

Specifications: Based on a Solar Tech Trailer-Mounted 25 Lamp Silent Sentinel Arrow Board. Please include all specifications at time of bid.

Year, Make and Model of unit bid: 2018 Solar Tech AB-0525 40 Watts

	Bidder Proposes To Furnish
Consists of an arrow display panel, a supporting structure for the display panel, photovoltaic array, a battery power supply and an electronic control console, all mounted on a heavy duty trailer frame.	COMPLY
Shall have a high contrast arrow display panel with long life expectancy, high reliability LED lamp technology.	COMPLY
Shall meet or exceed the standards for Arrow Boards as listed with the U.S. Federal Highway Administration Manual on Uniform Traffic Control Devices.	COMPLY
Manufacturer shall have a factory authorized service center located within 150 miles of point of delivery. Delivery directly from a manufacturer's facility without inspection and prep by an authorized service center shall not be permitted. Additionally, authorized service center shall be capable of performing warranty repairs, and shall provide on-site training on use and maintenance of all equipment.	NO TRAINING PROVIDED AND NO SERVICE CENTER WITHIN 150 MILES
Length Overall - 100".	COMPLY
Overall width - 96".	COMPLY
Across Fenders - 74".	COMPLY
Overall height in transport position - 92".	COMPLY
Overall height in operating position - 134".	COMPLY
Ground Clearance, minimum - 13 1/2".	COMPLY
Weight approximately 1200# (please specify).	COMPLY
Transport position maximum towing speed 70 MPH.	COMPLY
Operating position @ max. height, outriggers in place 80 mph sustained Wind.	COMPLY

	Bidder Proposes To Furnish
Electrical interference – unaffected by RFI and EMI.	<u>COMPLY</u>
Trailer frame shall be constructed of a welded 3/16" CNC formed steel plate and structural steel tubing with a 3x3x3/16" structural steel tubing receiver for the tongue, reinforced and welded to the front crossmember.	<u>COMPLY</u>
Trailer tongue shall consist of 2 ½ x 2 ½ x 3/16" structural steel tubing. The tongue shall bolt into the receiver to facilitate ease of removal. Also to be equipped with a swivel type screw jack with a formed foot pad.	<u>COMPLY</u>
Trailer tongue shall be equipped with an adjustable height coupler with provisions for a 3" pintle ring.	<u>COMPLY</u>
Trailer shall be equipped with ¼" safety chains with snap type hooks.	<u>COMPLY</u>
Paint shall consist of a polyimide epoxy primer with a minimum dry thickness of 2.5 mils or comparable please specify.	<u>COMPLY</u>
Final color to be a high gloss acrylic urethane finish and applied to a dry film thickness of 2.5 mils safety orange or yellow acceptable (specify).	<u>COMPLY</u>
Trailer shall be equipped with sealed flush mounted stop, turn, tail lights.	<u>COMPLY</u>
Trailer shall be equipped with a lighted license plate holder.	<u>COMPLY</u>
Trailer wiring harness shall be completely sealed and water resistant.	<u>COMPLY</u>
Trailer shall be equipped with unbreakable, molded, solid color fenders completely closed on the inside. Fenders shall be mounted with a zinc or stainless hardware.	<u>COMPLY</u>
Trailer shall be equipped with four telescoping jacks consisting of 2x2" x 12 gauge galvanized steel tubing with a 3 x 3 x 3/16" x 6" wide steel foot plate.	<u>COMPLY</u>
Jack stands shall be configured such that, when in operating position, they create a footprint of at least 93", front to rear and 56" side to side to provide adequate stability of unit in high winds.	<u>COMPLY</u>
Wheels shall be a 13" 5 lug pattern (4 ½" bolt circle), white spoke with B78-13 load range C tires.	<u>COMPLY</u>

**Bidder Proposes
To Furnish**

Trailer superstructure shall provide complete support of the arrow panel in the transport (down) position. Cantilevered support of the arrow panel is unacceptable.

COMPLY

All aluminum to steel attachments shall be made with stainless steel hardware and stainless or nylon spacers to minimize corrosion.

COMPLY

Arrow panel lifting mechanism shall consist of a minimum 1,000 pound capacity, automatic brake type winch with 1/4 " wire rope capable of holding the arrow panel in any position from full upright to down.

COMPLY

Winch shall be zinc plated to minimize corrosion.

COMPLY

Winch shall be designed for handle removal for security while not interfering with the automatic brake operation.

COMPLY

Arrow panel to be an overall width of 96".

COMPLY

Arrow board to have an overall height of 48".

COMPLY

Arrow board to have an overall depth of 3".

COMPLY

Arrow panel frame including braces shall consist of 3 x 1 x 1/8" aluminum alloy channel, welded at corners and internal braces.

COMPLY

Front and rear surfaces shall consist of a .063" aluminum alloy sheet with a baked matte black enamel finish.

COMPLY

Arrow panel shall be equipped with a light sensing device to monitor ambient light and provide information to the control module to regulate the intensity of the arrow lamps.

COMPLY

Arrow panel shall be equipped with 25 lamps, approximately 5" in diameter.

COMPLY

Arrow panel lamps shall consist of an array of at least 21 LEDs mounted in a weather resistant high impact polycarbonate housing.

COMPLY

The arrow panel lamp housing shall be completely sealed to protect the internal components from harsh environmental conditions.

COMPLY

**Bidder Proposes
To Furnish**

The lamps shall provide an Approximate Initial Maximum Beam Candlepower of 1000 candela typical, 750 candela minimum, over an operating range of 10.7 to 16.0 VDC. The lamp intensity shall remain constant over the entire operating voltage range.

COMPLY

The color of the light produced by the lamps shall be amber.

COMPLY

The lamps shall have a minimum life expectancy of 100,000 hours.

COMPLY

Arrow panel lamps shall be secured to the arrow panel by a black, molded impact resistant shroud, approximately 5" in diameter and approximately 4" high. Lamp shroud shall mount to the panel with stainless screws through keyholes such that the shroud and the lamp can be removed from the panel without the need to remove the screws from the panel.

COMPLY

Arrow panel lamps shall be keyed to the shroud and the shroud shall be keyed to the front panel so lamps are secured to front panel with proper lamp orientation.

COMPLY

The rear of the arrow panel shall be equipped with three ultra-bright LEDs, in water tight housings, to indicate the arrow panel pattern currently being displayed to provide a visual indication to individuals in the work zone that the arrow board is functioning properly.

COMPLY

Arrow panel to be equipped with a watertight connector to allow "quick" detach for serviceability. Cable shall be suitable for outdoor use and completely sealed against moisture. Arrow panel control cable connector shall be equipped with gold flash pins to provide maximum conductivity.

COMPLY

Control module shall consist of a totally solid state fully integrated device which provides control of the arrow sign panel, lamp pattern generation, battery status monitoring and indication, solar electric charge control, low battery voltage disconnect, high battery voltage disconnect, reverse battery polarity and surge protection.

COMPLY

Control module shall be enclosed in a weather protected, lockable, and molded High density Polyethylene enclosure secured to the trailer chassis.

COMPLY

Control module front panel shall be completely sealed to accommodate operation in all types of weather.

COMPLY

**Bidder Proposes
To Furnish**

Control module shall be equipped with multi colored LED indicators for monitoring battery charge level, solar charger activity, and lamp intensity control settings.

COMPLY

Control module power consumption, not including lamps, shall be less than 0.5 Watts to optimize overall energy consumption.

COMPLY

Control module operating firmware shall be field upgradeable.

COMPLY

Operating voltage – 12 Volts DC nominal.

COMPLY

Main power switch shall be unnecessary, when arrow pattern selection switch is in the OFF position, the control module shall automatically shut down all unnecessary operations to reduce energy consumption to less than 0.05 Watts. Solar generator charge controller shall operate automatically, as required, during daylight hours and shut down completely at night.

COMPLY

Batteries shall consist of (4) four 6-Volt Gel-Cel Heavy Duty Deep Cycle.

COMPLY

Shall have 520 Amp-Hours energy capacity to operate the arrow panel, displaying a single flashing arrow for more than 30 days, without any energy input from the solar array.

COMPLY

Battery/Equipment Compartments to be constructed of High Molecular Weight Polyethylene.

COMPLY

Solar Array power output of 80 Watts.

COMPLY

Entire unit shall tilt back and rest on jack stands for ease of cleaning and maintenance.

COMPLY

Solar array energy output shall be sufficient to operate the arrow sign, under normal operating conditions, with the solar array in a flat, horizontal position. It shall not be necessary to tilt or rotate the solar array to provide sufficient energy output from the solar array to operate the arrow panel continuously.

COMPLY

Solar power system shall include a solid state charge controller.

COMPLY

**Bidder Proposes
To Furnish**

Charge controller shall monitor battery voltage and ambient temperature.	<u>COMPLY</u>
Charge controller shall regulate energy flow from the solar array into the battery bank so as to avoid over charging of the batteries.	<u>COMPLY</u>
Shall have a standard "Bumper to Bumper" 5 year warranty.	<u>COMPLY</u>
Charger type- Switching regulator, constant voltage with automatic switch to maintenance or trickle charge.	<u>COMPLY</u>
Shall be a 110 Volt, 45 Amp battery charger that shall install in the field with minimal effort.	<u>COMPLY</u>
Adjustable height coupler shall accept a 2" ball coupler or a 3" pintle ring.	<u>COMPLY</u>
Trailer to be equipped with a Traffic Cone Carrier.	<u>COMPLY</u>

Bidder - Please complete and return

BID PAGE

Supply a Solar-Powered Trailer-Mounted Arrow Board to the City of Traverse City

Price quoted shall include title fee, any documentation fee, and all transportation (delivery) charges fully prepaid to the City Garage, 625 Woodmere Ave. Traverse City, MI 49686

MAKE, YEAR, AND MODEL OF EQUIPMENT BID: 2018 Solar Tech AB-0525 40 Watts

COST OF SPECIFIED EQUIPMENT: \$ \$12,389.00

***Please see our Equipment Proposal TII/MI/0318/8192 attached.

EXPECTED DELIVERY DATE: Estimated 30-50 Days ARO & Approved Submittal
(Length of time after receipt of purchase order)

Submitted by:



Signature

Technology International, Inc.

Company Name

Rifat Habib, Business Development Exec.

Name and Title (Print)

1349 South International Pkwy, Suite 2411,

Company Address

(407) 359-2373

Phone

(407) 359-2372

Fax

Lake Mary

City,

Florida

State,

32746

Zip

EMAIL ADDRESS:

tii@tii-usa.com

Corporation

Sole proprietorship/partnership/corporation

FL

If corporation, state of corporation



Technology International, Inc.
 1349 South International Pkwy, Suite 2411
 Lake Mary, FL 32746
 Tel: (407) 359-2373
 Fax: (407) 359-2372
 E-mail: tii@tii-usa.com
 Website: www.tii-usa.com

Equipment Proposal

Title: Solar-Powered Trailer-Mounted Arrow Board

Attention: The City of Traverse City
 Office of the City Manager
 Second floor, Governmental Center,
 400 Boardman Avenue,
 Traverse City, MI 49684
 Tel: (231) 922-4440

Our Ref: TII/MI/0318/8192

Date: 03/20/2018

In response to your quote request for Solar-Powered Trailer-Mounted Arrow Board, Technology International, Inc. is pleased to submit the following for consideration:

ITEM NO.	QTY	DESCRIPTION/ MODEL NO.	UNIT PRICE	EXTD. PRICE
1	1	EQAB-ST-AB-0525 Solar Tech AB-0525 40 Watt 25 Lamp Arrowboard <u>Includes:</u> (1) Non-Inventory-Item Upgrade to BOW Solar Array (1) Non-Inventory-Item Upgrade to 4 Maintenance Free Batteries (Gel-Cell) (1) Non-Inventory-Item Traffic Cone Carrier	\$12,389.00	\$12,389.00
See attached data sheets				
<u>Total price for all above.....</u>			<u>\$12,389.00</u>	

Exclusions: Any item not included in our offer.

Warranty: Manufacturer's Standard warranty applies.

Delivery:

- Estimated delivery is **30-50 DAYS** after receipt of order from customer and approved submittal
- All delivery dates quoted are tentative, based on current factory production schedule, subject to confirmation at time of order
- Submittal data, if applicable, will be provided for approval ARO

Freight: Freight included to Traverse City, MI 49686

Payment Terms: 1/4% 10 days; NET 30

Validity of Quote: This quotation is valid for 30 days from date of quote.

***** Notes:** TII will deliver good title (MSO) to the Agency at the time of delivery. The Agency is responsible for its own title work and registration.

Technology International, Inc. Corporate data:

We are a small business and our Tax Payer Identification Number (TIN): 650342335. The above price quoted does not include any sales, excise or similar taxes. If applicable agency must accrue and remit it directly.

We trust that this proposal will meet your requirements and we look forward to hearing from you.

If you have any questions or need more information, please contact us by phone at 407-359-2373, fax at 407-359-2372 or email us at tii@tii-usa.com

Respectfully submitted,



Rifat Habib
Business Development Executive
Technology International, Inc.

Specifications: Based on a Solar Tech Trailer-Mounted 25 Lamp Silent Sentinel Arrow Board. Please include all specifications at time of bid.

Year, Make and Model of unit bid: 2018 Work Area Protection Cup WAAW 25 LED STD M90E2 25 Light Arrow Board

Bidder Proposes To Furnish

Consists of an arrow display panel, a supporting structure for the display panel, photovoltaic array, a battery power supply and an electronic control console, all mounted on a heavy duty trailer frame.

Yes

Shall have a high contrast arrow display panel with long life expectancy, high reliability LED lamp technology.

Yes

Shall meet or exceed the standards for Arrow Boards as listed with the U.S. Federal Highway Administration Manual on Uniform Traffic Control Devices.

Yes

Manufacturer shall have a factory authorized service center located within 150 miles of point of delivery. Delivery directly from a manufacturer's facility without inspection and prep by an authorized service center shall not be permitted. Additionally, authorized service center shall be capable of performing warranty repairs, and shall provide on-site training on use and maintenance of all equipment.

Exception 180 miles

Length Overall - 100".

Yes

Overall width - 96".

Yes

Across Fenders - 74".

Exception 68"

Overall height in transport position - 92".

Yes

Overall height in operating position - 134".

Exception 142"

Ground Clearance, minimum - 13 1/2".

Exception 12"

Weight approximately 1200# (please specify).

1000#

Transport position maximum towing speed 70 MPH.

Yes

Operating position @ max. height, outriggers in place 80 mph sustained Wind.

Yes

**Bidder Proposes
To Furnish**

Electrical interference – unaffected by RFI and EMI.

Yes

Trailer frame shall be constructed of a welded 3/16" CNC formed steel plate and structural steel tubing with a 3x3x3/16" structural steel tubing receiver for the tongue, reinforced and welded to the front crossmember.

Exception No CNC Formed Plate

Trailer tongue shall consist of 2 1/2 x 2 1/2 x 3/16" structural steel tubing. The tongue shall bolt into the receiver to facilitate ease of removal. Also to be equipped with a swivel type screw jack with a formed foot pad.

Yes

Trailer tongue shall be equipped with an adjustable height coupler with provisions for a 3" pintle ring.

Yes Option 239387

Trailer shall be equipped with 1/4" safety chains with snap type hooks.

Yes

Paint shall consist of a polyamide epoxy primer with a minimum dry thickness of 2.5 mils or comparable please specify.

Exception Powder Coat

Final color to be a high gloss acrylic urethane finish and applied to a dry film thickness of 2.5 mils safety orange or yellow acceptable (specify).

Exception Powder Coat

Trailer shall be equipped with sealed flush mounted stop, turn, tail lights.

Yes

Trailer shall be equipped with a lighted license plate holder.

Yes

Trailer wiring harness shall be completely sealed and water resistant.

Yes

Trailer shall be equipped with unbreakable, molded, solid color fenders completely closed on the inside. Fenders shall be mounted with a zinc or stainless hardware.

Yes

Trailer shall be equipped with four telescoping jacks consisting of 2x2" x 12 gauge galvanized steel tubing with a 3 x 3 x 3/16" x 6" wide steel foot plate.

Exception 1 3/4" x 1 3/4" Self Leveling Foot

Jack stands shall be configured such that, when in operating position, they create a footprint of at least 93", front to rear and 56" side to side to provide adequate stability of unit in high winds.

Yes

Wheels shall be a 13" 5 lug pattern (4 1/2" bolt circle), white spoke with B78-13 load range C tires.

Exception 14" wheels

**Bidder Proposes
To Furnish**

Trailer superstructure shall provide complete support of the arrow panel in the transport (down) position. Cantilevered support of the arrow panel is unacceptable.

Yes

All aluminum to steel attachments shall be made with stainless steel hardware and stainless or nylon spacers to minimize corrosion.

Yes

Arrow panel lifting mechanism shall consist of a minimum 1,000 pound capacity, automatic brake type winch with 1/4 " wire rope capable of holding the arrow panel in any position from full upright to down.

Yes

Winch shall be zinc plated to minimize corrosion.

Yes

Winch shall be designed for handle removal for security while not interfering with the automatic brake operation.

Yes

Arrow panel to be an overall width of 96".

Yes

Arrow board to have an overall height of 48".

Yes

Arrow board to have an overall depth of 3".

Yes

Arrow panel frame including braces shall consist of 3 x 1 x 1/8" aluminum alloy channel, welded at corners and internal braces.

Yes

Front and rear surfaces shall consist of a .063" aluminum alloy sheet with a baked matte black enamel finish.

Exception Powder Coated Orange

Arrow panel shall be equipped with a light sensing device to monitor ambient light and provide information to the control module to regulate the intensity of the arrow lamps.

Yes

Arrow panel shall be equipped with 25 lamps, approximately 5" in diameter.

Yes

Arrow panel lamps shall consist of an array of at least 21 LEDs mounted in a weather resistant high impact polycarbonate housing.

Yes

The arrow panel lamp housing shall be completely sealed to protect the internal components from harsh environmental conditions.

Yes

**Bidder Proposes
To Furnish**

The lamps shall provide an Approximate Initial Maximum Beam Candlepower of 1000 candela typical, 750 candela minimum, over an operating range of 10.7 to 16.0 VDC. The lamp intensity shall remain constant over the entire operating voltage range.

Yes

The color of the light produced by the lamps shall be amber.

Yes

The lamps shall have a minimum life expectancy of 100,000 hours.

Yes

Arrow panel lamps shall be secured to the arrow panel by a black, molded impact resistant shroud, approximately 5" in diameter and approximately 4" high. Lamp shroud shall mount to the panel with stainless screws through keyholes such that the shroud and the lamp can be removed from the panel without the need to remove the screws from the panel.

Yes

Arrow panel lamps shall be keyed to the shroud and the shroud shall be keyed to the front panel so lamps are secured to front panel with proper lamp orientation.

Yes

The rear of the arrow panel shall be equipped with three ultra-bright LEDs, in water tight housings, to indicate the arrow panel pattern currently being displayed to provide a visual indication to individuals in the work zone that the arrow board is functioning properly.

Yes

Arrow panel to be equipped with a watertight connector to allow "quick" detach for serviceability. Cable shall be suitable for outdoor use and completely sealed against moisture. Arrow panel control cable connector shall be equipped with gold flash pins to provide maximum conductivity.

Yes

Control module shall consist of a totally solid state fully integrated device which provides control of the arrow sign panel, lamp pattern generation, battery status monitoring and indication, solar electric charge control, low battery voltage disconnect, high battery voltage disconnect, reverse battery polarity and surge protection.

Yes

Control module shall be enclosed in a weather protected, lockable, and molded High density Polyethylene enclosure secured to the trailer chassis.

Exception Metal Enclosure

Control module front panel shall be completely sealed to accommodate operation in all types of weather.

Yes

**Bidder Proposes
To Furnish**

Control module shall be equipped with multi colored LED indicators for monitoring battery charge level, solar charger activity, and lamp intensity control settings.

Yes

Control module power consumption, not including lamps, shall be less than 0.5 Watts to optimize overall energy consumption.

Yes

Control module operating firmware shall be field upgradeable.

Exception Not Field Upgradeable

Operating voltage – 12 Volts DC nominal.

Yes

Main power switch shall be unnecessary, when arrow pattern selection switch is in the OFF position, the control module shall automatically shut down all unnecessary operations to reduce energy consumption to less than 0.05 Watts. Solar generator charge controller shall operate automatically, as required, during daylight hours and shut down completely at night.

Yes
Exception (4) Four 12V 18AH SLA Batteries

Batteries shall consist of (4) four 6-Volt Gel-Cel Heavy Duty Deep Cycle.

Shall have 520 Amp-Hours energy capacity to operate the arrow panel, displaying a single flashing arrow for more than 30 days, without any energy input from the solar array.

Exception 72 Amp Hour

Battery/Equipment Compartments to be constructed of High Molecular Weight Polyethylene.

Exception Metal Enclosure

Solar Array power output of 80 Watts.

Exception 40 Watts

Entire unit shall tilt back and rest on jack stands for ease of cleaning and maintenance.

Yes

Solar array energy output shall be sufficient to operate the arrow sign, under normal operating conditions, with the solar array in a flat, horizontal position. It shall not be necessary to tilt or rotate the solar array to provide sufficient energy output from the solar array to operate the arrow panel continuously.

Yes

Solar power system shall include a solid state charge controller.

Yes

**Bidder Proposes
To Furnish**

Charge controller shall monitor battery voltage and ambient temperature.	<u>Yes</u>
Charge controller shall regulate energy flow from the solar array into the battery bank so as to avoid over charging of the batteries.	<u>Yes</u>
Shall have a standard "Bumper to Bumper" 5 year warranty.	<u>Yes</u>
Charger type- Switching regulator, constant voltage with automatic switch to maintenance or trickle charge.	<u>Yes</u>
Shall be a 110 Volt, 45 Amp battery charger that shall install in the field with minimal effort.	<u>Yes</u>
Adjustable height coupler shall accept a 2" ball coupler or a 3" pintle ring.	<u>Yes</u>
Trailer to be equipped with a Traffic Cone Carrier.	<u>Exception</u>

Bidder - Please complete and return

BID PAGE

Supply a Solar-Powered Trailer-Mounted Arrow Board to the City of Traverse City

Price quoted shall include title fee, any documentation fee, and all transportation (delivery) charges fully prepaid to the City Garage, 625 Woodmere Ave. Traverse City, MI 49686

MAKE, YEAR, AND MODEL OF EQUIPMENT BID: 2018 Work Area Protection Corp
WPAW25LEA STD-M90EZ 25 Light Arrowmaster

COST OF SPECIFIED EQUIPMENT: \$ 4450.00

EXPECTED DELIVERY DATE: 2-3 weeks
(Length of time after receipt of purchase order)

Submitted by:

David R. Lightle
Signature

Lightle Enterprises of Ohio, LLC
Company Name

David R. Lightle
Name and Title (Print)

P.O. Box 329
Company Address

740-998-5363 740-998-5364
Phone Fax

Frankfort OH 45624
City, State, Zip

EMAIL ADDRESS:

Partnership
Sole proprietorship/partnership/corporation

dlightle@lightleenterprises.com

If corporation, state of corporation

Specifications: Based on a Solar Tech Trailer-Mounted 25 Lamp Silent Sentinel Arrow Board. Please include all specifications at time of bid.

Year, Make and Model of unit bid: NATIONAL SIGNAL, INC., 2018 ARO LITE CURVE

**Bidder Proposes
To Furnish**

Consists of an arrow display panel, a supporting structure for the display panel, photovoltaic array, a battery power supply and an electronic control console, all mounted on a heavy duty trailer frame.	<u>YES</u>
Shall have a high contrast arrow display panel with long life expectancy, high reliability LED lamp technology.	<u>YES</u>
Shall meet or exceed the standards for Arrow Boards as listed with the U.S. Federal Highway Administration Manual on Uniform Traffic Control Devices.	<u>YES</u>
Manufacturer shall have a factory authorized service center located within 150 miles of point of delivery. Delivery directly from a manufacturer's facility without inspection and prep by an authorized service center shall not be permitted. Additionally, authorized service center shall be capable of performing warranty repairs, and shall provide on-site training on use and maintenance of all equipment.	<u>YES</u>
Length Overall - 100".	<u>114"</u>
Overall width - 96".	<u>96"</u>
Across Fenders - 74".	<u>75"</u>
Overall height in transport position - 92".	<u>90"</u>
Overall height in operating position - 134".	<u>140"</u>
Ground Clearance, minimum - 13 1/2".	<u>YES</u>
Weight approximately 1200# (please specify).	<u>1000 LBS</u>
Transport position maximum towing speed 70 MPH.	<u>YES</u>
Operating position @ max. height, outriggers in place 80 mph sustained Wind.	<u>65 MPH</u>

**Bidder Proposes
To Furnish**

Electrical interference – unaffected by RFI and EMI.

YES

Trailer frame shall be constructed of a welded 3/16” CNC formed steel plate and structural steel tubing with a 3x3x3/16” structural steel tubing receiver for the tongue, reinforced and welded to the front crossmember.

2" X 3" X 3/16"
STEEL TUBING
WITH
3" X 3" X 3/16"
RECEIVER

Trailer tongue shall consist of 2 ½ x 2 ½ x 3/16” structural steel tubing. The tongue shall bolt into the receiver to facilitate ease of removal. Also to be equipped with a swivel type screw jack with a formed foot pad.

3" X 3" X 3/16"

Trailer tongue shall be equipped with an adjustable height coupler with provisions for a 3” pintle ring.

YES

Trailer shall be equipped with ¼” safety chains with snap type hooks.

YES

Paint shall consist of a polyimide epoxy primer with a minimum dry thickness of 2.5 mils or comparable please specify.

POWDER BASE COAT
WITH CLEAR POWDER
BASE

Final color to be a high gloss acrylic urethane finish and applied to a dry film thickness of 2.5 mils safety orange or yellow acceptable (specify).

YES

Trailer shall be equipped with sealed flush mounted stop, turn, tail lights.

MOUNTED ON SHEET
METAL GAURD

Trailer shall be equipped with a lighted license plate holder.

YES

Trailer wiring harness shall be completely sealed and water resistant.

YES

Trailer shall be equipped with unbreakable, molded, solid color fenders completely closed on the inside. Fenders shall be mounted with a zinc or stainless hardware.

FORMED STEEL
BOLT ON FENDERS

Trailer shall be equipped with four telescoping jacks consisting of 2x2” x 12 gauge galvanized steel tubing with a 3 x 3 x 3/16” x 6” wide steel foot plate.

2 X 2 X 1/8" TUBE
3 X 3 X 1/8 FOOT PLATE

Jack stands shall be configured such that, when in operating position, they create a footprint of at least 93”, front to rear and 56” side to side to provide adequate stability of unit in high winds.

YES

Wheels shall be a 13” 5 lug pattern (4 ½” bolt circle), white spoke with B78-13 load range C tires.

ST 205/15-D15

**Bidder Proposes
To Furnish**

Trailer superstructure shall provide complete support of the arrow panel in the transport (down) position. Cantilevered support of the arrow panel is unacceptable.

YES

All aluminum to steel attachments shall be made with stainless steel hardware and stainless or nylon spacers to minimize corrosion.

ZINC PLATED FASTENERS

Arrow panel lifting mechanism shall consist of a minimum 1,000 pound capacity, automatic brake type winch with 1/4 " wire rope capable of holding the arrow panel in any position from full upright to down.

YES

Winch shall be zinc plated to minimize corrosion.

YES

Winch shall be designed for handle removal for security while not interfering with the automatic brake operation.

YES

Arrow panel to be an overall width of 96".

YES

Arrow board to have an overall height of 48".

YES

Arrow board to have an overall depth of 3".

YES

Arrow panel frame including braces shall consist of 3 x 1 x 1/8" aluminum alloy channel, welded at corners and internal braces.

YES

Front and rear surfaces shall consist of a .063" aluminum alloy sheet with a baked matte black enamel finish.

YES

Arrow panel shall be equipped with a light sensing device to monitor ambient light and provide information to the control module to regulate the intensity of the arrow lamps.

YES

Arrow panel shall be equipped with 25 lamps, approximately 5" in diameter.

YES

Arrow panel lamps shall consist of an array of at least 21 LEDs mounted in a weather resistant high impact polycarbonate housing.

YES

The arrow panel lamp housing shall be completely sealed to protect the Internal components from harsh environmental conditions.

YES

**Bidder Proposes
To Furnish**

The lamps shall provide an Approximate Initial Maximum Beam Candlepower of 1000 candela typical, 750 candela minimum, over an operating range of 10.7 to 16.0 VDC. The lamp intensity shall remain constant over the entire operating voltage range.

YES

The color of the light produced by the lamps shall be amber.

YES

The lamps shall have a minimum life expectancy of 100,000 hours.

YES

Arrow panel lamps shall be secured to the arrow panel by a black, molded impact resistant shroud, approximately 5” in diameter and approximately 4” high. Lamp shroud shall mount to the panel with stainless screws through keyholes such that the shroud and the lamp can be removed from the panel without the need to remove the screws from the panel.

YES

Arrow panel lamps shall be keyed to the shroud and the shroud shall be keyed to the front panel so lamps are secured to front panel with proper lamp orientation.

YES

The rear of the arrow panel shall be equipped with three ultra-bright LEDs, in water tight housings, to indicate the arrow panel pattern currently being displayed to provide a visual indication to individuals in the work zone that the arrow board is functioning properly.

YES

Arrow panel to be equipped with a watertight connector to allow “quick” detach for serviceability. Cable shall be suitable for outdoor use and completely sealed against moisture. Arrow panel control cable connector shall be equipped with gold flash pins to provide maximum conductivity.

YES

Control module shall consist of a totally solid state fully integrated device which provides control of the arrow sign panel , lamp pattern generation, battery status monitoring and indication, solar electric charge control, low battery voltage disconnect, high battery voltage disconnect, reverse battery polarity and surge protection.

YES

Control module shall be enclosed in a weather protected, lockable, and molded High density Polyethylene enclosure secured to the trailer chassis.

ALUMINUM SHEET
METAL WITH POWDER
COAT FINISH

Control module front panel shall be completely sealed to accommodate operation in all types of weather.

YES

**Bidder Proposes
To Furnish**

Control module shall be equipped with multi colored LED indicators for monitoring battery charge level, solar charger activity, and lamp intensity control settings.

LED'S ARE
ONE COLOR

Control module power consumption, not including lamps, shall be less than 0.5 Watts to optimize overall energy consumption.

YES

Control module operating firmware shall be field upgradeable.

NO

Operating voltage – 12 Volts DC nominal.

YES

Main power switch shall be unnecessary, when arrow pattern selection switch is in the OFF position, the control module shall automatically shut down all unnecessary operations to reduce energy consumption to less than 0.05 Watts. Solar generator charge controller shall operate automatically, as required, during daylight hours and shut down completely at night.

YES

Batteries shall consist of (4) four 6-Volt Gel-Cel Heavy Duty Deep Cycle.

2 BATTERIES

Shall have 520 Amp-Hours energy capacity to operate the arrow panel, displaying a single flashing arrow for more than 30 days, without any energy input from the solar array.

YES

Battery/Equipment Compartments to be constructed of High Molecular Weight Polyethylene.

SHEET METAL
WITH POWDER COAT

Solar Array power output of 80 Watts.

YES

Entire unit shall tilt back and rest on jack stands for ease of cleaning and maintenance.

YES

Solar array energy output shall be sufficient to operate the arrow sign, under normal operating conditions, with the solar array in a flat, horizontal position. It shall not be necessary to tilt or rotate the solar array to provide sufficient energy output from the solar array to operate the arrow panel continuously.

YES

Solar power system shall include a solid state charge controller.

YES

**Bidder Proposes
To Furnish**

Charge controller shall monitor battery voltage and ambient temperature.	<u>YES</u>
Charge controller shall regulate energy flow from the solar array into the battery bank so as to avoid over charging of the batteries.	<u>YES</u>
Shall have a standard "Bumper to Bumper" 5 year warranty.	<u>YES</u>
Charger type- Switching regulator, constant voltage with automatic switch to maintenance or trickle charge.	<u>YES</u>
Shall be a 110 Volt, 45 Amp battery charger that shall install in the field with minimal effort.	<u>YES</u>
Adjustable height coupler shall accept a 2" ball coupler or a 3" pintle ring.	<u>YES</u>
Trailer to be equipped with a Traffic Cone Carrier.	<u>YES</u>

Bidder - Please complete and return

BID PAGE

Supply a Solar-Powered Trailer-Mounted Arrow Board to the City of Traverse City

Price quoted shall include title fee, any documentation fee, and all transportation (delivery) charges fully prepaid to the City Garage, 625 Woodmere Ave. Traverse City, MI 49686

MAKE, YEAR, AND MODEL OF EQUIPMENT BID: _____ NATIONAL SIGNAL, INC.

2018 ARO LITE CURVE

COST OF SPECIFIED EQUIPMENT: \$ 6,598⁰⁰

EXPECTED DELIVERY DATE: _____ 21 WORKING DAYS
(Length of time after receipt of purchase order)

Submitted by:

Alan A. Swartzhart
Signature

Municipal & Contractor Supplies
Company Name

ALAN SWARTZHART, OWNER
Name and Title (Print)

P.O. Box 2028
Company Address

(989) 239-1476 - Cell 989-892-8653
Phone Fax

Bay City, MI 48708
City, State, Zip

EMAIL ADDRESS:

Sole proprietorship/partnership/corporation

ALAN.SWARTZHART@GMAIL.COM

If corporation, state of corporation