



STATE OF LOUISIANA

Competitive Contract

Vendor: 310009207
Company
ECONOLITE CONTROL PRODUCTS INC
3360 E LA PALMA AVE
ANAHEIM CA 92806-2856
Phone : 714-630-3700
Fax : 714-630-7123

T Number:
Version: 2
LAPS Contract: No
Fiscal Year: 2016
Min.Ord.Value: 0.00
Distributor Contract: No
PCard:No
Co-op Agreement:Yes

Contract number: 4400007690
Description: DOTD Contract-Econolite Video Detection

Buyer Information

Name: JULIE KENNISON
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SEBD Vendor: No
SEHI Vendor: No
VSE Vendor: No
DVSE Vendor: No
Contract Valid Dates:
09/25/2015 - 09/24/2017

Ship To Address

DOTD ENG&OPTRAFF ENG&SVC/SEC45
7686 TOM DR
BATON ROUGE, LA 70806

Supplier Text: This Econolite Video Detection Equipment Maintenance Contract is hereby renewed for a twelve (12) month period, beginning September 25, 2016 through September 24, 2017, per the attached TCS 43 specification, Revised 8/11/2015. Original contract period was September 25, 2015 through September 24, 2016

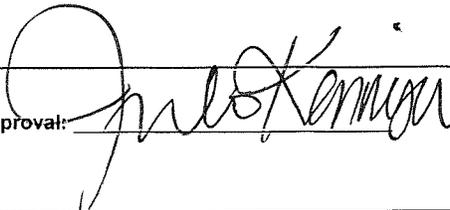
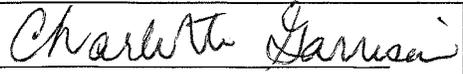
NOTE: This has been approved as a proprietary purchase. No substitute acceptable.

At the option of the Department of Transportation and Development and acceptance by the contractor, this contract may be extended for one (1) additional twelve (12) month period at the same prices, terms and conditions. Contract not to exceed thirty-six (36) months.

Prior to exercising the Department's option to extend the contract, the Department will determine if an extension is in the best interest of the Department, taking into consideration current market trends, cost factors, price comparison with similar service in other States and various other factors as determined by the DOTD Procurement Director.

The Department of Transportation and Development reserves the right to cancel this contract with thirty (30) days written notice.

The quantities listed below are estimated usage only. No quantities are guaranteed. Only actual quantities needed will be ordered by DOTD. In the event a greater or lesser quantity is needed, the right is reserved by DOTD to increase or decrease the amount at the unit price stated in the bid.

Recommending Approval:  Approved by: 

Contract number: 4400007690 T Number:	Vendor: 310009207 Distributor Contract: NO	Page 2 of 4
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Estimated Annual Quantities:

- Line 1: 2
- Line 2: 2
- Line 3: 1
- Line 4: 6
- Line 5: 2
- Line 6: 6
- Line 7: 10
- Line 8: 7

Products are subject to laboratory testing before final acceptance.

DELIVERY ARO: 30-45 Days

DELIVERY INSTRUCTIONS:

Deliveries accepted Monday through Friday, 7:00 AM - 3:30 PM except for holidays, weekends, or times of disaster.

Please call (225) 935-0231 or (225) 935-0179 at least twenty-four (24) hours prior to delivery.

Notice to Vendor:

Line	Material No. ----- Supplier Part No.	Description	Prod. Cat.	UOM	Net Price	Discount
1	11016 Econolite / AMBKTM11	BRACKET,CAMERA,HORIZONTAL MOUNTING VEHICULAR VIDEO DETECTION EQUIPMENT, ECONOLITE NO. AMBKTM11, TCS NO. 43, REV. 8/11/2015	46161500	EA	55.00000	
2	11017 Econolite / AMBKTM12	BRACKET,CAMERA,VERTICAL MOUNTING VEHICULAR VIDEO DETECTION EQUIPMENT, ECONOLITE NO.AMBKTM12, TCS NO. 43, REV. 8/11/2015	46161500	EA	95.00000	
3	11026 Econolite / 1175-0011	CABLE,CAMERA,3-WIRE,1000 FT LENGTH VEHICULAR VIDEO DETECTION EQUIPMENT, ECONOLITE NO. 1175-0011, TCS NO. 43, REV. 8/11/2015	46161500	ROL	600.00000	
4	11032 Econolite / ATAPE	DETECTOR,PORT MASTER,FOR SOLO TERRA VEHICULAR VIDEO DETECTION EQUIPMENT,	46161500	EA	1,850.00000	

Line	Material No. ----- Supplier Part No.	Description	Prod. Cat.	UOM	Net Price	Discount
		ECONOLITE NO. ATAPE, TCS NO. 43, REV 8/11/2015				
5	11034 Econolite / ASTCBL10 & 33550G5	HARNES,INPUT/OUTPUT FOR SOLO TERRA,TS2 VEHICULAR VIDEO DETECTION EQUIPMENT, ECONOLITE NO. ASTCBL10 AND ECONOLITE NO. 33550G5, TCS NO. 43, REV 8/11/2015	46161500	EA	61.00000	
6	11036 Econolite / ATIP1	PANEL,COMM INTERFACE,F/SOLO TERRA FOR SOLO TERRA, VEHICULAR VIDEO DETECTION EQUIPMENT, ECONOLITE NO. ATIP1, TCS NO. 43, REV 8/11/2015	46161500	EA	695.00000	
7	50910 Econolite/AS EASYLOCK (P/N 1095-030)	CONNECTOR, EASYLOCK USED FOR TERMINATING THE CABLE CONNECTION TO THE AUTOSCOPE SOLO TERRA AND AUTOSCOPE ENCORE MVP'S, TCS NO. 43, REV. 08/11/2015, ECONOLITE MODEL NO. ASEASYLOCK (P/N 1095-030)	46161500	EA	25.00000	
8	50911 Econolite / AENCOREH	CAMERA, VISION PROCESSOR, W/MPEG4 ENCODER AND ETHERNET, VEHICULAR VIDEO DETECTION EQUIPMENT, TCS NO. 43, REV. 08/11/2015, ENCONOLITE NO. AENCOREH	46161500	EA	3,650.00000	

Contract number: 4400007690 T Number:	Vendor: 310009207 Distributor Contract: NO	Page 4 of 4
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Standard Terms and Conditions

1. THIS IS NOT AN ORDER TO SHIP (OR BEGIN SERVICE). A CONTRACT RELEASE OR PURCHASE ORDER MUST BE ISSUED BEFORE YOU ARE AUTHORIZED TO SHIP (OR BEGIN SERVICE).
2. THIS IS NOTICE THAT THE CONTRACT REFERENCED ABOVE HAS BEEN AWARDED TO YOU BASED ON THE BID (OR PROPOSAL) SUBMITTED. ALL TERMS, CONDITIONS, AND SPECIFICATIONS OF THE SOLICITATION WILL APPLY TO ALL ORDERS.
3. ANY AGENCY AUTHORIZED TO PURCHASE FROM THIS CONTRACT MUST ISSUE AN ORDER AND REFERENCE THE CONTRACT NUMBER, LINE NUMBER AND COMMODITY ITEM NUMBER FOR EACH ITEM.
4. CHANGES IN ITEMS TO BE FURNISHED ARE NOT PERMITTED (UNLESS APPROVED BY THE ISSUING AGENCY PRIOR TO DELIVERY). PRIOR APPROVAL MUST ALSO BE OBTAINED BEFORE DISTRIBUTORS CAN BE ADDED OR DELETED.
5. IF A DISTRIBUTOR LIST WAS SUBMITTED, CONTRACTOR MUST SEND COPIES OF THIS AWARD TO EACH DISTRIBUTOR.
6. QUANTITIES LISTED ARE ESTIMATED AND NO QUANTITIES ARE GUARANTEED (UNLESS "COMMITTED VOLUME" IS SPECIFICALLY STATED). CONTRACTOR MUST SUPPLY ACTUAL REQUIREMENTS ORDERED AT THE CONTRACT PRICE AWARDED.
7. COMPLIANCE WITH CIVIL RIGHTS LAWS.

THE CONTRACTOR AGREES TO ABIDE BY THE REQUIREMENTS OF THE FOLLOWING AS APPLICABLE: TITLE IV AND TITLE VII OF THE CIVIL RIGHTS ACT OF 1964, AS AMENDED BY THE EQUAL OPPORTUNITY ACT OF 1972, FEDERAL EXECUTIVE ORDER 11246, THE FEDERAL REHABILITATION ACT OF 1973, AS AMENDED, THE VIETNAM ERA VETERAN'S READJUSTMENT ASSISTANCE ACT OF 1974, TITLE IX OF THE EDUCATION AMENDMENTS OF 1972, THE AGE ACT OF 1975, AND CONTRACTOR AGREES TO ABIDE BY THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT OF 1990. CONTRACTOR AGREES TO NOT TO DISCRIMINATE IN ITS EMPLOYMENT PRACTICES, AND WILL RENDER SERVICES UNDER THIS AGREEMENT AND ANY CONTRACT ENTERED INTO AS A RESULT OF THIS AGREEMENT, WITHOUT REGARD TO RACE, COLOR, RELIGION, SEX, NATIONAL ORIGIN, VETERAN STATUS, POLITICAL AFFILIATION, OR DISABILITIES. ANY ACT OF DISCRIMINATION COMMITTED BY CONTRACTOR OR FAILURE TO COMPLY WITH THESE STATUTORY OBLIGATIONS WHEN APPLICABLE SHALL BE GROUNDS FOR TERMINATION OF THIS AGREEMENT AND ANY CONTRACT ENTERED INTO AS A RESULT OF THIS AGREEMENT.

Louisiana
Department of Transportation
And
Development

Traffic Control Standard
Number 43



8/11/2015

Revised August 11, 2015

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
SPECIAL SPECIFICATIONS
VIDEO DETECTION

Machine Vision Processor (MVP) W/ Software Compression: (SAP# 11027, Stock# 14-07-0080)

General:

This specification sets the minimum requirements for a wide-area vehicle detection system that processes video images for vehicle presence, count, speed, and other typical traffic parameters. The detection of vehicles passing through the field of view of an image sensor shall be available to a large variety of end user applications as simple contact closure outputs, data for a traffic controller, and other traffic data. This reflects the current real time detector or alarm states (on/off) or as summary traffic statistics that are reported locally or remotely. The contact closure outputs shall be provided to a traffic signal controller and comply to the NEMA (National Electrical Manufacturers Association) type C or D detector rack or a Type 170 input file rack standards.

The system architecture shall fully support networking of system components through a variety of industry standard and commercially available infrastructure that are used in the traffic industry. The serial data communications shall support direct connect, modem, and multi-drop interconnects. Simple twisted pair wiring shall be supported to minimize overall system cost, improve reliability, utilizing existing infrastructure and ease of system installation and maintenance. 5 ½ twisted pair cable to be used from MVP to traffic control cabinet. No coaxial cable will be accepted or used. Both video communications and serial data communications shall optionally be interconnected over long distances through repeat and daisy chain configurations. A single serial data communications multi-drop link on twisted pair shall extend up to 2 miles and include up to 24 units on a drop before the signal(s) must be repeated.

On the software application side of the network, the system shall be integrated through a client-server relationship. A communications server application shall provide the data communications interface between as few as one to as many as hundreds of machine vision processor (MVP) sensors and a number of client applications. The client applications shall either be hosted on the same PC as the communications server or may be distributed over a local area network of PC's using the industry standard TCP/IP network protocol. Multiple client applications shall execute simultaneously on the same host or multiple hosts, depending on the network configuration.

System Hardware:

The MVP image sensor shall be an integrated imaging color CCD array with optics, high-speed, image processing hardware and a general purpose CPU bundled into a sealed enclosure. The CCD array shall be directly controlled by the general purpose CPU, thus providing high video quality for detection that has virtually no noise to degrade

detection performance. It shall be possible for the user to zoom the lens (up to 16x), as required for operation. It shall provide software JPEG video compression and an optional video compression co-processor so as not to interfere with detection performance while streaming video. The MVP shall provide direct real-time iris and shutter speed control. The MVP image sensor shall be equipped with an integrated color auto zoom/auto focus lens that can be changed using computer software. The integrated camera/processor shall also have a unique IP address.

The MVP sensor shall output full motion color video through the means of a differential video port in NTSC format. The differential video is transmitted over a single twisted pair of the 5 ½ twisted pair connected to the MVP.

Real-time detector performance shall be observed by viewing the video output from the sensor with overlaid flashing color detectors to indicate the current detection state (on/off). Real-time speeds and classifications shall also be visible through streaming video via the video player and from full motion video.

The MVP shall also have the option of being attached to a pan/tilt driver that allows the user to pan, tilt and zoom the camera from within the same software package for video detection. The driver shall be able to come back to the original detection position within 0.2 degrees after panning and tilting.

The MVP sensor shall operate on 24 VAC, 50/60Hz at a maximum of 20 watts. The camera and processor electronics shall consume a maximum of 10 watts and the remaining 15 watts shall support an enclosure heater.

Video Outputs:

The MVP shall provide color video output from the interface panel for real-time NTSC or PAL display on a monitor or PC over standard coax cable.

The software shall also display streaming video as part of the user software based on JPEG software video compression. The streaming video shall be recordable as a data file on the PC for later playback and editing. Streaming video from multiple MVPs shall be simultaneously displayable as a group or video wall. Streaming video shall be possible at communication speeds from 9.6 kBaud to 230 kBaud.

System Software:

The MVP sensor's embedded firmware shall automatically perform a variety of diagnostic, installation, fault tolerant, and vehicle detection operations. Vehicle detection shall be reliable, consistent, and perform under all weather, lighting and traffic congestion conditions.

A software suite of client applications shall reside on the host client / server PC. The software suite shall support Microsoft Windows 98, ME, XP, NT, 2000 and later operating systems. Client applications shall include:

- Network Browser: Learn a network of connected modular cabinet interface units and MVPs then show the topology in a logical hierarchical relationship.
- Detector Editor: Create and modify detector configurations to be executed on the MVP sensor.
- Operation Log: Extract the MVP run-time operation log of special events that have occurred.
- Software Installer: Reconfigure one or more MVP sensors with a newer release of embedded system software.
- Video Player: Play streaming color video from any or all sensors connected to network. Video player shall also have the ability to go in to a video wall option which will divide the PC screen in as many sensors that are opened giving the user optimal viewing. The video player shall also be able to record and play back any or all sensors being viewed.
- Video Controller: Control the zoom, pan & tilt (optional) of the sensor it is controlling. Multiple sensors shall be able to be viewed or controlled at the same time. If multiple sensors are being viewed simultaneously, the video controller application shall allow the user to enlarge the screen in to a video wall option, which will split up the whole screen with the number of sensors being viewed.

An optional software developer's kit shall facilitate creation of custom client applications.

Detection Types:

The MVP shall be able to be programmed with a variety of detector types that perform specific functions. All functions listed below shall be accessible from MVP and software and no additional modules, software or hardware will be required. The general functions performed by the detectors shall:

- Include presence/passage detection of moving and stopped vehicles.
- Enable detection based on the direction of travel or based on when a moving vehicle stops.
- Measuring vehicle speed and length and provide five (5) classes of vehicles based on length.
- Determine counts, either lane by lane or cumulative.

Speed alarm detectors:

- Output alarm on each fast vehicle, ignoring vehicles of length of less than the user defines.
- Output alarm based on the average number of vehicles the user enters and the upper and lower speed thresholds that the user defines.
- Output alarm based on the average speed over a user defined time frame.
- Output alarm based on a user defined percent increase or decrease over a speed limit.

Traffic Data Collection:

The MVP sensor shall optionally store cumulative traffic statistics, internally in non-volatile memory, for later retrieval and analysis. Traffic data shall be accessible from MVP and software and will not use any additional modules (software or hardware). MVP sensor shall have at least 5.5 megabytes of memory for data storage. The following data types are available to be stored in time increments from a cycle to one-hour increments:

- Average Flow Rate
- Total Volume Count
- Arithmetic Mean Speed
- Vehicle Class Count
- Average Time Headway
- Average Time Occupancy
- Level of Service
- Space Mean Speed
- Space Density
- Density

The above data types shall also be available to be viewed real-time.

Machine Vision Processor (MVP) W/ Ethernet and MPEG4 Encoder: (SAP# 50911)

General:

This specification sets forth the minimum requirements for a system that monitors vehicles on a roadway via processing of video images. The detection of vehicles passing through the field-of-view of an image sensor shall be made available to a large variety of end user applications as simple contact closure outputs that reflect the current real-time detector or alarm states (on/off) or as summary traffic statistics that are reported locally or remotely. The contact closure outputs shall be provided to a traffic signal controller and comply with the National Electrical Manufacturers Association (NEMA) type C or D detector rack or 170 input file rack standards.

The system architecture shall fully support Ethernet networking of system components through a variety of industry standard and commercially available infrastructures that are used in the traffic industry. The data communications shall support direct connect, [modem,] and multi-drop interconnects. Simple, standard Ethernet wiring shall be supported to minimize overall system cost and improve reliability, utilizing existing infrastructure and ease of system installation and maintenance. Both streaming video and data communications shall optionally be interconnected over long distances through fiber optic, microwave, or other commonly used digital communications transport configurations.

On the software application side of the network, the system shall be integrated through a client-server relationship. A communications server application shall provide the data communications interface between as few as one to as many as hundreds of Machine Vision Processor (MVP) sensors and a number of client applications. The client applications shall either be hosted on the same PC as the communications server or may be distributed over a local area network of PC's using the industry standard TCP/IP network protocol. Multiple client applications shall execute simultaneously on the same host or multiple hosts, depending on the network configuration. Additionally, a web-browser interface shall allow use of industry standard Internet web browsers to connect to MVP sensors for setup, maintenance, and playing digital streaming video.

System Hardware:

The machine vision system hardware shall consist of three components: 1) a color, 10x zoom, MVP sensor 2) a modular cabinet interface unit 3) a communication interface panel. Additionally, an optional personal computer (PC) shall host the server and client applications that are used to program and monitor the system components. The real-time performance shall be observed by viewing the video output from the sensor with overlaid flashing detectors to indicate the current detection state (on/off). The MVP sensor shall optionally store cumulative traffic statistics internally in non-volatile memory for later retrieval and analysis.

The MVP shall communicate to the modular cabinet interface unit via the communications interface panel and the software applications using the industry standard TCP/IP network protocol. The MVP shall have a built-in, Ethernet-ready, Internet Protocol (IP) address and shall be addressable with no plug in devices or

converters required. The MVP shall provide standard MPEG-4 streaming digital video. Achievable frame rates shall vary from 5 to 30 frames/sec as a function of video quality and available bandwidth.

The modular cabinet interface unit shall communicate directly with up to eight (8) MVP sensors and shall comply with the form factor and electrical characteristics to plug directly into a NEMA type C or D detector rack providing up to thirty-two (32) inputs and sixty-four (64) outputs or a 170 input file rack providing up to sixteen (16) contact closure inputs and twenty-four (24) contact closure outputs to a traffic signal controller.

The communication interface panel shall provide four (4) sets of three (3) electrical terminations for three-wire power cables for up to eight (8) MVP sensors that may be mounted on a pole or mast arm with a traffic signal cabinet or junction box. The communication interface panel shall provide high-energy transient protection to electrically protect the modular cabinet interface unit and connected MVP sensors. The communications interface panel shall provide single-point Ethernet connectivity via RJ45 connector for communication to and between the modular cabinet interface module and the MVP sensors.

System Software:

The MVP sensor embedded software shall incorporate multiple applications that perform a variety of diagnostic, installation, fault tolerant operations, data communications, digital video streaming, and vehicle detection processing. The detection shall be reliable, consistent, and perform under all weather, lighting, and traffic congestion levels. An embedded web server shall permit standard internet browsers to connect and perform basic configuration, maintenance, and video streaming services.

- There shall be a suite of client applications that reside on the host client / server PC. The applications shall execute under Microsoft Windows XP or Vista. Available client applications shall include:
- Master network browser: Learn a network of connected modular cabinet interface units and MVP sensors, display basic information, and launch applications software to perform operations within that system of sensors.
- Configuration setup: Create and modify detector configurations to be executed on the MVP sensor and the modular cabinet interface unit.
- Operation log: Retrieve, display, and save field hardware run-time operation logs of special events that have occurred.
- Software install: Reconfigure one or more MVP sensors with a newer release of embedded system software.
- Streaming video player: Play and record streaming video with flashing detector overlay.
- Data retrieval: Fetch once or poll for traffic data and alarms and store on PC storage media.
- Communications server: Provide fault-tolerant, real-time TCP/IP communications to / from all devices and client applications with full logging capability for systems integration.

Functional Capabilities:

MVP Sensor:

The MVP sensor shall be an integrated imaging color CCD array with zoom lens optics, high-speed, dual-core image processing hardware bundled into a sealed enclosure. The CCD array shall be directly controlled by the dual-core processor, thus providing high-quality video for detection that has virtually no noise to degrade detection performance. It shall be possible to zoom the lens as required for setup and operation. It shall provide JPEG video compression as well as standard MPEG-4 digital streaming video with flashing detector overlay. The MVP shall provide direct real-time iris and shutter speed control. The MVP image sensor shall be equipped with an integrated 22x zoom lens that can be changed using either configuration computer software. The digital streaming video output and all data communications shall be transmitted over the three-wire power cable.

Power:

The MVP sensor shall operate on 110/220 VAC, 50/60Hz at a maximum of 25 watts. The camera and processor electronics shall consume a maximum of 10 watts and the remaining 15 watts shall support an enclosure heater.

Detection Zone Programming:

Placement of detection zones shall be by means of a PC with a Windows XP or Vista operating system, a keyboard, and a mouse. The PC monitor shall be able to show the detection zones superimposed on images of traffic scenes.

The detection zones shall be created by using a mouse to draw detection zones on the PC monitor. Using the mouse and keyboard it shall be possible to place, size, and orient detection zones to provide optimal road coverage for vehicle detection. It shall be possible to download detector configurations from the PC to the MVP sensor and cabinet interface module, to retrieve the detector configuration that is currently running in the MVP sensor, and to back up detector configurations by saving them to the PC fixed disks or other removable storage media.

The supervisor computer's mouse and keyboard shall be used to edit previously defined detector configurations to permit adjustment of the detection zone size and placement, to add detectors for additional traffic applications, or to reprogram the MVP sensor for different traffic applications or changes in installation site geometry or traffic rerouting.

Detection Types

The MVP shall be able to be programmed with a variety of detector types that perform specific functions. Detector types shall include the following:

- Count Detector--outputs traffic volume statistics;
- Presence Detector--indicates presence of a vehicle, stopped vehicle, or vehicles traveling the wrong direction;
- Speed Detector--provides vehicle speed, length, classification, volume, density and traffic flow statistics;
- Detector Function--combines outputs of multiple detector types via Boolean logic functions and allows timing extensions and delays. Similar to the Contrast Detector below, it monitors video signal quality globally in the scene.
- Station--accumulates traffic data over user specified time intervals, including cycle splits for intersection applications;
- Input Label Detector--provides states of a user-provided input signal;
- Speed Alarm--generates an alarm output based on user-defined speed and volume thresholds;
- Contrast Detector--monitors video signal quality and provides an optical fail safe alarm feature. Unlike the global measure of video quality in the Detector Function above, this Contrast Detector can monitor specific areas of the scene.
- Incident Detector--operates an incident detection algorithm which monitors speed and occupancy data from individual traffic lanes to detect the shock

- wave effects which propagate upstream from a capacity-reducing incident that occurs outside the camera field of view. It is adjustable for regularly recurring congestion.
- Scheduler--controls detector operation based upon a user-defined time schedule;
 - Label--displays system or user-defined static or dynamic information on the output video of the MVP, including titles and bitmap graphics.
 - Lane Detector-- generates an alarm for stopped vehicle (default setting), a slow vehicle, or a wrong-way vehicle along an entire outdoor traffic lane within the field of view.
 - Tunnel Detector--generates an alarm for stopped vehicle (default setting), a slow vehicle, or a wrong-way vehicle along an entire tunnel lane within the field of view.
 - The speed detector shall report vehicle speed and vehicle classification based on five user- defined length categories, satisfying the four generalized category requirement recommended by FHWA.
 - Multiple detector outputs can be combined together via OR, AND, NAND, and N of M
 - logical functions. In addition, the MVP shall be able to condition the detector outputs based on the state of associated input signals. The following detector output types shall be available:
 - a) Type 0 -- send a call for every vehicle presence detected;
 - b) Type 1 -- extends a call on Green, delays a call on NOT Green;
 - c) Type 2 -- both Extends and Delays a call on Green, no change to call on NOT Green;
 - d) Type 3 -- provides Stop Bar detection;
 - e) Type 4 -- provides Stop Bar detection with a timer;
 - f) Type 5 -- provides Stop Bar detection with a reset timer;
 - g) Type 6 -- enables a call when the input phase is Red;
 - h) Type 8 -- provides Dilemma Zone detection, based on the speed of the vehicle;
 - i) Type 9 -- provides moving vehicle detection and time validation during Red;
 - j) Type 10 -- arbitrates between individual Contrast Loss detectors to determine video quality loss.
- Each MVP shall be able to detect the absence of a valid video signal on each image sensor input. Upon detecting the absence of a valid video signal, the MVP shall place all the detector outputs associated with the failed image sensor input into a fail-safe ON state known as recall.
 - Each MVP shall be able to detect when the quality of the video input from the image sensor is not sufficient to enable vehicle detection (e.g., when environmental conditions obscure the sensor view). Use of this video loss

detection capability shall be selectable by the user. If a video loss failure is detected, the MVP shall place the detector outputs associated with the failed sensor on minimum recall, maximum recall, or fixed time recall as selected by the user.

Interval Traffic Data:

Each MVP shall count vehicles in real-time and compute the average of traffic parameters over user-defined time intervals (or time slices), as follows:

- Volume -- number of vehicles detected during the time interval;
- Occupancy -- detector occupancy measured in percent of time;
- Vehicle Classification -- number of vehicles in each of five classes, as defined by vehicle length in feet or meters;
- Flow Rate -- vehicles per hour per lane;
- Headway -- average time interval between vehicles;
- Speed -- time mean and space mean vehicle speed in km/hr or mi/hr;
- Level of Service -- determined by user-defined thresholds for average speed or capacity flow rates;
- Space Occupancy -- sum of the vehicle lengths divided by average distance traveled during the time interval measured as percent;
- Density -- flow rate divided by space mean speed expressed in vehicles/km or vehicles/mi.

The duration of the time intervals (or time slices) shall be user-customizable as per signal control cycle or 10, 20, or 30 seconds, or 1, 5, 10, 15, 30, or 60 minutes, or any other arbitrary time interval of choice.

It shall be possible to poll the MVP for traffic flow, vehicle presence, or event alarm data during normal operation when connected to a computer with serial communications.

Furthermore, an option to minimize data loss, called persistent polling, shall be provided to collect time interval data when the MVP is not connected to a computer. It shall operate as follows: When the communication link to the traffic management computer is cutoff temporarily, for whatever reason, the MVP shall write the persistent poll data to non-volatile EEPROM flash memory. At such time as the link is restored, the persistent poll data shall be transferred to the traffic management computer. Thus though delayed, there is no loss of data due to communications link failures. This shall also allow the use of dial-up modem applications to be scheduled, for example daily or weekly calls, to collect all data since last connection was made.

Finally, the option for persistent polling shall begin accumulating and storing defined poll data to flash memory if needed after system reboot, as may be caused by local mains power failures.

Using the persistent polling technique above, it shall be possible to save the time-interval data in non-volatile EEPROM flash memory within the MVP for later transfer to the supervisor computer for analysis.

Retrieval of real-time poll data or persistent poll data stored in the memory of the MVP shall be via a serial communications port or integrated Ethernet port using manufacturer provided software tools. Provision shall be made for transfer of data via a modem and dial-up telephone lines, via private cable, fiber optic network, wireless system, Ethernet or via direct connection to another computer by serial cable.

Each MVP shall provide an optional power line monitor to ensure the accuracy of its internal clock.

Traffic Data Collection & Web Posting (Optional)

The MVP sensor shall store cumulative traffic statistics, internally in non-volatile memory, for later retrieval and analysis. MVP sensor shall have at least 5 megabytes of memory for data storage. Data collection shall not require additional modules or extra software.

The above data types shall also be available to be viewed real-time through a standard web browser via a data collection and management service (DCMS). This DCMS shall have the capability of polling any and all video detector sensors via a number of communication interfaces, including and not limited to PSTN, CDPD, CDMA, dedicated twisted-pair, fiber, and wireless and displaying the data real-time on a custom website provided by the manufacturer. In addition to displaying real-time data and color snapshots of the image sensor, the manufacturer shall archive all data for the agency to create custom data reports in Excel or HTML by simply accessing the website and filtering the dates and reporting parameters. All hardware necessary to archive the data shall be owned and maintained by the manufacturer with the agency only needing a web browser to view and operate the DCMS.

The DCMS shall provide system configuration updates, reporting tools, software updates, system backups, and technical support, at no additional cost, throughout the 2-year term of the service relationship.

The DCMS Server shall be able to generate the following detail:

- o Report Manager Graphic User Interface (GUI) to customize data distribution and reporting
- o Custom, automated Reports, Alarms, FTP, and email services
 - Web statistics reporting – account management logs
 - Microsoft® Excel®, SQL, XML, Jscript database technology

Optimal Detection

The video detection system shall optimally detect vehicle passage and presence when the MVP sensor is mounted 30 feet (10 m) or higher above the roadway, when the

image sensor is adjacent to the desired coverage area, and when the distance to the farthest detection zone locations are not greater than ten (10) times the mounting height of the MVP. The recommended deployment geometry for optimal detection also requires that there be an unobstructed view of each traveled lane where detection is required. Although optimal detection may be obtained when the MVP is mounted directly above the traveled lanes, the MVP shall not be required to be directly over the roadway. The MVP shall be able to view either approaching or receding traffic or both in the same field of view. The preferred MVP sensor orientation shall be to view approaching traffic since there are more high contrast features on vehicles as viewed from the front rather than the rear. The MVP sensor placed at a mounting height that minimizes vehicle image occlusion shall be able to simultaneously monitor a maximum of six (6) traffic lanes when mounted at the road-side or up to eight (8) traffic lanes when mounted in the center with four lanes on each side.

Detector Port Master Stand Alone Enclosure & Power Supply:
(SAP# 11029, Stock# 14-07-0091)

The stand alone enclosure will power a single Detector Port Master, TS1 or TS2 when the Detector Port Master can not be powered up from an existing detector rack.

Detector Port Master including connecting cable (TS1): (SAP# 11030, Stock# 14-07-0100)

The detector port master provides a simple, reliable interface between multiple machine vision processors (MVPs) and any standard traffic controller or device. It monitors phase colors and gathers detection information from up to 8 MVPs.

The detector port master is a single card device that can stand-alone or slide easily into a detector rack. Its advanced microcontroller-based communication circuitry passes real-time detection states or alarms as discrete detector outputs to a traffic controller or other control system. The MVP configures the input and outputs on the detector port master automatically.

The detector port master is suitable for detection systems in all TS1, type 170 and 2070 cabinets. The real-time detector outputs from the rear edge connectors or front connector are fully compatible with existing loop detector systems.

The simple design using a single circuit board and faceplate allows easy insertion into a 4-channel slot of a standard detector rack or equivalent enclosure.

Visual indications show the operational status and health of the detector port master and the networked MVPs connected at the communication interface panel. The modular cabinet interface unit shall provide 8 phase inputs and 16 detector outputs.

Detector Port Master including connecting cable (TS2): (SAP# 11031, Stock# 14-07-0110)

The detector port master provides a simple, reliable interface between multiple machine vision processors (MVPs) and any standard traffic controller or device. It monitors phase colors and gathers detection information from up to 8 MVPs.

The detector port master is a single card device that can stand-alone or slide easily into a detector rack. Its advanced microcontroller-based communication circuitry passes real-time detection states or alarms as discrete detector outputs to a traffic controller or other control system. The MVP configures the input and outputs on the detector port master automatically.

The detector port master is suitable for detection systems in all TS2 cabinets. The real-time detector outputs from the rear edge connectors or front connector are fully compatible with existing loop detector systems.

The simple design using a single circuit board and faceplate allows easy insertion into a 4-channel slot of a standard detector rack or equivalent enclosure.

Visual indications show the operational status and health of the detector port master and the networked MVPs connected at the communication interface panel. The modular cabinet interface unit shall provide 8 phase inputs and 16 detector outputs.

Detector Port Master For Solo Terra: (SAP# 11032, Stock# 14-07-0112)

The modular cabinet interface unit shall provide the hardware and software means for up to eight (8) MVP sensors to communicate real-time detection states and alarms to a local traffic signal controller. It shall comply with the electrical and protocol specifications of the detector rack standards. The card shall have 1500 Vrms isolation between rack logic ground and street wiring.

The modular cabinet interface unit shall be a simple interface card that plugs directly into a 170 input file rack or a NEMA type C or D detector rack. The modular cabinet interface unit shall occupy only 2 slots of the detector rack. The modular cabinet interface unit shall accept up to sixteen (16) phase inputs and shall provide up to twenty-four (24) detector outputs.

TS1 Input/Output Harness for Solo Terra: (SAP# 11033, Stock# 14-07-0114)

Harness to include 16 inputs and 24 outputs to connect to front of Detector Port Master for Solo Terra.

Includes connecting cable from Terra Interface Panel to Detector Port Master for Solo Terra.

TS2 Input/Output SDLC Harness for Solo Terra: (SAP# 11034, Stock# 14-07-0116)

SDLC cable to have 32 inputs and 64 outputs that connects to the port 1 connector on the front of the Detector Port Master for Solo Terra and a TS2 controller that accepts SDLC.

Includes connecting cable from Terra Interface Panel to Detector Port Master for Solo Terra.

Communications Interface Panel: (SAP# 11035, Stock# 14-07-0120)

The communications interface panel shall support from one to four machine vision processors (MVPs). The communications interface panel consists of a predefined wire termination block for MVP power, data and video connections, a power transformer for each MVP, electrical surge protectors to isolate the modular cabinet interface unit and MVP, and an interface connector to cable directly to the modular cabinet interface unit. The connection from the MVP(s) to the communications interface panel shall be via twisted pair and not coaxial cable. Manufacturer shall either supply their recommended twisted pair cable for one continuous run from MVP to communications interface panel or a piece long enough that can easily be spliced with 5 1/2 pair twisted pair cable in accordance to agency splicing standards.

The interface panel shall provide power for at least one MVP through a step-down transformer, taking local line voltage and producing 28 VAC. 4 step-down transformers shall be included on communication interface panel.

Communication interface panel shall convert MVP RS-485 and differential video to RS-232 and composite video with BNC interface. Each MVP connected to the communication interface panel shall have a separate full motion color video output via a BNC interface.

The communication interface panel shall support transmission distances up to and greater than 6.4 km (4 mi) where networked communications are not available. Two

twisted-pair copper wires are required from the upstream or downstream cabinet to support networked Supervisor communications. This daisy chaining will allow the user to remotely connect to the head end and have full software access to each MVP that is daisy chained. Standard modems may be connected to the panel through the supervisor connector, providing affordable modem access to remote communications.

Gas discharge tubes are to be included on the communication interface panel to absorb high-energy transients. The transient protection can absorb transients up to 20 kilovolt Amperes for a period of 20 milliseconds or less, with no permanent system damage.

LEDs on panel shall indicate integrity of communication infrastructure.

Communications Interface Panel For Solo Terra: (SAP# 11036, Stock# 14-07-0135)

The communications interface panel shall support up to eight MVPs. The communications interface panel shall accept 110/220 VAC, 50/60 Hz power and provide predefined wire termination blocks for MVP power connections, a Broadband-over-Power-Line (BPL) transceiver to support up to 10MB/s interdevice communications, electrical surge protectors to isolate the modular cabinet interface unit and MVP sensors, and an interface connector to cable directly to the modular cabinet interface unit.

The interface panel shall provide power for up to eight (8) MVP sensors, taking local line voltage 110/220 VAC, 50/60 Hz and producing 110/220 VAC, 50/60 Hz, at about 30 watts to each MVP sensor. Two ½-amp SLO-BLO fuses shall protect the communications interface panel.

Mounting Bracket (Horizontal): (SAP# 11016, Stock# 14-07-0010)

10" pedestal mount is medium duty aluminum construction of No. 1-1/2 pipe for up to 40 lb. loads, white powder coat finish, and three slots suitable for ¾" stainless-steel mounting straps. Manually adjustable swivel head provides 75-degree tilt and over 300-degrees rotation for 4.25" video sensor base. Stainless-steel bolts and Allen screws provide positive locking mechanism. Typical usage includes aiming video sensor obliquely away from mast arm or luminaire arm mount.

Mounting Bracket (Vertical): (SAP# 11017, Stock# 14-07-0020)

18" "L" mount is medium duty aluminum construction of No. 1-1/2 pipe for up to 40 lb. loads, white powder coat finish, and three slots suitable for ¾" stainless-steel mounting straps. Manually adjustable swivel head provides 75-degree tilt and unlimited 360-

degrees rotation for 4.25" video sensor base. Stainless-steel bolts provide positive locking mechanism. Typical usage includes aiming video sensor from one side of vertical pole, such as a wood pole or below another device on a metal/concrete pole.

Mounting Bracket (Top of luminaire): (SAP# 11018, Stock# 14-07-0030)

28" pedestal mount is medium duty aluminum construction of No. 1-1/2 pipe for up to 40 lb. loads, white powder coat finish, and three slots suitable for 3/4" stainless-steel mounting straps. Manually adjustable swivel head provides 75-degree tilt and over 300-degrees rotation for 4.25" video sensor base. Stainless-steel bolts and Allen screws provide positive locking mechanism. Typical usage includes aiming video sensor approximately inline with luminaire arm mount.

Mounting Bracket (74" High): (SAP# 11019, Stock# 14-07-0032)

74" video detection bracket system to be used for either horizontal or vertical mounting. is medium duty aluminum construction of No. 1-1/2 pipe for up to 40 lb. loads, white powder coat finish, and three slots suitable for 3/4" stainless-steel mounting straps. Manually adjustable swivel head provides 75-degree tilt and over 300-degrees rotation for 4.25" video sensor base. Stainless-steel bolts and Allen screws provide positive locking mechanism. Typical usage includes aiming video sensor approximately inline with luminaire arm mount.

Image Sensor Pigtail Cable (60'): (SAP# 11020, Stock# 14-07-0035)

Each integrated video sensor shall have a pigtail cable assembly for power and several communications circuits. A molded MS-18-14 connector shall connect to the rear of the integrated video sensor. The cable assembly shall come in 60' length.

The molded connector shall be of MS bayonet type, style 14-18S female. The over mold shall be black UV-grade thermoplastic polyurethane with video sensor logo. The molded connector shall bond with the cable jacket of similar material to withstand the outdoor environment (as defined by appropriate standards). The cable jacket shall be resistant to heat, oil, and aqueous fluids, including acids and bases. The cable assembly shall have a tensile strength in excess of 2000 psi. The cable shall be 5-1/2 twisted pairs for power, Earth ground, Supervisor communications, detector port communications, and analog video. Each wire shall be 18 AWG. Each pair shall be labeled and the cable assembly shall be labeled with the manufacturer's part number. The cable shall have an overall shield and drain wire of 18 AWG.

Image Sensor Pigtail Cable (80'): (SAP# 11021, Stock# 14-07-0040)

Each integrated video sensor shall have a pigtail cable assembly for power and several communications circuits. A molded MS-18-14 connector shall connect to the rear of the integrated video sensor. The cable assembly shall come in 80' length.

The molded connector shall be of MS bayonet type, style 14-18S female. The over mold shall be black UV-grade thermoplastic polyurethane with video sensor logo. The molded connector shall bond with the cable jacket of similar material to withstand the outdoor environment (as defined by appropriate standards). The cable jacket shall be resistant to heat, oil, and aqueous fluids, including acids and bases. The cable assembly shall have a tensile strength in excess of 2000 psi. The cable shall be 5-1/2 twisted pairs for power, Earth ground, Supervisor communications, detector port communications, and analog video. Each wire shall be 18 AWG. Each pair shall be labeled and the cable assembly shall be labeled with the manufacturer's part number. The cable shall have an overall shield and drain wire of 18 AWG.

Image Sensor Pigtail Cable (150'): (SAP# 11022, Stock# 14-07-0050)

Each integrated video sensor shall have a pigtail cable assembly for power and several communications circuits. A molded MS-18-14 connector shall connect to the rear of the integrated video sensor. The cable assembly shall come in 150' length.

The molded connector shall be of MS bayonet type, style 14-18S female. The over mold shall be black UV-grade thermoplastic polyurethane with video sensor logo. The molded connector shall bond with the cable jacket of similar material to withstand the outdoor environment (as defined by appropriate standards). The cable jacket shall be resistant to heat, oil, and aqueous fluids, including acids and bases. The cable assembly shall have a tensile strength in excess of 2000 psi. The cable shall be 5-1/2 twisted pairs for power, Earth ground, Supervisor communications, detector port communications, and analog video. Each wire shall be 18 AWG. Each pair shall be labeled and the cable assembly shall be labeled with the manufacturer's part number. The cable shall have an overall shield and drain wire of 18 AWG.

Image Sensor Pigtail Cable (200'): (Stock# 14-07-0052)

Each integrated video sensor shall have a pigtail cable assembly for power and several communications circuits. A molded MS-18-14 connector shall connect to the rear of the integrated video sensor. The cable assembly shall come in 200' length.

The molded connector shall be of MS bayonet type, style 14-18S female. The over mold shall be black UV-grade thermoplastic polyurethane with video sensor logo. The

molded connector shall bond with the cable jacket of similar material to withstand the outdoor environment (as defined by appropriate standards). The cable jacket shall be resistant to heat, oil, and aqueous fluids, including acids and bases. The cable assembly shall have a tensile strength in excess of 2000 psi. The cable shall be 5-1/2 twisted pairs for power, Earth ground, Supervisor communications, detector port communications, and analog video. Each wire shall be 18 AWG. Each pair shall be labeled and the cable assembly shall be labeled with the manufacturer's part number. The cable shall have an overall shield and drain wire of 18 AWG.

Image Sensor Pigtail Cable (250'): (SAP# 11023, Stock# 14-07-0054)

Each integrated video sensor shall have a pigtail cable assembly for power and several communications circuits. A molded MS-18-14 connector shall connect to the rear of the integrated video sensor. The cable assembly shall come in 250' length.

The molded connector shall be of MS bayonet type, style 14-18S female. The over mold shall be black UV-grade thermoplastic polyurethane with video sensor logo. The molded connector shall bond with the cable jacket of similar material to withstand the outdoor environment (as defined by appropriate standards). The cable jacket shall be resistant to heat, oil, and aqueous fluids, including acids and bases. The cable assembly shall have a tensile strength in excess of 2000 psi. The cable shall be 5-1/2 twisted pairs for power, Earth ground, Supervisor communications, detector port communications, and analog video. Each wire shall be 18 AWG. Each pair shall be labeled and the cable assembly shall be labeled with the manufacturer's part number. The cable shall have an overall shield and drain wire of 18 AWG.

Image Sensor Pigtail Cable (300'): (SAP# 11024, Stock# 14-07-0060)

Each integrated video sensor shall have a pigtail cable assembly for power and several communications circuits. A molded MS-18-14 connector shall connect to the rear of the integrated video sensor. The cable assembly shall come in 300' length.

The molded connector shall be of MS bayonet type, style 14-18S female. The over mold shall be black UV-grade thermoplastic polyurethane with video sensor logo. The molded connector shall bond with the cable jacket of similar material to withstand the outdoor environment (as defined by appropriate standards). The cable jacket shall be resistant to heat, oil, and aqueous fluids, including acids and bases. The cable assembly shall have a tensile strength in excess of 2000 psi. The cable shall be 5-1/2 twisted pairs for power, Earth ground, Supervisor communications, detector port communications, and analog video. Each wire shall be 18 AWG. Each pair shall be labeled and the cable assembly shall be labeled with the manufacturer's part number. The cable shall have an overall shield and drain wire of 18 AWG.

Image Sensor Pigtail Cable (350'): (Stock# 14-07-0062)

Each integrated video sensor shall have a pigtail cable assembly for power and several communications circuits. A molded MS-18-14 connector shall connect to the rear of the integrated video sensor. The cable assembly shall come in 350' length.

The molded connector shall be of MS bayonet type, style 14-18S female. The over mold shall be black UV-grade thermoplastic polyurethane with video sensor logo. The molded connector shall bond with the cable jacket of similar material to withstand the outdoor environment (as defined by appropriate standards). The cable jacket shall be resistant to heat, oil, and aqueous fluids, including acids and bases. The cable assembly shall have a tensile strength in excess of 2000 psi. The cable shall be 5-1/2 twisted pairs for power, Earth ground, Supervisor communications, detector port communications, and analog video. Each wire shall be 18 AWG. Each pair shall be labeled and the cable assembly shall be labeled with the manufacturer's part number. The cable shall have an overall shield and drain wire of 18 AWG.

Image Sensor Splice Cable (1000'): (SAP# 11025, Stock# 14-07-0070)

If a splice is needed from the pigtail to the communication interface panel in the traffic control cabinet, the same cable as the pigtail to be supplied without the MS connector. A 1000' spool to be supplied.

The cable jacket shall be resistant to heat, oil, and aqueous fluids, including acids and bases. The cable assembly shall have a tensile strength in excess of 2000 psi. The cable shall be 5-1/2 twisted pairs for power, Earth ground, Supervisor communications, detector port communications, and analog video. Each wire shall be 18 AWG, with the exception of the power and ground wires, which shall be 16 AWG. The cable shall have an overall shield and drain wire of 18 AWG.

Image Sensor Splice Cable 3-Wire (1000'): (SAP# 11026, Stock# 14-07-0075)

This specification sets forth the minimum requirements for the Machine Vision Processor with Ethernet and MPEG4 Encoder cable. This "three wires only" cable is designed for 110VAC use between the Machine Vision Processor and the traffic control cabinet. Simple field termination to the EasyLock connector on the MVP makes this the only cable needed for power, video, and communications. This cable must be extremely durable and easy to install in underground conduit systems. This cable was designed to accommodate the water-resistant requirements and low pulling tension necessary for conduit applications.

Cable Construction:

The cable shall consist of three conductors 18 AWG with an overall UV-resistant Low Density Polyethylene jacket.

18 AWG Components: Three conductors, 18 AWG, 19 strands of 30 gauge tin-plated copper conductor diameter .046"/.052"

Conductor Insulation: Extruded polyethylene 200 with nominal .030" wall thickness
Colors: Black, green, and white

Jacket: Extruded black polyethylene .040"/.050" wall thickness, UV-resistant

Finished Diameter: .330" - .354" maximum

Electrical: 600 volts (rms)

Surveillance Camera: (SAP# 11037, Stock# 14-07-5000)

The surveillance camera system shall be a discreet, miniature camera dome system consisting of a dome drive with a variable speed/high speed pan and tilt drive unit with continuous 360° rotation, ¼-inch high resolution color CCD camera, motorized zoom lens with optical and digital zoom and auto-focus.

The camera system shall be capable of 12X electronic and 22X optical zoom or equivalent to the latest high-end Pelco zoom lens. The video output shall be 1 volt peak to peak, 75ohm.

The camera system shall include a serial RS232, RS422, or RS485 interface for PTZ control. The serial and video interface of the camera system shall be compatible with mainstream Video Server technology for the purpose of transmitting video and PTZ data over an Ethernet medium.

The camera system shall have a minimum hardened temperature range of -20°C to +50°C continuous operation.

1 Port Video Server: (SAP# 11038, Stock# 14-07-5020)

The 1 port video server shall be designed for high-resolution video monitoring and surveillance applications. The video server shall include a single 75ohm composite input. The video server shall be capable of a maximum of 30 frames per second (fps) over 10/100Base-T networks using a CAT5, fiber optic, or wireless medium. The video server shall be capable of MPEG4 and Motion JPEG.

The video server shall include an RJ45 Ethernet 10/100 interface and shall provide secure Web access capabilities using Internet Explorer for the purpose of viewing live video. The Live video frame rate shall be dependent on the communications infrastructure and user defined settings such as quality, compression, and resolution. The Internet Explorer interface shall provide PTZ control capabilities.

The video server shall provide a serial interface for PTZ control compatible with Pelco-D and Pelco-P code protocols. The video server shall include an RS232 serial or RJ45 Ethernet interface for setup and configuration of the device. The video server shall have, at a minimum, an LED for Power and an LED for 10/100 link/activity status.

4 Port Video Server: (SAP# 11039, Stock# 14-07-5040)

The 4 port video server shall be designed for high-resolution video monitoring and surveillance applications. The video server shall include four 75ohm composite inputs. The video server shall be capable of a maximum of 30 frames per second (fps) over 10/100Base-T networks using a CAT5, fiber optic, or wireless medium. The video server shall be capable of MPEG4 and Motion JPEG.

The video server shall include an RJ45 Ethernet 10/100 interface and shall provide secure Web access capabilities using Internet Explorer for the purpose of viewing live video. The Live video frame rate shall be dependent on the communications infrastructure and user defined settings such as quality, compression, and resolution. The Internet Explorer interface shall provide PTZ control capabilities.

The video server shall provide a serial interface for PTZ control compatible with Pelco-D and Pelco-P code protocols. The video server shall include an RS232 serial or RJ45 Ethernet interface for setup and configuration of the device. The video server shall have, at a minimum, an LED for Power and an LED for 10/100 link/activity status.

Wireless Ethernet Radio: (SAP# 11040, Stock# 14-07-5100)

The wireless Ethernet radio system shall meet the following specifications:

- 5.150–5.825 GHz radios supplied must meet FCC part 15 rules and IC RS210.
- 5.150–5.825 GHz radio will provide the highest data rates (108Mbps) along with the most robust industry-established security features available. The radio must be compatible with high bandwidth, long range industrial application, which equals the Intuicom Model EB-58 Broadband radio.
- Radios must be compatible to OFDM-based technology and 802.11a standard protocol. The Radios will also have security equal to WEP Encryption, WPA, WPA2, (including AES CCMP, TKIP), and MAC/RADIUS Authentication.
- Adaptive modulation – RF link is monitored to automatically adjust the data rate to optimize the maximum link performance.
- Radios will support these Networking Features: Spanning Tree Protocol, DHCP, NTP, SNMP, VLAN, Routing, QOS (802.11e/WMM), and Multicasting.

- Radios provide embedded web-based configuration and diagnostic menus. A complete software toolset to assist in design, configure, monitor and optimize your wireless network.
- Manufacturing of radios will be in the United States of America with 100% performance testing over operating temperatures of -40 °C to +85 °C (-40o to +185o F).
- Radios will be powered by POE (Powered over Ethernet) Injector with surge protection. This will include 160 ft of Cat.5 or better Industrial Outdoor rated cable.
- Limited warranty period for defects in materials or workmanship under normal use and service for a period of two (2) years from the date of delivery.

Radio

- 5.150–5.825 GHz License Free (U-NII) Bands:
 - Low - 5.15 to 5.25 GHz at 17dBm, 4-channels
 - Middle - 5.25 to 5.35 GHz at 24dBm, 4-channels
 - High - 5.72 to 5.82 GHz at 26dBm, 5-channels
- Data Rate Channels:
 - Full : 20 MHz
 - Half: 10 MHz
 - Quarter: 5 MHz
- Typical Range:
 - 20 miles (LOS)
- Operating Modes:
 - Point to Point
 - Point to Multipoint
 - WDS (MESH)
- Modulation Schemes:
 - Orthogonal Frequency-Division Multiplexing(OFDM)
 - Adaptive modulation – RF link is monitored to automatically adjust the data rate to optimize the maximum link performance.
- Available Configurations:
 - Access Point
 - Station
 - WDS (MESH)
- Operating Temperature:
 - -40°C to +85°C
- Input Voltage:
 - Power over Ethernet (POE) Injector:
 - 100 to 240VAC with surge protection

- Enables both Power and Data. to be carried over Ethernet cable

Transmitter/Receiver

- RF Output Power:
 - 26dBm (programmable)
- Receiver Sensitivity:
 - 6Mbps = -94dBm
 - 9Mbps = -93dBm
 - 12Mbps = -91dBm
 - 18Mbps = -90dBm
 - 24Mbps = -86dBm
 - 36Mbps = -83dBm
 - 48Mbps = -77dBm
 - 54Mbps = -74dBm

Data Rate

- 6 Mbps to 108 Mbps

Physical Interface

- Data Interface:
 - Ethernet:
 - 10/100BaseT, RJ45
 - 160ft of Cat.5 / Industrial Outdoor rated cable included
- Antenna Interface:
 - Integrated Enclosure Solution, 23dBi
 - IP67 Weatherproof Rating
 - Pole Mount, External Antenna Port N(F)
 - Panel, Sector, Omni

Configuration & Management

- Configuration
 - HTTP
 - SNMP
 - IP Auto-Discover
- Management
 - Antenna Alignment Tool
 - Real Time Link Monitoring
 - RSSI
 - Noise Levels
 - LAN Statistics
 - WLAN Statistics/Errors
 - Uptime

Each Integrated package includes the following:

- 1 - 23dBi Panel Antenna with Integrated Radio
- 1 - 150ft of CAT5 Outdoor rated Ethernet Cable (connects integrated radio to POE)
- 1 - Power-Over-Ethernet Injector; w/ surge protection

Ethernet Switch Managed: (SAP# 11041, Stock# 14-07-5200)

The managed Ethernet switch for wireless applications shall be consistent with IEEE 802.3 standards. The managed Ethernet switch shall be capable of 10/100, Full/Half Duplex auto-negotiation. The managed Ethernet switch shall include a minimum of six Ethernet 10/100 RJ45 ports. The managed Ethernet switch shall include MAC address storage capability and "Store-and-Forward" switching capability.

The managed Ethernet switch configuration shall include the ability to restrict bandwidth usage on attached devices by way of MAC address or by way of IP address. The managed Ethernet switch shall be accessible from anywhere on the common Network by way of Telnet, HTTP, or SNMP.

The managed Ethernet Switch shall have a minimum extended temperature range of -40°C to +85°C and a humidity range of 10-90% non-condensing. The managed Ethernet switch shall include, at a minimum, a LED for power and a LED for 10/100 connection status(for each port).

All copper ports shall be type RJ-45 and shall auto-negotiate for speed(i.e., 10/100Base), duplex(i.e., full or half) and polarity. All 10/100BaseTX ports shall meet the Category 5 specifications and shall be compliant with the EIA/TIA-568-A standard pinouts.

The switch shall have the ability to support the Layer 2+ management features commonly found in managed non-environmental Ethernet switches. These features shall include, but not be limited to:

- The STP healing rate shall meet or exceed specifications published in the 802.1D standard;
- The RSTP healing rate shall meet or exceed specifications published in the IEEE 802.1W standard;
- The switch shall support port-based VLANs that meet or exceed specifications as published in the IEEE 802.1Q standard;
- The forwarding/filtering rate shall be 14,880 packets per second(PPS) for 10 Mbps and 148,800 PPS for 100 Mbps and 1,488,000 PPS for 1000 Mbps;
- The switch shall have a minimum 8-kilobit MAC address table;
- The shall support, at a minimum, Version 2 of the Internet Group Management Protocol(IGMP);

- The switch shall include the electronics required for Simple Network Management Protocol(SNMP V2). The switch shall be accessed using the resident EIA-232 management port, a telecommunication network or the Trivial File Transfer Protocol(TFTP);
- The switch shall support remote monitoring(RMON) groups 1,2,3,9;
- The switch shall support management via Telnet and Web;
- The switch shall support the TFTP, the Network Time Protocol(NTP), and the Simple Network Time Protocol(SNTP);
- The switch shall support Broadcast Rate Limiting;
- The shall include integrated AC power supply;

The Ethernet switch should come with a 5 year warranty.

Security Appliance for Field Devices: (SAP# 11042, Stock# 14-07-5210)

The Security Appliance shall create a secure, virtual-network layer connection between the remote user and the traffic control network. This appliance shall use the Uniloc® NetANCHOR™ patented Device Fingerprinting Technology to establish a Secure Private Network between an authorized traffic management system and individual field appliances.

The Security Appliance System shall:

- Provide network security for field traffic-control systems by creating a secure, virtual-network layer connection, between the remote user and the traffic control network, thus blocking unauthorized access and external cyber-threats.
- Create a secure, virtual-network layer connection, which improves upon traditional router, switch, and firewall security mechanisms.
- Provide Traffic Management Systems with secure private tunneling across public network segments, including, but not exclusive to, wireless (CDMA, GSM, 802.11a/b/g) and the public Internet (802.3, DSL, Cable).
- Provide a point-to-multipoint "Secure Private Network" between the TMC and each field traffic cabinet
- Include device fingerprinting technology to restrict field control access to designated computer terminals at the TMC, or between management centers (Center-to-Center Communications), thus providing only authorized computer terminals exclusive access to the secure private network.

The Security Appliance Hardware shall include:

- Self-test on power-up
- LED indicators for power and communications link/activities status
- Shelf-Mount, DIN Rail and Screw-Mount mounting options for easy in-cabinet placement
- 120VAC
- Consumption, current - 8Watts / 0.3A

- 1 WAN, 4 LAN, RJ45, 10/100 Mbit/s Ethernet
- -29 F to +165 F (-34 C to +74 C) operating temperature range
- 0 to 95% relative humidity

The Security Appliance internal Processor shall provide, at a minimum:

- Motorola® MPC8321EEC Microprocessor
- 333MHz core processor speed
- 32Mb Flash Memory
- 64Mb DDR2 Memory
- Up to 32 Mbps Secure Private Network and Virtual Private Network (VPN) Throughput

Managed Ethernet Switch: (10/100BaseT) w/ 2 Ports, 100FX, Single-Mode Fiber, 20km w/ LC Connector (SAP# 11043, Stock# 14-07-5220)

The managed Ethernet fiber switch shall be consistent with IEEE 802.3 standards. The managed Ethernet switch shall be capable of 10/100, Full/Half Duplex auto-negotiation. The managed Ethernet switch shall include a minimum of six Ethernet 10/100 RJ45 ports. The managed Ethernet switch shall include MAC address storage capability and "Store-and-Forward" switching capability.

The managed Ethernet switch configuration shall include the ability to restrict bandwidth usage on attached devices by way of MAC address or by way of IP address. The managed Ethernet switch shall be accessible from anywhere on the common Network by way of Telnet, HTTP, or SNMP.

The managed Ethernet Switch shall have a minimum extended temperature range of -40°C to +85°C and a humidity range of 10-90% non-condensing. The managed Ethernet switch shall include, at a minimum, a LED for power and a LED for 10/100 connection status(for each port).

All fiber optic link ports shall operate at 1310 or 1550 nanometers in single mode and should be capable of transmitting up to 20 kilometers. The optical ports shall be type LC or SC only. The switch shall have a minimum of two optical 100FX ports that are capable of transmitting data at a minimum of 100 Mbps. Each optical port shall consist of a pair of fibers; one fiber will transmit (TX) data and one fiber will receive (RX) data.

All copper ports shall be type RJ-45 and shall auto-negotiate for speed(i.e., 10/100Base), duplexity(i.e., full or half) and polarity. All 10/100BaseTX ports shall meet the Category 5 specifications and shall be compliant with the EIA/TIA-568-A standard pinouts.

The switch shall have the ability to support the Layer 2+ management features

commonly found in managed non-environmental Ethernet switches. These features shall include, but not be limited to:

- The STP healing rate shall meet or exceed specifications published in the 802.1D standard;
- The RSTP healing rate shall meet or exceed specifications published in the IEEE 802.1W standard;
- The switch shall support port-based VLANs that meet or exceed specifications as published in the IEEE 802.1Q standard;
- The forwarding/filtering rate shall be 14,880 packets per second(PPS) for 10 Mbps and 148,800 PPS for 100 Mbps and 1,488,000 PPS for 1000 Mbps;
- The switch shall have a minimum 8-kilobit MAC address table;
- The shall support, at a minimum, Version 2 of the Internet Group Management Protocol(IGMP);
- The switch shall include the electronics required for Simple Network Management Protocol(SNMP V2). The switch shall be accessed using the resident EIA-232 management port, a telecommunication network or the Trivial File Transfer Protocol(TFTP);
- The switch shall support remote monitoring(RMON) groups 1,2,3,9;
- The switch shall support management via Telnet and Web;
- The switch shall support the TFTP, the Network Time Protocol(NTP), and the Simple Network Time Protocol(SNTP);
- The switch shall support Broadcast Rate Limiting;
- The shall include integrated AC power supply;

The Ethernet switch should come with a 5 year warranty.

Managed Gigabit Ethernet Switch: (10/100BaseT) w/ 2 Ports, 1000LX, Single-Mode Fiber, 25km w/ LC Connector (SAP# 11044, Stock# 14-07-5240)

The managed Ethernet Gigabit switch shall be consistent with IEEE 802.3 standards. The managed Ethernet switch shall be capable of 10/100, Full/Half Duplex auto-negotiation. The managed Ethernet switch shall include a minimum of six Ethernet 10/100 RJ45 ports. The managed Ethernet switch shall include MAC address storage capability and "Store-and-Forward" switching capability.

The managed Ethernet switch configuration shall include the ability to restrict bandwidth usage on attached devices by way of MAC address or by way of IP address. The managed Ethernet switch shall be accessible from anywhere on the common Network by way of Telnet, HTTP, or SNMP.

The managed Ethernet Switch shall have a minimum extended temperature range of -40°C to +85°C and a humidity range of 10-90% non-condensing. The managed

Ethernet switch shall include, at a minimum, a LED for power and a LED for 10/100 connection status(for each port).

All fiber optic link ports shall operate at 1310 or 1550 nanometers in single mode and should be capable of transmitting up to 25 kilometers. The optical ports shall be type LC or SC only. The switch shall have a minimum of two optical 1000LX ports that are capable of transmitting data at a minimum of 1000 Mbps. Each optical port shall consist of a pair of fibers; one fiber will transmit (TX) data and one fiber with receive (RX) data.

All copper ports shall be type RJ-45 and shall auto-negotiate for speed(i.e., 10/100Base), duplexity(i.e., full or half) and polarity. All 10/100BaseTX ports shall meet the Category 5 specifications and shall be compliant with the EIA/TIA-568-A standard pinouts.

The switch shall have the ability to support the Layer 2+ management features commonly found in managed non-environmental Ethernet switches. These features shall include, but not be limited to:

- The STP healing rate shall meet or exceed specifications published in the 802.1D standard;
- The RSTP healing rate shall meet or exceed specifications published in the IEEE 802.1W standard;
- The switch shall support port-based VLANs that meet or exceed specifications as published in the IEEE 802.1Q standard;
- The forwarding/filtering rate shall be 14,880 packets per second(PPS) for 10 Mbps and 148,800 PPS for 100 Mbps and 1,488,000 PPS for 1000 Mbps;
- The switch shall have a minimum 8-kilobit MAC address table;
- The shall support, at a minimum, Version 2 of the Internet Group Management Protocol(IGMP);
- The switch shall include the electronics required for Simple Network Management Protocol(SNMP V2). The switch shall be accessed using the resident EIA-232 management port, a telecommunication network or the Trivial File Transfer Protocol(TFTP);
- The switch shall support remote monitoring(RMON) groups 1,2,3,9;
- The switch shall support management via Telnet and Web;
- The switch shall support the TFTP, the Network Time Protocol(NTP), and the Simple Network Time Protocol(SNTP);
- The switch shall support Broadcast Rate Limiting;
- The shall include integrated AC power supply;

The Ethernet switch should come with a 5 year warranty.

Ethernet to Serial Converter: (SAP# 11045, Stock# 14-07-5260)

The Ethernet serial converter shall be consistent with IEEE 802.3 standards for Ethernet and the EIA/TIA standards for RS232 and RS485 ports. The Ethernet serial converter shall be capable of 10/100, Full/Half Duplex auto-negotiation on the copper Ethernet port.

The Ethernet serial converter shall be able to transmit serial data over an IP network and support Baud rates up to 230 kbps. The Ethernet serial converter shall be accessible from anywhere on the common IP/Ethernet Network by way of Telnet, HTTP, or SNMP.

The Ethernet serial converter shall have a minimum extended temperature range of -40°C to +85°C and a humidity range of 10-90% non-condensing. The Ethernet serial converter shall include, at a minimum, a LED for power, a LED for 10/100 connection status for the Ethernet port and a LED for both Transmit(TX) and Receive(RX) for the serial port.

The single copper Ethernet port shall be type RJ-45 and shall auto-negotiate for speed(i.e., 10/100Base), duplexity(i.e., full or half) and polarity. The 10/100BaseTX port shall meet the Category 5 specifications and shall be compliant with the EIA/TIA-568-A standard pinouts.

The Ethernet serial converter shall include integrated AC Power supply.

The Ethernet serial converter should come with a 5 year warranty.

CDMA Modem: (SAP# 11046, Stock# 14-07-5280)

CDMA will have the following specifications. In addition, an environmentally hardened power supply, along with an antenna will be included.

Gateway Features

- Always-On Connection
- DHCP server for local automatic IP assignment
- Public and Private IP modes for local IP assignment
- Support for SNMPv2c and SNMPv3
- NAT with VPN Passthru
- Basic Firewall
- Domain name addressable

High-Speed 1X Data Connections

- Rugged device for mobile data 1X data connections

- High-speed connectivity for any Ethernet enabled PC, router, or remote device
- Backup network connectivity for routers and servers

Popular Applications

- Cost-effective replacement for landline dialup circuits or analog cell-phones
- Out-of-band network device management
- Primary connectivity for PLCs, RTUs, POS, ATM solutions
- Backup/redundant network connections for LANs

SPECIAL FEATURES

- High speed data transfer rate
- Full duplex transceiver
- Low power consumption
- Compact size
- Rugged aluminum case
- LED network status indicators
- Support for DHCP and static IP Assignment
- Remotely manageable and upgradeable
- Optional mounting kit

EasyLock Connector: (SAP# 50910)

Connector used for terminating the cable connection to the camera.

Pole Mounted Communications Cabinet: (SAP# 11047, Stock# 14-07-5300)

Supplier of video detection system and video surveillance system shall also include a pole mounted_336s cabinet to house all necessary equipment. This aluminum cabinet shall meet the following specifications:

- 46 in height x 24 in width x 22 in depth
- front and rear doors with full length piano hinges
- complete insulation
- 1-fan panel
- 2-corbins door locks
- 1-front light mod assembly
- 1-rear light mod assembly
- 1-drawer assembly
- 2-full width/ depth shelves
- 1-24 volts power supply
- 1-gfi receptacle
- 4-convenience receptacles
- 1-generator power connection
- 1-edco sha1250 surge protection w/base

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- 1-edco pc642 communication surge arrestor
- 1-terminal block

COOPERATIVE PURCHASE AGREEMENT

State Agencies, Political Subdivisions of the State and Quasi State Agencies may be permitted to purchase from contracts made by the Department of Transportation and Development's Procurement Section.

The Bidder may, at his option, accept this Cooperative Purchase Agreement so that any contract awarded under this proposal will apply to other State Agencies, Political Subdivisions or Quasi Agencies.

Bidder hereby accepts this Cooperative Purchase Agreement so that any contract awarded will apply to other State Agencies, Quasi State Agencies or other Political Subdivisions of the State.

_____ Yes, I agree to accept Cooperative Purchase Agreement

_____ No, I do not accept Cooperative Purchase Agreement

Failure to mark "no" on the above will constitute acceptance of this Cooperative Purchase Agreement to other State Agencies, Political Subdivisions of the State and Quasi State Agencies.

Choosing not to accept this Cooperative Purchase Agreement will have no bearing on the award of the contract.

ORDERS: Other State Agencies are to issue contract release orders/purchase orders for the items required, as and when needed.

Political subdivisions of the State and Quasi Agencies who have been authorized by the Office of State Purchasing to purchase from contracts made by the Department of Transportation and Development are to issue their regular purchase orders directly to the Contractor, making reference to the Contract Number, Item Number (if applicable) and Contract Expiration Date.

CONTRACT ADMINISTRATION: The Department of Transportation and Development will not monitor, administer or resolve any discrepancies, controversies, invoicing or payments related to this contract on orders placed by other State Agencies, Political Subdivisions or Quasi Agencies.

Controversies between the Department of Transportation and Development and a Contractor will be resolved by the DOTD Procurement Director.

Controversies between other State Agencies and a Contractor will be resolved by the Director of State Purchasing in accordance with R.S. 39:1673.

It will be the responsibility of the ordering entity to correspond directly with the Contractor.

DELIVERY: Vendors accepting the Cooperative Purchase Agreement understand and agree that deliveries to other State Agencies, Political Subdivisions or Quasi Agencies will be on a statewide basis.