Incident Management Unit

The State of Tennessee, Department of General Services Vehicle and Asset Management division (VAM) is seeking bids for one (1) Incident Management Unit for the Tennessee Emergency Management Agency (TEMA). This self-contained and fully equipped vehicle shall serve as a portable response unit for the State, providing emergency response services and assistance to all regions of the State.

The Incident Management Unit shall adhere to specified dimensions, feature specified equipment, and comply with safety standards while offering a comfortable and efficient environment. Alternative build methodology will be considered, except for the following items:

- L9 Cummins Engine;
- Allison 6th generation, Model EVS 3000P, electronic torque converting automatic transmission;
- Onan/Cummins 25KW 120/240VAC 60 Hz water-cooled diesel-powered generator;
- Motorola APX8500 Mobile Radio;
- Blue Sea System Model 5032 12 circuit total fuse block;
- HAAS Alert Model HA7 Responder-to-Vehicle collision avoidance system;
- Whelen brand emergency lighting and speaker equipment,
- DesignJet printer; and
- Kussmaul, Model 091-55-20-120 shore inlet

Supporting documentation and justification should be submitted with response to determine whether methodology is equal or greater. The Contractor shall provide regular progress updates on the project to the VAM point of contact listed below. The target time frame for the fully operational vehicle is twelve (12) months or other agreeable time frame to the State. The Contractor shall provide training on the vehicle upon delivery.

A. GENERAL

A1. SINGLE SOURCE MANUFACTURER

a. Bids shall only be accepted from a single source apparatus manufacturer. The manufacturer will integrate, including the chassis, cab weldment, body designed, fabricated and assembled on the bidder's premises.

b. The electrical system (hardwire or multiplex) shall be both designed and integrated by the same apparatus manufacturer.
c. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) must be from a single source manufacturer.

A2. APPROVAL DRAWING

a. Contractor shall provide drawing at time of bid, with approval from the State being required before construction begins.
b. The sales representative shall also have a copy of the same drawing. The finalized and approved drawing shall become part of the award documents.
c. This drawing shall include, at a minimum, the chassis make and model, location of the lights, siren, horns, compartments, and major components.

A3. ELECTRICAL WIRING DIAGRAMS

a. The Contractor shall provide two (2) electrical wiring diagrams, prepared for the model of chassis and body.

A4. CHASSIS

a. The chassis shall be designed and manufactured for heavy duty service, with adequate strength and capacity for the intended load to be sustained and the type of service required.

A5. ENGINE

a. The chassis shall be powered by an electronically controlled engine as described below:

Make:	Cummins
Model:	L9
Power:	450 hp at 2100 rpm
Torque:	1250 lb-ft at 1400 rpm
Governed Speed:	2200 rpm
Emissions Level:	EPA 2024
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	543 cubic inches (8.9L)
Starter:	Delco 39MT™
Fuel Filters:	Spin-on style primary filter with water separator and water-in-fuel sensor. Secondary spin-on style filter.

b. The engine shall include On-board Diagnostics (OBD), which provides self-diagnostic and reporting. The system shall give the owner or repair technician access to state of health information for various vehicle sub systems.
c. The system shall monitor vehicle systems, engine and after treatment. The system shall illuminate a malfunction indicator light on the dash console if a problem is detected.

A6. TRANSMISSION

a. The Contractor shall equip the unit with an Allison 6th generation, Model EVS 3000P, electronic torque converting automatic transmission.
b. The transmission shall be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display shall indicate when service is due.
c. Two (2) Power Take Off (PTO) openings shall be located on both sides of converter housing (positions 4 o'clock and 8 o'clock) as viewed from the rear.
d. A transmission temperature gauge with amber light and audible alarm shall be installed on the cab dashboard.

A7. DELIVERY AND CONTACT

a. Delivery shall be made to Vehicle and Asset Management (VAM), 6500 Centennial Blvd., Nashville, TN 37243 on or before the twelve (12) month time delivery time frame date. The delivery point of contact shall be Scott Shinnaberry at 615-532- 9005 or Scott.Shinnaberry@tn.gov or the appropriate contact as provided by the State.
b. The designated TEMA point of contact for the contractor shall be Andrew Bates at 865-209-5575 or andrew.bates@tn.gov. If the point of contact changes, TEMA shall notify the contractor as soon as possible. The Contractor shall coordinate all communication, progress updates, and inquiries with the respective points of contact as provided.

B. Wheels and Brake Systems

B1. FRONT WHEELS

a. The tires shall be mounted on 22.50" x 12.25" polished aluminum or black disc type wheels with a ten (10) stud, 11.25" bolt circle.

B2. REAR AXLE

a. The Contractor shall equip the unit with an inter-axle differential, which divides torque evenly between axles, on the rear axle with an indicator light mounted on the cab instrument panel.

B3. REAR AIR RIDE SUSPENSION DUMP VALVES

a. The Contractor shall provide a vehicle with the rear air ride with a dump valve system provided by the Contractor.
b. The control shall be located inside the cab.
c. To prevent accidental activation of the valves, a 5 second timed delay shall be built into the control circuit. The chassis back-up alarm shall sound when the control is active.
d. The parking brake must be applied before the control shall be active. Release of the parking brake shall automatically inflate the suspension.

B4. REAR Wheels
a. The tires shall be mounted on 22.50" x 8.25" polished aluminum or black disc wheels with a ten (10) stud 11.25" bolt circle.

B5. TIRE BALANCE
a. All tires shall be balanced with balancing beads. The beads shall be inserted into the tire and eliminate the need for wheel weights.

B6. LUG NUT COVERS
a. Chrome or black lug nut covers shall be supplied on front and rear wheels.

B7. FRONT HUB COVERS
a. The Contractor shall equip the unit with stainless steel or black hub covers with an oil level viewing window.

B8. REAR HUB COVERS
a. The Contractor shall equip the unit with stainless steel or black, high hat, hub covers on the rear axle hubs.

B9. MUD FLAPS
a. The Contractor shall equip the unit with mud flaps behind the front and rear wheels of the apparatus.

B10. WHEEL CHOCKS
a. The Contractor shall provide hone (1) pair of Worden Safety Products, Model HWG-SB, wheel chocks or equivalent.

B11. WHEEL CHOCK BRACKETS

a. The Contractor shall provide one (1) pair of Worden Safety, Model U815T, mounting wheel chock brackets or equivalent with the wheel chock solution above.

B12. ANTI-LOCK BRAKE SYSTEM

a. The unit shall be equipped with an anti-lock braking system (ABS).
b. The ABS shall provide a four (4) channel anti-lock braking control on both the front and rear wheels (rear axle of tandems).
c. A digitally controlled system that utilizes microprocessor technology shall control the anti-lock braking system.
d. The system shall monitor each wheel.

B13. BRAKES

a. The service brake system shall be full air type by Bendix or equivalent.
b. Front brakes shall be disc type with automatic pad wear adjustment.
c. The rear brakes shall be cam operated with automatic slack adjusters.
d. The Contractor shall equip the unit with dust shields.
e. The Contractor shall equip the unit with a Bendix or equivalent dual brake treadle valve.
f. The Contractor shall equip the unit with heated automatic moisture ejector on the air dryer.
g. The Contractor shall equip the unit with two (2) air pressure gauges with a red warning light and an audible alarm, that activate when air pressure falls below 60 psi.
h. The Contractor shall equip the unit with a spring set parking brake system.
i. The Contractor shall equip the unit with a parking brake operated by a push-pull style control valve.
j. The Contractor shall equip the unit with a parking "brake on" indicator light on instrument panel.
k. The Contractor shall equip the unit with a park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, with an automatic spring brake application at 40 psi.
l. The Contractor shall equip the unit with a pressure protection to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa).
m. The Contractor shall equip the unit with quarter turn drain valves on each air tank.
n. The air tank shall be primed and painted to meet a minimum 750-hour salt spray test.
o. The air tanks shall be painted black.

p. To reduce the effects of corrosion, the air tank shall be mounted with stainless steel brackets.

B14. BRAKE SYSTEM AIR DRYER

a. The air dryer shall be WABCO System Saver 1200 with spin-on coalescing filter cartridge and 100-watt heater or equivalent.

B15. BRAKE LINES

a. The Contractor shall equip the unit with color-coded nylon brake. The lines shall be wrapped in a heat protective loom where necessary in the chassis.

B16. AIR INLET

a. The Contractor shall equip the unit with one (1) air inlet with 3D series male coupling. It shall allow air to be supplied to the brake system through a shoreline hose. The inlet shall be located forward in the driver side lower step well of cab.
b. The Contractor shall equip the unit with a check valve to prevent reverse flow of air. The inlet shall discharge into the "wet" tank of the brake system.
c. The Contractor shall provide a mating female fitting with the loose equipment.

B17. AUTOMATIC MOISTURE EJECTOR(S)

a. The Contractor shall equip the unit with five (5) automatic moisture ejectors, Bendix, Model DV-2, installed in the brake system or equivalent.
b. Each moisture ejector shall be equipped with a 12-volt heater, controlled by thermostat and ignition switch.
c. The Contractor shall equip the unit with a moisture ejector on the primary and secondary tank and additional tank reservoirs.

C. Mechanical

C1. COMPRESSION FITTINGS

a. Any nylon tube on the apparatus that is pneumatic shall be plumbed with compression type fittings where applicable. Push lock fittings shall not be acceptable for any pneumatic nylon tube plumbing.

C2. HIGH IDLE

a. The Contractor shall equip the unit with a high idle switch, inside the cab, on the instrument panel, that shall automatically maintain a preset engine rpm. A switch shall be installed at the cab instrument panel for activation/deactivation.
b. The high idle shall be operational only when the parking brake is on and the truck transmission is in neutral.

c. A green indicator light shall be provided, adjacent to the switch and shall illuminate when these conditions are met. The light shall be labeled "OK to Engage High Idle."

C3. ENGINE BRAKE

a. An engine brake shall be installed with the controls located on the instrument panel within easy reach of the driver.
b. The driver shall be able to turn the engine brake system on/off and have a high, medium and low setting.
c. The engine brake shall activate when the system is on and the throttle is released.
d. The engine brake shall be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.
e. The ABS system shall automatically disengage the auxiliary braking device, when required.

C4. FUEL TANK

a. The Contractor shall equip the unit with a minimum 65-gallon fuel tank mounted at the rear of the chassis. The tank shall be constructed of 12-gauge, hot rolled steel. It shall be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank shall be mounted with stainless steel straps.
b. The Contractor shall equip the unit with a 0.75" drain plug in a low point of the tank for drainage.
c. The Contractor shall equip the unit with a fill inlet located on the left-hand side of the body and be covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."
d. The Contractor shall equip the unit with a 0.50" diameter vent running from top of tank to just below fuel fill inlet.
e. The tank shall meet all Federal Highway Administration (FHWA) 393.67 requirements including a fill capacity of 95 percent of tank volume.
f. All fuel lines of the unit shall be those as recommended by the engine manufacturer.

C5. TRANSMISSION COOLER

a. The Contractor shall equip the unit with a transmission oil cooler using engine coolant to control the transmission oil temperature.

C6. STEERING

a. The Contractor shall equip the unit with a heavy-duty power steering. For reduced system temperatures, the power steering shall incorporate an air to oil

cooler hydraulic pump with integral pressure and flow control. All power steering lines shall have wire braided lines with crimped fittings.

b. The Contractor shall equip the unit with a tilt and telescopic steering column to improve fit for a broader range of driver configurations.

D. External

D1. LOGO AND CUSTOMER DESIGNATION ON DASH

a. The dash panel shall have an emblem containing the fire apparatus manufacturer's logo and customer name. The emblem shall have three (3) rows of text for the customer's department name. There shall be a maximum of nine (9) characters in the first row, 11 characters in the second row and 11 characters in the third row.

1. The first row of text shall be: Tennessee
2. The second row of text shall be: Emergency
3. The third row of text shall be: Management

D2. BUMPER

a. The Contractor shall equip the unit with a one (1)-piece, stainless steel or black bumper, minimum of 10.00" high attached to the front of the frame.

b. The Contractor shall equip the unit with a 9.00" channel mounted directly behind the bumper for additional strength.

D3. LIFT AND TOW MOUNTS

a. The Contractor shall equip the unit with lift and tow mounts that are mounted to the frame extension. The Contractor shall equip the unit with lift and tow mounts designed and positioned to adapt to certain tow truck lift systems.

b. The lift and tow mounts with eyes shall be painted the same color as the frame.

D4. TOW HOOKS

a. mounted to the frame extension two (2) chromed steel or black tow hooks installed under the bumper and attached to the front frame members. The tow hooks shall be designed and positioned to allow up to a 6,000 lb straight horizontal pull in line with the centerline of the vehicle. The tow hooks shall not be used for lifting of the apparatus.

D5. FENDER LINERS

a. The Contractor shall equip the unit with full circular, aluminum inner fender liners in the wheel wells.

D6. PANORAMIC WINDSHIELD

a. The Contractor shall equip the unit with a one (1)-piece, safety glass windshield. The windshield shall be full width and provide the occupants with a panoramic view.

D7. ELECTRIC WINDOW CONTROLS

a. Each cab entry door shall be equipped with an electrically operated tempered glass window. A window control panel shall be ergonomically molded into the armrest of the door panel within easy reach of the respective occupant. Each switch shall allow intermittent or auto down operation for ease of use. Auto down operation shall be actuated by holding the window down switch for approximately 1 second. The driver control panel shall contain a control switch for each cab door's window. All other door control panels shall contain a single switch to operate the window within that door.
b. The window switches shall be connected directly to the battery power. This shall allow the windows to be raised and lowered when the battery switch is in the off position.

D8. CAB EXTERIOR

a. The Contractor shall equip the unit with a slip-resistant, knurled aluminum handrail adjacent to each cab door opening to assist during cab ingress and egress.
b. The Contractor shall equip the unit with cab and body entry door security locks.
c. Each cab door and body entry door shall have an electronic digital keypad lock for security.
d. The Contractor shall ensure the vehicle does not include a crawl-through or walk-through from the body to the cab.

D9. STIRRUP STEPS

a. The Contractor shall equip the unit with a stirrup step shall be provided below each front cab door. The steps shall be designed with a grip strut tread material providing support, slip resistance, and drainage. The stirrup step shall be lit by a white 12 volt DC LED light provided on the step.
b. The step light shall be activated automatically when the battery switch is on and the exit doors are opened or by the same means as the body step lights.

D10. STEP LIGHTS

a. The Contractor shall equip the unit with there shall be two (2) white P25 LED step lights with chrome housing. The lights shall be installed at each cab door, one (1) per step, in the driver side front doorstep and passenger side front doorstep.

D11. DEFROST/AIR CONDITIONING SYSTEM

a. The Contractor shall equip the unit with a ceiling mounted combination heater, defroster and air conditioning system installed in the cab above the engine tunnel area.

D12. SUN VISORS

a. The Contractor shall equip the unit with two (2) smoked lexan sun visors. The sun visors shall be located above the windshield with one (1) mounted on each side of the cab.

D13. FRONTAL IMPACT PROTECTION

a. The Safety Restraint System (SRS) system shall provide protection during a frontal or oblique impact event. The system shall activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants.
b. The cab and chassis model shall have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing shall include all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the safety restraint system.
c. The sensor shall activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected.
d. The SRS system shall deploy the following components in the event of a frontal or oblique impact event:
    1. Driver side front air bag
    2. Passenger side knee bolster air bag
    3. Air curtains mounted in the outboard bolster of outboard seat backs
    4. Suspension seats shall be retracted to the lowest travel position
    5. Seat belts shall be pre-tensioned to firmly hold the occupant in place

D14. SIDE ROLL PROTECTION

a. The SRS system shall provide protection during a fast or slow 90 degree roll to the side, in which the vehicle comes to rest on its side.
b. The system shall analyze the vehicle's angle and rate of roll to determine the optimal activation of the advanced occupant restraints.

c. The SRS system shall deploy the following components in the event of a side roll:
    1. Air curtains mounted in the outboard bolster of outboard seat backs
    2. Suspension seats shall be retracted to the lowest travel position
    3. Seat belts shall be pre-tensioned to firmly hold the occupant in place

E. Cabin (Cab)

E1. SEATING CAPACITY

The seating capacity in the cab shall be two (2).

E2. DRIVER SEAT

a. The driver seat design shall be a cam action type with air suspension. For increased convenience, the seat shall include electric controls to adjust the rake (15 degrees), height (1.75" travel) and horizontal (7.00" travel) position. Electric controls shall be located below the forward part of the seat cushion.
b. To provide flexibility for multiple driver configurations, the seat shall have a reclining back, adjustable from 20 degrees back to 45 degrees forward. Providing for maximum comfort, the seat back shall be a high back style with manual lumbar adjustment lever, for lower back support, and shall include minimum 7.50" deep side bolster pads for maximum support.
c. The lumbar adjustment lever shall be easily located at the lower outboard position of the seat cushion.
d. The seat shall include the following features incorporated into the side roll protection system:
    1. Side air curtain shall be mounted integral to the outboard bolster of the seat back. The air curtain shall be covered by a decorative panel when in the stowed position.
    2. A suspension seat safety system shall be included. When activated in the event of a side roll, this system shall pretension the seat belt and retract the seat to its lowest travel position.
e. The seat shall be furnished with a 3-point, shoulder type seat belt.
f. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position.

E3. CAB DOME LIGHTS

a. The Contractor shall equip the unit with two (2) dual LED dome lights with black bezels installed in the cab. The lights shall be mounted above the inside shoulder of the driver and passenger.
b. The color of the LED's shall be red and white.
c. The white LED's shall be controlled by the door switches and the lens switch.

d. The color LED's shall be controlled by the lens switch.
e. In order to ensure exceptional illumination, each white LED dome light shall provide a minimum of 10.1 foot-candles (fc) covering an entire 20.00" x 20.00" square seating position when mounted 40.00" above the seat.

E4. CAB INSTRUMENTATION

a. The cab instrument panel shall consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel.
b. The function of instrument panel controls and switches shall be identified by a label adjacent to each item.
c. Actuation of the headlight switch shall illuminate the labels in low light conditions. Telltale indicator lamps shall not be illuminated unless necessary.
d. The cab instruments and controls shall be conveniently located within the forward cab section directly forward of the driver.
e. Gauge and switch panels shall be designed to be removable for ease of service and low cost of ownership.

E5. GAUGES

a. The gauge panel shall include the following ten (10) ivory gauges with chrome bezels to monitor vehicle performance:
    1. Voltmeter gauge (Volts)
        i. Low volts (11.8 VDC) with amber indicator on gauge assembly with alarm
        ii. High volts (15 VDC) with amber indicator on gauge assembly with alarm
        iii. Very low volts (11.3 VDC) with amber indicator on gauge assembly with alarm
        iv. Very high volts (16 VDC) with amber indicator on gauge assembly with alarm
    2. Tachometer (RPM)
    3. Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)
    4. Fuel level gauge (Empty - Full in fractions)
        i. Low fuel (1/8 full) with amber indicator on gauge assembly with alarm
        ii. Very low fuel (1/32) fuel with amber indicator on gauge assembly with alarm
    5. Engine oil pressure gauge (PSI)
        i. Low oil pressure to activate engine warning lights and alarms with red indicator on gauge assembly with alarm
    6. Front air pressure gauge (PSI)
        i. Low air pressure to activate warning lights and alarm with red indicator on gauge assembly with alarm
    7. Rear air pressure gauge (PSI)

i. Low air pressure to activate warning lights and alarm with red indicator on gauge assembly with alarm

8. Transmission oil temperature gauge (Fahrenheit)
   i. High transmission oil temperature activates warning lights and alarm with amber indicator on gauge assembly with alarm
9. Engine coolant temperature gauge (Fahrenheit)
   i. High engine temperature activates an engine warning light and alarm with red indicator on gauge assembly with alarm
10. Diesel exhaust fluid level gauge (Empty - Full in fractions)
    i. Low fluid (1/8 full) with amber indicator on gauge assembly with alarm

b. All gauges and gauge indicators shall perform prove out at initial power-up to ensure proper performance.

E6. INDICATOR LAMPS

a. To promote safety, the following telltale indicator lamps shall be integral to the gauge assembly and are located above and below the center gauges. The indicator lamps shall be "dead-front" design that is only visible when active. The colored indicator lights shall have descriptive text or symbols.
b. The Contractor shall equip the unit with the following amber telltale lamps:
   1. Low coolant
   2. Trac cntl (traction control) (where applicable)
   3. Check engine
   4. Check trans (check transmission)
   5. Aux brake overheat (Auxiliary brake overheat)
   6. Air rest (air restriction)
   7. Caution (triangle symbol)
   8. Water in fuel
   9. DPF (engine diesel particulate filter regeneration)
   10. Trailer ABS (where applicable)
   11. Wait to start (where applicable)
   12. HET (engine high exhaust temperature) (where applicable)
   13. ABS (antilock brake system)
   14. MIL (engine emissions system malfunction indicator lamp) (where applicable)
   15. SRS (supplemental restraint system) fault (where applicable)
   16. DEF (low diesel exhaust fluid level)
c. The Contractor shall equip the unit with the following red telltale lamps:
   1. Warning (stop sign symbol)
   2. Seat belt
   3. Parking brake
   4. Stop engine
   5. Rack down

d. The Contractor shall equip the unit with the following green telltale lamps:
    1. Left turn
    2. Right turn
    3. Battery on
e. The following blue telltale lamp shall be provided:
    1. High beam

E7. ALARMS

a. Audible steady tone warning alarm: The Contractor shall equip the unit with a steady audible tone alarm whenever a warning message is present.
b. Audible pulsing tone caution alarm: The Contractor shall equip the unit with a pulsing audible tone alarm (chime/chirp) whenever a caution message is present without a warning message being present.
c. Alarm silence: Any active audible alarm shall be able to be silenced by holding the ignition switch at the top position for 3 to 5 seconds. For improved safety, silenced audible alarms shall intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp shall act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition shall enable the steady or pulsing tones respectively.

E8. INDICATOR LAMP AND ALARM PROVE-OUT

a. Telltale indicators and alarms shall perform prove-out at initial power-up to ensure proper performance.

E9. CONTROL SWITCHES

a. For ease of use, the following controls shall be provided immediately adjacent to the cab instrument panel within easy reach of the driver:
    1. Emergency master switch: The Contractor shall equip the unit with a molded plastic push button switch with integral indicator lamp. Pressing the switch shall activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.
    2. Headlight / parking light switch: The Contractor shall equip the unit with a three (3)-position maintained rocker switch.
        i. The first switch position shall deactivate all parking lights and the headlights.
        ii. The second switch position shall activate the parking lights.
        iii. The third switch position shall activate the headlights.
    3. Panel backlighting intensity control switch: The Contractor shall equip the unit with a three (3)-position momentary rocker switch.

i. The first switch position decreases the panel backlighting intensity to a minimum level as the switch is held.
ii. The second switch position is the default position that does not affect the backlighting intensity.
iii. The third switch position increases the panel backlighting intensity to a maximum level as the switch is held.

b. The following standard controls shall be integral to the gauge assembly and are located below the right-hand gauges. All switches have backlit labels for low light applications.
1. High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp shall be provided.
i. The first switch position is the default switch position.
ii. The second switch position shall activate and deactivate the high idle function when pressed and released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch shall indicate when the high idle function is engaged.
2. "Ok To Engage High Idle" indicator lamp: A green indicator light shall be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

c. The Contractor shall equip the unit with the following standard controls placed adjacent to the cab gauge assembly within easy reach of the driver. All switches shall have backlit labels for low light applications.
1. Ignition switch: The Contractor shall equip the unit with a three (3)-position maintained/momentary rocker switch.
i. The first switch position shall deactivate vehicle ignition.
ii. The second switch position shall activate vehicle ignition.
iii. The third momentary position shall disable the Command Zone audible alarm if held for 3 to 5 seconds.
iv. A green indicator lamp shall be activated with vehicle ignition.
2. Engine start switch: The Contractor shall equip the unit with a two (2)-position momentary rocker switch.
i. The first switch position is the default switch position.
ii. The second switch position shall activate the vehicle's engine.
iii. The switch actuator is designed to prevent accidental activation.
3. 4-way hazard switch: The Contractor shall equip the unit with a two (2)-position maintained rocker switch.
i. The first switch position shall deactivate the 4-way hazard switch function.
ii. The second switch position shall activate the 4-way hazard function.
iii. The switch actuator shall be red and includes the international 4-way hazard symbol.

4. Heater, defroster, and air conditioning control panel.
5. Turn signal arm: The Contractor shall equip the unit with a self-canceling turn signal with high beam headlight and windshield wiper/washer controls. The windshield wiper control shall have high, low, and intermittent modes.
6. Parking brake control: The Contractor shall equip the unit with an air actuated push/pull park brake control valve.

E10. CUSTOM SWITCH PANELS

a. The design of cab instrumentation shall allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There shall be positions for up to four (4) switch panels in the overhead console on the driver's side, up to four (4) switch panels to the right of the dash panel facing the driver, up to four (4) switch panels in the overhead console on the passenger side and up to two (2) switch panels to the left of and facing the passenger.
b. All switches shall have backlit labels for low light applications.

E11. DIAGNOSTIC PANEL

a. A diagnostic panel shall be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches shall allow ABS systems to provide blink codes should a problem exist.
b. The diagnostic panel shall include the following:
    1. Engine diagnostic port
    2. Transmission diagnostic port
    3. ABS diagnostic port
    4. SRS diagnostic port (where applicable)
    5. Command Zone USB diagnostic port
    6. ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
    7. Diesel particulate filter regeneration switch (where applicable)
    8. Diesel particulate filter regeneration inhibit switch (where applicable)

E12. CAB LCD DISPLAY

a. A digital four (4)-row by 20-character dot matrix display shall be integral to the gauge panel. The display shall be capable of showing simple graphical images as well as text. The display shall be split into three (3) sections. Each section shall have a dedicated function. The upper left section shall display the outside ambient temperature.

b. The upper right section shall display, along with other configuration specific information:
    1. Odometer
    2. Trip mileage
    3. PTO hours
    4. Fuel consumption
    5. Engine hours
c. The bottom section shall display INFO, CAUTION, and WARNING messages. Text messages shall automatically activate to describe the cause of an audible caution or warning alarm. The LCD shall be capable of displaying multiple text messages should more than one caution or warning condition exist.

E13. "DO NOT MOVE APPARATUS" INDICATOR
a. The Contractor shall equip the unit with a flashing red indicator light, located in the driving compartment, shall be illuminated automatically per the current NFPA requirements. The light shall be labeled "Do Not Move Apparatus If Light Is On."
b. The same circuit that activates the Do Not Move Apparatus indicator shall activate a pulsing alarm when the parking brake is released.

E14. SPARE CIRCUIT
a. There shall be two (2) pairs of wires, including a positive and a negative, installed on the apparatus.
b. The above wires shall have the following features:
    1. The positive wire shall be connected directly to the battery power.
    2. The negative wire shall be connected to ground.
    3. Wires shall be protected to 15 amps at 12 volts DC.
    4. Power and ground shall terminate officer side dash area.
    5. Termination shall be with heat shrinkable butt splicing.
    6. Wires shall be sized to 125 percent of the protection.
c. The circuit(s) may be load managed when the parking brake is set.

E15. SPARE CIRCUIT
a. There shall be one (1) dual USB fast charge socket mounts installed on the apparatus.
b. The above wires shall have the following features:
    1. The positive wire shall be connected directly to the battery power.
    2. The negative wire shall be connected to ground.
    3. Wires shall be protected to 4.8 amps at 12 volts DC.
    4. The USB socket mount shall be near driver.
    5. Termination shall be a dual USB charger socket.
    6. Wires shall be sized to 125 percent of the protection.

c. This circuit(s) may be load managed when the parking brake is applied.

E16. SPARE CIRCUIT

a. There shall be one (1) Blue Sea System, Model 5032 12 circuit total fuse block, split into two (2), 6 circuits sections with negative bus bar. The fuse block shall include a cover with circuit labels.
b. The wires for the fuse block shall have the following features:
c. The positive wire to control the first 6 circuits shall be protected to 10 amps and connected directly to the battery power.
d. The positive wire to control the second 6 circuits shall be protected to 10 amps and connected directly to the battery switched power.
e. The negative wire shall be connected to ground.
f. Power, ground and fuse block(s) shall terminate behind officer seat.
g. Wires shall be sized to 125 percent of the protection.
h. This circuit(s) may be load managed when the parking brake is set.

E17. COLLISION MITIGATION

a. The Contractor shall equip the unit with a HAAS Alert®, Model HA7 Responder-to-Vehicle (R2V) collision avoidance system on the apparatus. The HA7 cellular transponder module shall be installed behind the cab windshield, as high and near to the center as practical, to allow clear visibility to the sky.
b. The transponder shall be connected to the vehicle's emergency master circuit and battery direct power and ground.
c. While responding with emergency lights on, the HA7 transponder sends alert messages via cellular network to motorists in the vicinity of the responding truck that are equipped with the WAZE app.
d. While on scene with emergency lights on, the HA7 transponder sends road hazard alerts to motorists in the vicinity of the truck that are equipped with the WAZE app.
e. The HA7 Responder-to-Vehicle (R2V) collision avoidance system shall include the transponder and a 5 year cellular plan subscription with the full plan cost included in the initial purchase.

E18. VEHICLE DATA RECORDER

a. The Contractor shall equip the unit with a vehicle data recorder (VDR) capable of reading and storing vehicle information.
b. The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A USB cable can be used to connect the VDR to a laptop to retrieve required information. The

program to download the information from the VDR will be available to download on-line.

c. The vehicle data recorder shall be capable of recording the following data via hardwired and/or CAN inputs:
    1. Vehicle Speed - MPH
    2. Acceleration - MPH/sec
    3. Deceleration - MPH/sec
    4. Engine Speed - RPM
    5. Engine Throttle Position - % of Full Throttle
    6. ABS Event - On/Off
    7. Seat Occupied Status - Yes/No by Position
    8. Seat Belt Buckled Status - Yes/No by Position
    9. Master Optical Warning Device Switch - On/Off
    10. Internal clock syncs the time and date when a laptop is connected
d. The system shall also be capable of silencing the seat belt monitoring system alarm as part of the silence alarm switch. The alarm to chirp in intervals to remind the operator that an alarm is still sounding.
e. An additional input shall be included with this system. When the VDR is active, this input shall record when the light tower is raised.

E19. SEAT BELT MONITORING SYSTEM

a. The Contractor shall equip the unit with a seat belt monitoring system (SBMS) on the color display. The SBMS shall be capable of monitoring up to six (6) seating positions indicating the status of each seat position per the following:
    1. Seat Occupied & Buckled = Green LED indicator illuminated
    2. Seat Occupied & Unbuckled = Red LED indicator with audible alarm
    3. No Occupant & Buckled = Red LED indicator with audible alarm
    4. No Occupant & Unbuckled = No indicator and no alarm
b. The seat belt monitoring screen shall become active on the color display when:
    1. The home screen is active:
        i. and there is any occupant seated but not buckled or any belt buckled with an occupant.
        ii. and there are no other Do Not Move Apparatus conditions present. As soon as all Do Not Move Apparatus conditions are cleared, the SBMS shall be activated.
c. The SBMS shall include an audible alarm that shall warn that an unbuckled occupant condition exists, and the parking brake is released, or the transmission is not in park.

E20. RADIO ANTENNA MOUNT

a. The Contractor shall equip the unit with two (2) standard 1.125", 18 thread antenna-mounting base(s) installed one (1) on the left side and one (1) on the right side on the cab roof with high efficiency, low loss, coaxial cable(s) routed to the instrument panel area. A weatherproof cap shall be installed on the mount.

E21. VEHICLE CAMERA SYSTEM

a. The Contractor shall equip the unit with a color vehicle camera system provided with the following:
    1. One (1) camera located at the rear of the apparatus, pointing rearward, displayed automatically with the vehicle in reverse.
    2. One (1) camera located on the right side of the apparatus, pointing rearward, displayed automatically with the right side turn signal.
    3. One (1) camera located on the left side of the apparatus, pointing rearward, displayed automatically with the left side turn signal.
b. The camera images shall be displayed on the left side vehicle information center display. Audio from the microphone on the rear camera shall be emitted by an amplified speaker with volume control located behind the driver seat.
c. The Contractor shall equip the unit with the following components:
    1. One (1) rear camera or equivalent
    2. Two (2) side cameras or equivalent
    3. All necessary cables TCU module with WiFi
    4. An in-cab module shall provide WiFi wireless interface and data logging capability. The WiFi interface shall comply with IEEE 802.11 b/g/n capabilities while communicating at 2.4 Gigahertz. The module shall communicate through a white WiFi antenna allowing a line of site communication range of up to 300 feet with a roof mounted antenna.
    5. The module shall transmit a password protected web page to a WiFi enabled device (i.e. most smart phones, tablets or laptops) allowing two levels of user interaction. The user level shall allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level shall allow diagnostic access to inputs and outputs installed on the control and information system.
    6. The TCU capability shall record faults from the engine, transmission, and ABS control and information systems as they occur. No other data shall be recorded at the time the fault occurs. The data TCU shall provide up to 2 Gigabytes of data storage.
    7. The TCU shall provide a means to download the TCU information and update software in the device.

E22. DEDICATED RADIO EQUIPMENT CONNECTION POINTS

a. The Contractor shall equip the unit with three (3) studs in the primary power distribution center located in front of the officer for two-way radio equipment. The studs shall consist of the following:
    1. 12-volt 40-amp battery switched power
    2. 12-volt 60-amp ignition switched power
    3. 12-volt 60-amp direct battery power
b. The Contractor shall equip the unit with a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

F. Electrical Systems, Lighting, and Audio Equipment

F1. ELECTRICAL SYSTEMS

a. All 12-volt electrical equipment installed by the apparatus manufacturer shall conform to modern automotive practices. All wiring shall be high temperature crosslink type. Wiring shall be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers shall be provided which conform to SAE Standards. Wiring shall be color, function and number coded. Function and number codes shall be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors shall be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.
b. Electrical wiring and equipment shall be installed utilizing the following guidelines:
    1. All holes made in the roof shall be caulked with silicon, rope caulk is not acceptable. Large fender washers, liberally caulked, shall be used when fastening equipment to the underside of the cab roof.
    2. Any electrical component that is installed in an exposed area shall be mounted in a manner that shall not allow moisture to accumulate in it. Exposed area shall be defined as any location outside of the cab or body.
    3. Electrical components designed to be removed for maintenance shall be fastened with metal screws. A coil of wire shall be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.
    4. Corrosion preventative compound shall be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections shall require this compound in the plug to prevent corrosion and for easy separation (of the plug).
c. All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area.
d. All electrical terminals in exposed areas shall have silicon applied completely over the metal portion of the terminal.

e. All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, shall be furnished. Rear identification lights shall be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads shall be protected from damage by installing a false bulkhead inside the rear compartments.
f. An operational test shall be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.
g. The results of the tests shall be recorded and provided to the State at the time of delivery.

F2. MASTER BATTERY SWITCH

a. The Contractor shall equip the unit with a master battery switch within the cab within easy reach of the driver to activate the battery system.
b. The Contractor shall equip the unit with an indicator light on the instrument panel to notify the driver of the status of the battery system.

F3. BATTERY CHARGER

a. The Contractor shall equip the unit with a 45 amp battery charger.
b. The battery charger shall be wired to the AC shoreline inlet through an AC receptacle adjacent to this battery charger.
c. The battery charger shall be located in the cab behind the driver seat.

F4. AUTO EJECT FOR SHORELINE

a. The Contractor shall equip the unit with one (1) Kussmaul, Model 091-55-20-120 , 20 amp 120 volt AC shoreline inlet(s) to operate the dedicated 120 volt AC circuits on the apparatus.
b. The shoreline inlet(s) shall include gray weatherproof flip up cover(s).
c. There shall be a release solenoid wired to the vehicle's starter to eject the AC connector when the engine is starting.
d. The shoreline(s) shall be connected to the battery charger.
e. There shall be a mating connector body supplied with the loose equipment.
f. There shall be a label installed near the inlet(s) that state the following:
    1. Line voltage
    2. Current rating (amps)
    3. Phase
    4. Frequency
    5. The shoreline receptacle shall be located on the driver side front bulkhead of body.

F5. AIR HORN SYSTEM

a. Two (2) Hadley, eTone or equivalent, chrome air horns shall be recessed in the front bumper. The air horn system shall be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve shall be installed to prevent the loss of air in the brake system.
b. The air horns shall be located on the left side of the bumper, outside of the frame rail.

F6. ELECTRONIC SIREN

a. A Whelen, Model 295SLSA1 or equivalent, electronic siren with noise canceling microphone shall be provided.
b. This siren to be active when the battery switch is on and the emergency master switch is on.
c. Electronic siren head shall be recessed in the driver side center switch panel.
d. The electronic siren shall be controlled on the siren head only. No horn button or foot switches shall be required.

F7. SPEAKER

a. The Contractor shall equip the unit with one (1) Whelen, Model SA315P or equivalent, black nylon composite, 100-watt, speaker with through bumper mounting brackets and polished stainless steel or black grille. The speaker shall be connected to the siren amplifier.
b. The speaker(s) shall be recessed in the center of the front bumper.

F8. AUXILIARY SIREN

a. There shall be a Federal, Model EQ2B-200 or equivalent, electronic siren with noise canceling microphone provided.
b. The amplifier shall be installed behind the passenger seat.
c. This siren shall be controlled by the siren head and by the following:
    1. a foot switch located on the passenger's side
    2. a foot switch located on the driver's side

F9. AUXILIARY SIREN SPEAKER

a. There shall be a Federal Signal Model BP200-EF or equivalent 200 watt recess mount speaker furnished.

F10. AUXILIARY SPEAKER LOCATION

a. The auxiliary electric siren speaker shall be installed in the face of the front bumper on the right side in the outside position.

F11. CUSTOM MULTIPLEX ELECTRICAL SYSTEM

a. The Contractor shall equip the unit with custom multiplex system for AC and DC circuits.
b. The system shall include the following features:
    1. Remote activation, control, and status of all AC and DC circuit breakers
    2. Enhanced DC circuit breaker functionality including no-load indication, dimming and current usage.
    3. Extensive monitoring capabilities, including tank levels, battery status, engine and generator status, AC source status, and user defined alarms, etc.
    4. Fully configurable displays "Configurable displays allow for control and monitoring of the System throughout the vehicle. Simplified vehicle wiring.
    5. AC power distribution box (8 position) hydraulic-magnetic circuit breakers are used for the main breakers as well as the 8 branch circuits. Solenoids are employed to allow remote control of all breakers through the network. All breakers can be operated manually in addition to network control.
    6. DC power distribution box (8 position) electronic circuit breakers
    7. System monitor (Sensor Interface Unit, SIU) The system monitor is used to place alarm, monitoring, and discrete input data on the network. Interfaces with up to 34 DC signals. This data is available to control functions and can also be used to display status on the touch screen displays.
    8. Touch Screen Display. The screen provides a touch interface for monitoring and controlling critical systems from anywhere on the vehicle.
c. Octoplex option or comparable for temperature monitoring up to 4: (Temperatures of rooms, equipment rack and outside displayed through Octoplex Touch Screen)
d. The Contractor shall equip the unit with a remote monitoring feature.

F12. 12 VDC LOW VOLTAGE WIRING

a. All DC wires shall be heat resistant type that meets SAE J1128 type SXL and/or multi-conductor, tinned copper conductors, PVC insulation cable (multi-conductors are used only for control and instrumentation inside the modular body) The wires shall be loomed and routed the maximum distance away from possible high heat sources and properly clamped to body or frame members to preclude chaffing on other components.
b. Where holes are cut in the body structure for wiring, the holes shall have the whole circumference grounded and filed smooth and rubber grommets shall be installed. The wires shall be labeled every 3" with number and function and of a gauge that is rated to carry 125 percent of the maximum current for which the circuit is projected. All wires and cables shall be marked at each end with a function number that is documented in the DC schematic and described in the wire list.

c. Battery cables shall be sized to match the OEM cables with crimped terminals and a black shrink tubing protecting the negative terminals and red for the positive terminals.

F13. POWER CONVERTER/CHARGER

a. One 120VAC to 12VDC Progressive Dynamic or equivalent marine grade 80-amp power converter shall be provided to support the 12VDC electrical load and charge the batteries during generator or shore power operations.

F14. 120/240 VAC HIGH VOLTAGE WIRING

a. Wire sizes shall be determined per circuit requirements and in accordance with the National Electrical Code. All 120/240VAC wiring shall be routed through cable raceways. Fixed wiring systems that are not in raceway shall be routed in flexible conduit rated at not less than 194 degrees Fahrenheit.
b. Type SO cord with a rating at least 600 volts are use on equipment plugged into receptacles. All wires shall be type THHN, THW or Type SO cord. Electrical cords or conduits will be supported within 6 inches of any junction box and at a minimum of every 24 inches of continuous run. All wiring shall be secured and fastened at all bends and shall be protected against chaffing and damage. Wiring shall be concealed but easily accessible.
c. All circuits shall be properly grounded in accordance with the National Electrical Code NEC-250-6. All wires and cables will be mark at each end with a function number that is documented in the AC schematic and described in the wire list.
d. All wiring and associated equipment shall be tested by the manufacturer and quality assurance personnel. Electrical polarity verification shall be made on all permanently mounted equipment and receptacles.

F15. POWER DISTRIBUTION PANEL

a. The power distribution panel shall consist of a custom designed anodized black aluminum panel with white laser etched descriptions for every breaker and switch.
b. The panel shall be equipped with 120/240-volt, 50 amps, single-phase, three-wire system that has appropriately sized circuit breakers.
c. An Analog Frequency/Amps/Voltmeter shall be located on the main power distribution panel. Features shall include frequency display 55 to 65Hz, Ammeter displays 0 to 100amps, AC Voltmeter display 0 to 150vac with a selector switch between phases. A surge suppression device that meets the requirements of ANSI and IEEE shall be installed per phase located in the power distribution enclosure. Other appropriately sized circuit breakers shall be installed for 12 VDC applications.

d. A manual power transfer switch shall be installed in the electrical distribution panel for selection of either generator power or shore power. The transfer switch shall switch both hot legs and the neutral keeping all power sources isolated.
e. The panel shall also contain DC meters for monitoring voltage and generator hours. A generator remote start/stop switch and Line Alive indicators for shore power, generator and trickle service will be provided.
f. The panel is hinged to provide easy service entrance for maintenance.
g. Liebert GXT5 UPS or equivalent - 3000VA/2700W 120V, Online Double Conversion Rack Tower, Energy Star, Uninterruptible Power Supply, Sine Wave Battery Backup or equivalent with surge protection shall be installed in the equipment rack. Built in surge protection shall be included. The Uninterruptible Power Supply (UPS) shall be online at all times. The equipment shall be rack mounted using 2 rack units. Approximate back up time shall be 10-20 minutes depending on type of load.

F16. EXTERNAL SHORE POWER INPUT CONNECTOR(S)

a. An external power inlet, Hubbell or equivalent 100A 125/250V, 3 pole 4 wire Twist-Lock shall be installed on the street side of the modular body. The shore power inlet shall have a self-closing cover so that the interior is shielded from the elements when not in use. is the mechanism shall be watertight when the cover is securely fastened. This connector shall be used to provide the required 240-volt, 100 amp, single-phase, three-wire AC service to the power distribution panel.
b. A recessed aluminum waterfall enclosure shall be installed in the body for the shore power connector. This enclosure shall provide protection for the shore power connector and shall be angled downward to allow water to run off.
c. 100amp 120/240vac shore power cable shall be included with features of 50ft, and pin and sleeve connectors.

F17. TRICKLE CHARGE SERVICE PLUG

a. The unit shall include a 30-amp night service/aux input to charge batteries and outlets. The input shall be Kussmaul - Super Auto Eject or equivalent 30 Amp, 120V - 091-159-30-120 model.
b. 30 amp, 120V, shore power cable, 25', L5-30 connectors

F18. 120 VAC OUTLETS

a. One (1) 120VAC/USB duplex outlet shall be installed in the raceway at each of the workstations.
b. A minimum of six (6) additional interior duplex 120VAC/USB outlets included, location shall be determined at the preconstruction meeting.

c. Two (2) 120VAC GFCI duplex outlets with weatherproof covers shall be installed on the exterior curbside; each exterior duplex shall be on separate circuits.

F19. 12 VDC LIGHTING (INTERIOR)

a. 12-volt ceiling mounted I2 white dimmable light fixtures with switches shall be installed in the interior areas.
b. Interior lighting upgrade from white to red/ white LED lighting shall be installed in ceiling and under upper cabinets. Dimmable switching feature and the ability to select between red or white lighting shall be included.
c. These lights shall be individually switched in zones or at the electrical the power distribution panel.

F20. 12 VDC LIGHTING (EXTERIOR)

a. Six (6) Whelen M9 or equivalent series LED exterior scene lights shall be installed on the exterior of the vehicle, with two (2) curbside, two (2) street side and two (2) on the rear.
b. The two on the rear will also serve as back up lights that shall be able to be activated along with the standard reverse lights when the transmission is placed in the reverse gear.
c. The scene lights shall be two-way switched from the electrical control panel or cab dash.
d. Each exterior compartment shall have a 12VDC LED lighting.
e. Amdor or equivalent LED underbody ground/perimeter lighting activated by switch or opening of vehicle or body entrance doors shall be included on the unit. Lighting shall include two (2) on the cab doors and two (2) on each of the rear bumpers.
f. 2 Whelen PCPSM1C Pioneer Plus or equivalent, 12v DC single lighthead, combination flood/spotlight surface mount housing, chrome plated shall be installed on the unit. Exact location to be determined in preconstruction meeting.
g. 4 Whelen Pioneer Plus or equivalent, 12v DC dual light head, combination flood/spot light surface mount housing, chrome plated shall be installed on the unit. Exact Location to be determined in preconstruction meeting.
h. Unit shall have a blue LED lighted grab handle at entry door.
i. Unit shall have green LED flashing beacon mounted on roof or mast top.

F21. REAR LIGHTING

a. Rear lighting shall include:
    1. Two (2) Whelen®, Model M6BTT or equivalent, red LED stop/taillights
    2. Two (2) Whelen, Model M6T or equivalent, amber LED arrow turn lights
    3. Two (2) Whelen Model M6BUW or equivalent, LED backup lights

4. The lights will be mounted in polished combination housing.
5. Two (2) Whelen, Model M6FCV3P or equivalent, three (3) place chromed ABS housings provided for the rear M6 series stop/tail, directional, and back up lights.
6. The marker and clearance lights will be Truck-Lite or equivalent, LED light fixtures.
7. Truck-Lite NYK-77 or equivalent anti-corrosive will be applied to lamp-plug interfaces.
8. One Whelen PELCC or equivalent perimeter enhancement (porch) LED light, chrome flange.

F22. EMERGENCY LIGHTING – BODY

a. Emergency lighting on the body shall include:
   1. 1 Roto-Ray 4000W (red/red/white) clear outer lens or equivalent
   2. 8 Whelen M6 series Super-LED Steady burn with clear outer lens split color or equivalent
   3. 8 Whelen M9 series Super-LED Steady burn with clear outer lens split color or equivalent
   4. Emergency Lighting - Cab Roof
   5. 1 Whelen 72" Freedom IV lightbar or equivalent (red/white), full front warning, front corner and back corner. No takedown or alley lighting needed.

F23. ROOF TOP LIGHTING

a. Roof top lighting shall include
   1. Whelen / Will Burt NS2.3-500 WB Night Scan or equivalent 4x125 watt X200 LED 12VDC, NFPA wired handheld remote control with e-stop button and 50ft control cable, 50ft power cable

F24. GENERATOR

a. The unit shall include an Onan/Cummins 25KW 120/240VAC 60 Hz water-cooled diesel-powered generator mounted on rubber isolators.
b. The generator and muffler shall be mounted as required to suppress sound and vibration. Brand specific to assist with service availability.
c. The generator shall be equipped with sensors that will activate the generator shut down system on low oil pressure and high-water temperature.
d. The generator shall be equipped with engine block heater if available from the generator manufacturer as an OEM feature.
e. The generator shall include a remote Start/Stop preheat switch and hour meter located in the modular body power distribution panel.
f. Fuel supply for the generator shall be from the chassis fuel tank.

g. The system shall be designed and installed to leave a minimum of 10 percent of fuel in the tank when the generator runs out of fuel.
h. Power panel shall have an auxiliary fuel gauge that operates when generator is running to monitor fuel level
i. Power panel shall have a Dynagen or equivalent digital generator function display installed. Display shall show battery voltage, water temp., oil pressure, faults, hours, and include a remote generator start.
j. The generator shall be equipped with a 12VDC alternator that will be wired to charge the modular body battery as well as satisfy all 12VDC systems of the generator.

F25. HVAC

a. Four (4) air conditioners shall be roof-mounted units rated at 15,000 BTU each with heating capability.
b. An HVAC ducting system shall be installed to provide consistent cooling throughout the vehicle.
c. The ducting system shall be insulated and integrated into the ceiling structure. 2" X 8" aluminum tubing shall be used for supply ducting to create a common supply. The system shall deliver conditioned air from any unit that is running to any supply vent in the vehicle. In case of failure this allows the remaining units to keep the whole truck supplied with conditioned air. The return ceiling grilles will be located astride of the supply ducts.
d. The air conditioners shall be equipped with condensation pumps to drain condensation through drain tubes integrated into the structure of the body, eliminating water run-off onto the roof and sides of the Incident Management Unit.
e. Two (2) 110V wall-mounted heaters rated at 5000 BTU each shall be installed in the interior of the body.

G. Safety and Compliance

G1. PARTS MANUAL

a. The Contractor shall provide one (1) custom parts manual(s) in USB flash drive format for the complete Incident Management Unit.
b. The manual(s) shall contain the following:
    1. Job number;
    2. Part numbers with full descriptions;
    3. Table of contents;
    4. Parts section sorted in functional groups reflecting a major system, component, or assembly;
    5. Parts section sorted in alphabetical order;
    6. Instructions on how to locate parts.

c. Each manual shall be specifically written for the chassis and body model being purchased. It shall not be a generic manual for a multitude of different chassis and bodies.

G2. CHASSIS SERVICE MANUALS

a. The Contractor shall provide one (1) chassis service manuals on USB flash drives containing parts and service information on major components with the completed unit.
b. The manual shall contain the following sections:
    1. Job number
    2. Table of contents
    3. Troubleshooting
    4. Front axle/suspension
    5. Brakes
    6. Engine
    7. Tires
    8. Wheels
    9. Cab
    10. Electrical, DC
    11. Air systems
    12. Appendix
c. The manual shall be specifically written for the chassis model being purchased. It shall not be a generic manual for a multitude of different chassis and bodies.

G3. CHASSIS OPERATION MANUAL

a. The Contractor shall provide a chassis operation manual on one (1) USB flash drive.

G4. ONE (1) YEAR MATERIAL AND WORKMANSHIP

a. The Contractor shall provide a minimum one (1) year basic apparatus material and workmanship limited warranty. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service.
b. The Contract shall submit a copy of the warranty certificate with the bid.

G5. THREE (3) YEAR MATERIAL AND WORKMANSHIP

a. The Contractor shall provide the new chassis with a three (3) year material and workmanship limited warranty. The warranty shall cover such portions of the chassis built by the manufacturer as being free from structural failures caused by defects in material and workmanship that would arise under normal use and service.

b. The Contractor shall submit a copy of the warranty certificate with the bid.

H. Body

H1. BODY

a. The Contractor shall ensure the overall shelter portion of the body is a minimum of 33 feet in length ~~of the body is~~ while bumper-to-bumper length does not exceed 45 feet long.

b. The Modular custom body shall be completely designed and manufactured in-house and shall be an all-aluminum body manufactured utilizing aluminum alloys capable of carrying the maximum payload allowed by the chassis.

c. All framing and structural supports shall be welded in accordance with the current standards as set forth in the American Welding Society Code.

d. The body shall have a seamless finish with no exposed fasteners.

e. The body shall be attached to the chassis with hardened steel "U" bolts fastened to the chassis and body mounting rails. A neoprene-mounting cushion will be installed between the modular body and the chassis frame. The body will be designed and constructed to insure a life expectancy of more than ten years with normal use.

f. The body shall include the following features:

1. Welded 3/16 aluminum 5052-H32 alloy wheel wells with mud flaps

g. All body trim pieces, hinges, and handles shall be stainless steel or other non-corrosive material

h. All exterior fasteners such as machine screws, bolts and sheet metal screws shall be stainless steel.

H2. RUB RAIL

a. Bottom edge of the side wall shall be trimmed with a bright aluminum extruded rub rail.

b. The rub rails shall not be an integral part of the body construction, which allows replacement in the event of damage.

H3. SLIDE OUT SECTIONS

a. The unit shall have custom sized slide-out, 178" in width and 30" extension depth, with a raised floor area.

b. The construction, insulation and trim of the slide out room shall be identical to the body for a functional and visual match.

c. A pneumatic operated slide system shall be used to extend and retract the slide-out section.

d. Slide out sections shall be operated with switching placed at an interior location and/or via an umbilical corded control from an exterior compartment.
e. Two (2) amber flashing lights shall be installed including one in each end of slide-out. Lights shall be controlled by switch.
f. The unit shall have ten (10) custom sliding, swivel, pedestal mounted seat base installed in slide-out

H4. STORAGE COMPARTMENTS

a. All compartments shall have weather strip gaskets around the full perimeter of the doors, and non-skid material installed on the sills.
b. All compartments shall include locking two stage rotary latches with stainless steel paddle-type handles and dual "Nader Pins" for secure closure. All compartments will have automatic DC LED lighting.
c. All compartments shall include heavy duty gas shock closers, one installed per door.

H5. EXTERIOR DISPLAY COMPARTMENT

a. The unit shall contain exterior display compartment for external mounted 55" display.
b. The unit shall contain custom fabricated aluminum frame and door. Painted to match body. Includes two gas shocks, lockable latch, and LED compartment lighting with switch.
c. Raceway and wiring for power/video/audio to display and 120V duplex outlet shall be included. The unit shall have an I/O panel installed in raceway.

I. Interior

I1. CONFERENCE AREA

a. The conference area shall be located in the front of the body. Area shall consist of a conference table with seating. Chairs shall be provided for the conference table. Chairs shall be secured with eyehooks and bungee cords while the vehicle is in transit.
b. The conference table shall be supported by an aluminum trough and legs to provide cable routing paths. Space for recessed equipment points in tabletops shall also be added to this section.

I2. WORKSTATION AREA

a. The unit shall contain storage cabinets and workstations. Overhead storage cabinets shall be installed above the base cabinets. Chairs shall be provided for the front area workstations. Chairs shall be secured with eyehooks and bungee cords while vehicle is in transit.

I3. COMMUNICATIONS WIRING RACEWAYS

a. A typical cable raceway shall be installed above consoles and in the upper corners of the walls and roof, from the equipment racks throughout the Incident Management Unit to provide for communication cabling to the workstations, conference table or other locations as needed. The raceway covers shall be removeable to provide easy access to the wiring. Wiring installed in the raceway will be neatly bundled and secured.

J. Communications and Display Equipment

J1. VIDEO EQUIPMENT

a. The unit shall include the following additional tech equipment:
   1. Video switching
   2. Extron Fixed Switcher: DXP 1616 HD 4K Plus, 16 x 16 HDMI Matrix Switcher or equivalent
   3. Qty 4 MKP 2000 - remote control panel or equivalent
   4. TLP Pro 1025M, 10" wall mount touch panel, 1280x800 or equivalent
   5. RM 6 - rack mount kit for TLP Pro 1025M or equivalent
   6. Control Processor with
      i. IPCP Pro 255Q xi,
      ii. Quad core,
      iii. 2GB RAM,
      iv. 2 serial,
      v. 4 I/O,
      vi. 1 IR or equivalent
   7. Link License Upgrade
   8. Programming Upgrade, per touch panel or unique device added
   9. Video equipment including
   10. AppleTV 4K (32GB) high dynamic range (Dolby Vision and HDR10) with Dolby Digital Plus 7.1 surround sound or equivalent. Siri remote with voice search or equivalent shall also be included.
   11. ShareLink Pro 500 with Miracast, Airplay or equivalent:
   12. WebShare or equivalent to share content via a web browser
   13. Up to 4 sources simultaneously shown on screen

J2. SATELLITE TV EQUIPMENT

a. The unit shall include the following satellite TV equipment:
   1. TRAV'LER DirecTV Pro Model or equivalent
   2. Qty 2 DirecTV HD receiver, RF capable or equivalent
   3. Off-Air TV equipment
   4. Multi-function digital ATSC tuner with built-in HDMI and analog output or equivalent

5. 2 RU clamping rack mount shelf
6. Off-Air antenna, omnidirectional dome, roof-mount
7. Off-Air antenna, mounting platform

b. AUDIO EQUIPMENT
   1. Wireless vocal rack mount system with SM58 handheld microphone or equivalent model
   2. Voltage-Controlled Amplifier
   3. 24 VDC switching power supply, North American AC plug, 500 mA, DC plug
   4. Remote level control, black (interior/exterior compartment)
   5. 120W RMS P.A. mixer amplifier (or equivalent model)
   6. MicroPlus 4.5" 2-Way 25W 70V/100V ceiling speaker (pair, white) or equivalent
   7. 3x1 Passive Stereo Signal/Speaker Selector, Line-Level Balanced 1/4" TRS or equivalent
   8. A minimum of two (2) exterior 100 watt speaker, nylon composite, black (or equivalent model)
   9. Outdoor rated IP45 soundbar, 70W 2.1 outdoor soundbar with built-in subwoofer - black, RCA / 3.5mm / optical, 39.4" x 3.5" x 3.5" or equivalent

J3. DISPLAYS

a. The unit shall include the following displays:
   1. Qty 20 34" Ultrawide LCD Monitor with,
      i. 2-Way PBP screen split,
      ii. HDMI DP ports,
      iii. VESA (or equivalent)
   2. 65" Class 8000 Series LED 4K UHD Smart TV (or equivalent)
   3. Touch screens / conference displays
   4. Virtual Technologies 65” touchscreen display or equivalent model with,
      i. P-Cap 40 point touch, 3840x2160 resolution,
      ii. 400 nits,
      iii. Anti-glare tempered glass,
      iv. Android 11.0,
      v. Multiple video inputs & video output,
      vi. Fully functional USB-A and USB-C ports,
      vii. The display shall be able to be upgraded with a webcam or a built-in Windows 11 PC,
   5. VTI i7 OPS Mini Computer or equivalent model for VT13 displays
   6. Pro Windows 11 Pro License Key for VT OPS PC
   7. VTI-CAM 13 M Camera 93 degree wide field of view, 8 array mic with face track or equivalent

J4. ROUTING AND SWITCHING EQUIPMENT

a. The unit shall include the following routing and switching equipment:

1. 52-Port JetStream (or equivalent or updated model) with
   i. PoE+ switch,
   ii. 48 x Gigabit PoE+ Ports (30W),
   iii. 4 x Shared gigabit SFP slots,
   iv. L2/L3/L4 QoS and IGMP snooping,
   v. IPv6,
   vi. VLAN,
   vii. QoS,
   viii. Multicast support,
   ix. IPv6,
   x. Local & Omada SDN Cloud Management,
   xi. 104Gbps Switching Capacity,
   xii. 384W POE Budget
2. Qty 2 Patch Panel, RJ-45, CAT6, 1X24

J5. CELLULAR NETWORK EQUIPMENT

a. The unit shall include the following cellular network equipment:

1. E3000 Series Enterprise Router 5GB, NetCloud 1 year subscription (or equivalent or updated model) with subscription cost included in initial purchase.
2. Synergy 9-in-1 5G MIMO Antenna (or equivalent or updated model).
   i. 4x 5G (600MHz-6GHz),
   ii. 1x 5G (1.7-6GHz),
   iii. 3x WIFI, 1x GPS.

J6. COMPUTER EQUIPMENT

The Contractor shall include the following State-supplied computer equipment in the Unit:

1. Ten (10) mounting points and installation for the ten (10) ~~CFE~~ Customer Supplied Workstation computers.
2. DesignJet 36-in plotter/printer, includes Tie Downs for Transit, or equivalent updated model
3. HP LaserJet Pro MFP M428fdw All-in-One Printer, Print/Copy/Scan/Fax, Wi-Fi, Rack-Mountable: 16.5" x 15.4", or equivalent or updated model

J7. NETWORK PTZ CAMERA EQUIPMENT

a. The Contractor shall include the following network PTZ camera equipment in the Unit:

1. Viper PTZ High-Definition IP H.265 or equivalent Mast Camera with 30x Optical Zoom Lens with Image Stabilization, De-Fogging feature, Wide Dynamic Range
2. Interface Cable, 3 Ft (Mast Integration)
3. Sidewinder Desktop Controller includes wall block terminal junction box, patch cable and power supply.
4. HD IP Camera decoder, ONVIF/RTSP, H.265, H.264, Alarm I/O Support, or equivalent model
5. 90W POE++ Injector (or equivalent)
6. 4" x 4" x 2" Nonmetallic Junction Box

J8. NETWORK SECURITY CAMERA EQUIPMENT -

a. The Contractor shall equip the unit with the following:
   1. One (1) 8CH IP 1U Rackmount NVR with
      i. 2HDD,
      ii. IP Resolution up to 8MP/30FPS (128MBPS),
      iii. Smart H.265+/H.265/Smart H.264+/H.264,
      iv. 8 port embedded POE switch,
      v. 4TB storage.
   2. A minimum of six (6) 4MP IP Indoor/Outdoor small size vandal domes with
      i. Fixed 2.8MM Lens (104° FOV),
      ii. 98 Feet Smart IR,
      iii. POE capable. (or equivalent model)
   3. Equipment shall be NDAA Compliant

J9. RADIO EQUIPMENT

a. The Contractor shall equip the unit with the following Motorola equipment:
   1. Cab Radio Equipment including:
      i. One (1) High-Tier Mobile Radio Provision
   2. Radio specifications including:
      i. APX8500 Mid power mobile
      ii. AES/DES-XL/DES-OFB ENCRYP APX and ADP
      iii. Speaker 15W water resistant
      iv. VHF, UHF & 800Mhz antennas with multiplexer to cab radio.
      v. ASTRO Digital CAI Operation or equivalent with
      vi. No GPS Antenna needed APX,
      vii. Remote mount E5 Mid power,
      viii. APX Control head software or equivalent,
      ix. Conventional operation APX8500 or equivalent,
      x. DVRS MSU Activation or equivalent,
      xi. APX E5 Control head or equivalent,

xii. Standard DTMF palm microphone APX or equivalent,
xiii. ENH: 3 Year Essential service,

3. NMO base (with cable and connector), Cab or equivalent

J10. MOBILE RADIO EQUIPMENT

a. The unit shall include space on the antenna pedestal for a minimum of 6 high-tier mobile radio provisions
b. The unit shall include (5) mobile radios with the features below:
    1. APX8500 all band MP mobile
    2. Group services
    3. AES/DES-XL/DES-OFB ENCRYP APX and ADP
    4. Wi-Fi/GNSS Stubby antenna LMR240
    5. Over-the-Air provisioning
    6. TDMA Operation
    7. All band mobile antenna (7/8/V/U)
    8. SMARTZONE or equivalent
    9. Standard warranty - no essential
    10. Auxillary speaker 13W (3.2OHM)
    11. Remote mount cable 50-ft. APX or equivalent
    12. APX Control head software or equivalent
    13. Remote mount E5 MP
    14. ASTRO Digital CAI OP APX or equivalent
    15. APX E5 Control head or equivalent
    16. Standard DTMF palm microphone APX or equivalent
    17. Multikey operation
    18. P25 Trunking software APX or equivalent
    19. A licesnse for IMW Presence (per user)
    20. A license for IMW Group management
    21. A license for Trunked radio user
c. The unit shall include at minimum ten (10) NMO bases (with cable and connector) on the body.
d. The unit shall include a minimum of seven (7) magnetic palm microphone hangup holders for mobile radios

J11. CLOCKS AND TIMING EQUIPMENT OR EQUIVALENT

a. The unit shall include a minimum of two (2) four-digit four-inch clock with user changeable color LEDs, power over ethernet, black polycarbonate case, control buttons on top capable of simultaneously displaying two different time zones.

J12. Winegard STARLINK Satellite System or equivalent

a. Starlink Flat High Performance Kit (includes antenna, router/mount, power supply/ mount and cables) or equivalent
b. Starlink Wedge Mount Kit or equivalent

J13. ADDITIONAL SYSTEMS EQUIPMENT

a. The unit shall include the following additional equipment:

1. Nycoil, 1.25" DIA. for 42' mast with standard cables or equivalent
2. Qty 2 Logitech M185 wireless mouse or equivalent
3. Qty 10 wireless mouse/keyboard set or equivalent
4. Rack shelf, universal, 1RU
5. Qty 2 2RU clamping rack mount shelf
6. Brush grommet panel 1RU or equivalent
7. 3RU drawer anodized black or equivalent
8. Anodized aluminum with laser etched characters custom exterior I/O panel with connectors
9. Thirteen (13) anodized aluminum with laser etched characters custom workstation I/O panels with connectors
10. Anodized aluminum with laser etched characters custom recessed box I/O panel with connectors (conference table)
11. Large conference I/O box with retractable lid, black, or equivalent
12. Rack-mounted anodized aluminum with laser etched characters custom DC distribution panel with fabricated rack enclosure, with up to forty-eight (48) labeled fuse positions, requires manufacturer fabricated panel cover