6.12.3.	Tilt-lock	Function	Locks signs frame in place, ensuring it cannot fall even if winch or cable were to fail. Slides up and down inside sleeve when winch is operated. Located off-center on upper crossbar between uprights. Sleeve is mounted to crossbar. Slide-bar is mounted to cross-bar on regulatory-signs frame.
		Locking pin	One 3/8" (0.95cm) wire lock pin holds slide bar and signs frame in deployed or travel position. A lanyard ties the pin to the trailer frame.
		Material	Perforated 1.75" sq. steel tube, 12 ga wall, zinc plated

6.12.4.	Winch assembly	Function	Hand-operated winch raises and lowers signs frame
		Capacity	1500 lb (680 kg)
		Brake	Safety friction-brake prevents signs frame from falling if operator loses grip on winch handle
		Cable	1/4" (6.35 mm) diameter galvanized aircraft cable
6.12.5.	Storage		When lowered for storage and transport, the signs frame (with regulatory signs attached) lies flat, parallel to the trailer length
6.13.	Regulatory signs		
6.13.1.	Function		Two user-supplied regulatory signs indicate trucks entering highway when beacons are flashing
6.13.2.	Type		One standard W11-V4 "TRUCKS ENTERING HIGHWAY" sign One non-standard W16-13P "WHEN FLASHING" plaque
6.13.3.	Sizes		Signs frame accommodates sign sizes: W11-V4 48 x 48 in (152 x 152 cm) diamond shape W16-13P 36 x 24 in (91 x 60 cm), W x H
6.13.4.	Color		Orange
6.13.5.	Location		Bolted to signs frame, large sign above and small sign below
6.14.	Beacons		
6.14.1.	Description		Two signal lights flash on and off in an alternating pattern when activated
6.14.2.	Lights	Type	LED
		Color	Amber
		Size	12 in (30 cm)
6.14.3.	Housing		Yellow polycarbonate housing with hinged front panel and tunnel visor
6.14.4.	Location		Signs frame, adjacent to top regulatory sign, one at either side of sign
6.14.5.	Flashing duration		Selectable using Fleet Manager; factory preset is 3 minutes
6.15.	Sight tube		A sight tube for aiming the trailer in desired direction is mounted to the left upright

7. POWER SYSTEM

7.1.	Description	Each trailer has an integrated power system Batteries provide system power Batteries are charged automatically by an integrated solar-based charging system	
7.2.	Battery box		
7.2.1.	Function	Holds batteries and remote charger See “Options and Optional Equipment” for heavy-duty secure battery box	
7.2.2.	Construction	Sensor trailer	Welded all-steel construction, weather-resistant Bolt-on top cover panel All parts phosphate-washed and powder-coated before assembly
		Beacons trailer	Riveted all-steel construction, weather-resistant All parts phosphate-washed and powder-coated before assembly Divider panel inside box separates batteries from electronics Hinged top panel cover with two latches that can accept user-supplied padlocks
7.2.3.	Location	Unobstructed location, centered over axle between fenders, bolted to trailer frame	
7.3.	Batteries		
7.3.1.	Sensor trailer	Description	Absorbed glass-mat (AGM) batteries
		Features	100% maintenance-free Leak- and spill-proof Faster recharge and greater freeze resistance than conventional batteries Smaller and lighter-weight than conventional batteries Contains 80% less lead when compared to conventional batteries
		Quantity	Two
		Voltage	12 Vdc each
		Weight	12.5 lb (6 kg) each
		Capacity	44 Ah total @ 12Vdc

7.3.2.	Beacons trailer	Description	Group 24 deep-cycle batteries, wired in parallel and series for a 12-volt system See “Options and Optional Equipment” for battery options
		Quantity	Four
		Voltage	6 Vdc each
		Weight	Approx. 60 lb (26 kg) each
		Capacity	430 Ah total @ 12Vdc
7.4.	Low-voltage disconnect (LVD)		To protect batteries from full discharge, the LVD system automatically shuts down power when battery voltage drops to preset level, and re-engages power when battery charge returns to optimum
7.5.	Remote charger		
7.5.1.	Sensor trailer		Remote charger not included; oversized solar panel eliminates need for external charging in virtually all applications See “Options and Optional Equipment” for remote charger option
7.5.2.	Beacons trailer		Remote AC-powered battery charger included
		Function	Plugs into a standard AC power source to recharge batteries if battery voltage drops due to lack of sun for automated solar charging system
		Type	12-volt battery charger
		Location	Inside battery box, mounted to divider panel on opposite side from batteries
		Output capacity	15A See “Options and Optional Equipment” for charger output options
		Output voltage	13.2 Vdc range “float” mode 13.6 Vdc range “absorption” mode 14.2 Vdc range “bulk” mode
		Input voltage	105 to 135 Vac, standard three-prong plug
		Input frequency	50 to 60 Hz
		Cooling	Fan cooled when charger temperature reaches 95°F (35°C)
		Protection	Automotive-style replaceable fuses

- 7.6. Solar
 - 7.6.1. Panel One high-efficiency multi-crystal photovoltaic solar module
 - 7.6.2. Location

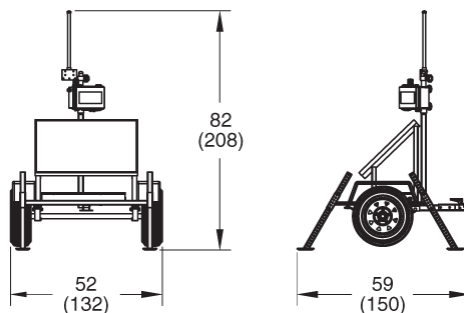
Sensor trailer	On trailer frame
Beacons trailer	Behind signs, above signs frame. No shadowing effect on any traffic-facing component. Articulated supports ensure solar panel remains flat for continuous charging regardless of folding frame position.
 - 7.6.3. Power output 100W
 See “Options and Optional Equipment” for solar power options
 - 7.6.4. Current 5.3 A max. system current
 5.4 A open short-circuit current
 - 7.6.5. Voltage 18.7 Vdc max.
 22.3 Vdc open short-circuit voltage
 - 7.6.6. Voltage regulation Charge from solar panel regulated by system power board
 - 7.6.7. Security Solar panel bolted to mounting frame with security screws and nut
- 7.7. System protection Electrical components fused and reverse-polarity protected

8. DIMENSIONS & WEIGHT

8.1. Dimensions

8.1.1. Sensor Trailer

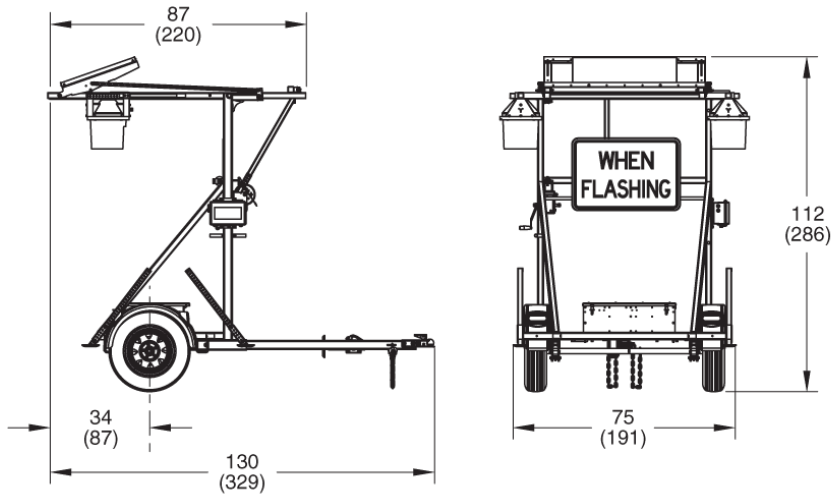
*inches
(cm)*



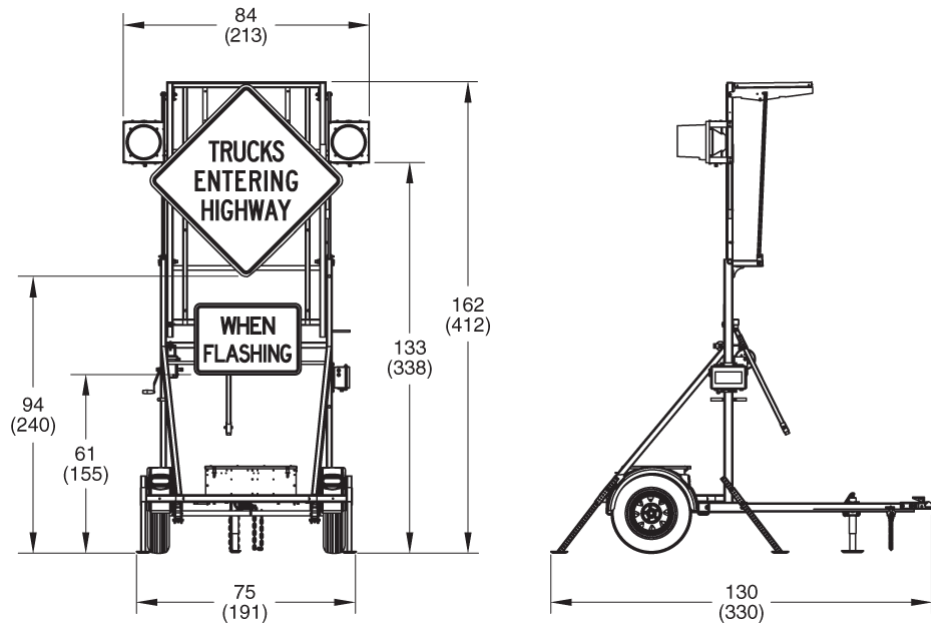
8.1.2. Beacons Trailer

*inches
(cm)*

Travel position



Deployed



8.2. Weight

- 8.2.1. Sensor Trailer Approx. 250 lb (113 kg)
- 8.2.2. Beacons Trailer Approx. 900 lb (408 kg)

9. OPTIONS AND OPTIONAL EQUIPMENT

9.1. Tow hitch

9.1.1. Combo hitch Beacons trailer only

Replace standard tow hitch with combination hitch for 2-inch ball and standard lunette ring for pintle hook, 2½" ID x 1" cross-section

9.1.2. Lunette ring Beacons trailer only

Replace standard tow hitch with lunette ring for pintle hook

Options Standard ring, 2½" ID x 1" cross-section
 Heavy-duty ring, 3" ID x 1½" cross-section

9.2. Tow-vehicle plug Beacons trailer only; sensor trailer has no taillights

Many types of plugs available, prewired at the factory; contact factory for details

9.3. Ballasted trailer deck Beacons trailer only

Structural deck adds 370 lb (168 kg) to overall weight at base of trailer, creating a low center of gravity for increased stability

9.4. Power system

9.4.1. Additional batteries Beacons trailer only

For geographic locations with less solar charging potential or colder weather, and for applications that require year-round charging, add batteries for greater capacity

Option Add two Group 24 deep-cycle batteries, 215Ah additional capacity

9.4.2. AGM batteries Beacons trailer only

Replace deep-cycle batteries with absorbed glass-mat (AGM) batteries

Options Two 4D AGM 12Vdc batteries, 400Ah total capacity
 Three 4D AGM 12Vdc batteries, 600Ah total capacity

Weight Approx. 160 lb (72 kg) each

9.4.3. 15-amp remote charger Sensor trailer only

Add optional 15-amp charger inside battery box

Charger plugs into a standard AC power source to recharge batteries if battery voltage drops due to lack of sun for automated solar charging system

Removable panel on side of battery box provides access to charger

Type 12-volt battery charger

Location Inside battery box

	Smart charger	Three-stage smart charging circuit keeps batteries fully charged and will not overcharge batteries, which help ensure the longest possible battery life
	Output capacity	2 A
	Output voltage	14.4 Vdc nominal 13.0 Vdc nominal float voltage
	Input voltage	90 to 132 Vac, standard two-prong plug
	Frequency	50 to 60 Hz
9.4.4.	45-amp remote charger	Beacons trailer only When required for faster battery charging, replace standard remote charger with higher amperage, 45-amp, 12-volt charger
9.4.5.	Solar	Beacons trailer only For geographic locations with less solar charging potential or colder weather, and for applications that require year-round charging, additional solar power is available Options include 130W, 170W, and 260W solar; contact factory for details
9.4.6.	Secure battery box	Beacons trailer only Replace standard battery box with high-security battery box Features heavy-gauge steel lid with hidden hinges; two heavy-duty, hidden-shackle puck locks
9.5.	Reflective tape	Add reflective red-and-white conspicuity tape across rear trailer frame for increased visibility
9.6.	Finish color	
9.6.1.	Sensor trailer	Specify power-coat color
9.6.2.	Beacons trailer	Specify power-coat color and, if applicable, color scheme