

CITY OF LAKELAND
TRAFFIC SIGNAL REQUIREMENTS

TABLE OF CONTENTS

| | |
|--|----|
| CCTV Camera System _____ | 2 |
| Local Managed Ethernet Switches _____ | 5 |
| MPEG-2 Encoder _____ | 5 |
| MPEG-2 Video Decoding Software _____ | 6 |
| Controller Software _____ | 6 |
| Controller Cabinet – Model 332A or B _____ | 8 |
| Controller Cabinet – Model 336s _____ | 10 |
| Pedestrian Push Button _____ | 12 |
| Illuminated Street Name Sign _____ | 12 |
| Mast Arms and Poles _____ | 13 |
| Cabinet-Mounted Interconnect Centers _____ | 13 |

The following items are descriptions of the minimum required specifications.

CCTV Camera System

General:

- Include a control circuit, attachment assembly, cable, connectors, and all necessary hardware.
- Provide the capability of precise manual control of variable speed camera adjustments of zooming, panning and tilting.
- Continuous full-time auto focus with day night capability.
- Enclosed in a single dome type unit.
- According to the zoom factor, the camera shall provide automatic adjustment of the pan speed ranges.
- The same amount of picture shall continuously appear to move across a monitor regardless of the pan speed or zoom factor.
- Use direct motor drive with no belts.
- Control shall provide smooth, precise, accurate movement.
- Motorized pan, tilt and zoom.
- Communications equipment

CCTV Camera:

- High resolution color
- Advanced DSP
- Use a ¼ inch CCD interline transfer device
- Use a zoom lens with a minimum 230x total zoom with no less than a 23X optical and 10X digital zoom magnification.

Pan/tilt mechanism:

- Incorporate a precision sealed slip ring with continuous rotation of 360 degrees.
- Pan speeds shall range from 0.5 to 100 degrees per second.
- Typical pan speeds shall range from 0.5 to 60 degrees per second.
- Pan and tilt maximum speeds under variable automatic preset control shall be 220 degrees per second.
- Maintain high torque though the complete operating range to ensure precise high and low speed movement.
- Motors shall be high speed DC servo motors using pulse width modulation and encoder feedback to control the acceleration and deceleration speeds.

Shutter:

- Multiple selectable setting options.
- Open shutter programming shall be capable to be manually set on or off.
- The dome shall automatically adjust the shutter speed to the programmed setting for low light conditions.

Dome Assembly:

- Contain a standard single alarm and optional multiple alarm inputs.
- Programmable in the field to receive normally open or closed contacts.

Video output synchronization:

- 2:1 interlace
- NTSC standard line lock
- Adjustable vertical phase

Lens:

- Color corrected
- 4-83mm, F1.6
- Continuous automatic focus and aperture
- Manual override

Dome Unit:

- Attractive
- Not to exceed 8 inches in diameter.
- Designed for use in outdoor locations subject to extreme environmental elements, direct sun, temperatures, wet conditions and dust.
 - Up to wind speeds of 110 mph with a 30 percent gust factor.
 - Temperatures up to 122°F
 - Humidity up to 95% (non-condensing).
- Include an outer sunshade
- Include an inner-aluminum housing with a thermostat, heater, and fans to provide protection and safe operation of the dome with
- Pressurized
- Alarm to indicate low pressure
- Support a minimum of 64 presets.
- Support a home position that automatically returns to a preset position after an unspecified period of activity or number of manipulations.

Dome Assembly:

- Feature a twist-lock release base to allow quick installation and removal of the dome housing/eyeball assembly,
- Capable to accommodate a wide variety of mounts.

Dome Housing:

- Include an integral twist-lock I/O board to provide quick connect/disconnect of the dome from the housing.
- Incorporate “Euro-style” terminal screw connectors for ease of connection, and internal LED’s to verify proper power and communication status.
- Provide for lighting and surge protection of the video, power, alarm input and communication lines.

Dome:

- Support on-screen programming of necessary parameters including but not limited to:
 - Maximum zoom stop
 - Open shutter
 - Privacy zones
 - Directional indicators
 - Line-lock
 - Crystal synchronization
 - AGC
 - White balance
 - Alarm actions
 - Default states
 - Home position
 - Area names
 - Dome
 - Area
 - Preset
 - Pattern
 - Alarm

- Upon initial power up and after the dome resets, diagnostic tests shall be performed for:
 - communication loop-back
 - camera loop-back
 - motor circuits.

The results of these tests shall be displayed on the monitor as directed by the Contractor and/or the City of Lakeland. After initialization is completed, the dome shall automatically return, (pan, tilt and zoom), to its original position.

For CCTV camera installations on new CCTV poles, the design, fabrication, and attachment assembly for the CCTV camera unit will be provided. Also instructions for the installation procedure and a schematic drawing of the attachment will be provided.

The CCTV camera shall be mounted on the side of the pole nearest to the intended direction of view in the best position to best facilitate the operation of the CCTV camera.

Each CCTV camera and pan/tilt/zoom mechanism and its housing shall be electrically bonded to the camera attachment using a minimum #6 AWG braided copper conductor. The bond CCTV camera assembly shall be attached to the pole grounding 3wire that is tied to the cabinet grounding system.

A RS442, 120 VAC power and coaxial video surge suppressors shall be installed. The protectors in the equipment cabinet shall be housed. The ground wires shall not pass through the cabinet.

Local Managed Ethernet Switches

At the local cabinet, the network switches shall provide Ethernet Local Area Network (LAN) communications for each device. The switches shall

- Meet NEMA TS-2 specifications
- Be easily accessible
- Feature both optical and copper Ethernet ports to allow for several devices in a single cabinet to be integrated into the system.

Examples of the equipment to be connected to the LAN switches would be a Type 2070L/Ethernet controller, video control system, and maintenance laptop for direct access to the network from any local cabinet location.

The LAN switches shall provide the following minimum requirements:

- Minimum of four (4) standard RJ-45 10/100Base-T=X copper Ethernet auto-negotiating (IEEE 802.3u) speed ports capable of driving CAT-5 cable
- Two 100Base FX (100 mbps) full duplex fiber optic (uplink) ports with single mode fiber
- Layer 2 switching functions: 802.1p message prioritization, 802.1q VLAN and port based VLAN
- Control transport streams by IGMPv2 (Snooping) and SNMP support for status monitoring and encoding functions
- Network management: spanning tree, RMON, web based management, Telnet, CLI, console port (RS-232) TFTP, and secure shell
- Store and forward switching mode
- Full duplex operation on all ports
- Din rail mounting
- 150 VAC/60 Hz power input
- DB-9 serial port
- Power and data status LED indicators
- Hardware configuration and setup documentation

MPEG-2 Encoder

Network Video Encoders:

- Provide video distribution and connectivity
- Compatible with a Gigabit Ethernet switch using a CAT-5 cable
- Compatible with IMPG multicast
- Capability to be set at 5 Mbps bandwidth to deliver DVD quality video
- Compression standard: MPEG-2 (ISO/IEC 13818)
- Network compatibility; IP standards based
- Video standard format: composite and/or S-video NTSC signal
- Video resolution: MPEG-2 – 720 x 480 (software selectable)
- Frame rate: 30 fps
- Video signal: 1.0 V_{p-p} with 70 ohms impedance

- Network interface: 10Base-T or 100Base-T Ethernet
- Video system management: Local and remote via serial port or Ethernet using SNMP or Telnet
- Provide a session announcement protocol (SAP) advertisement that identifies the streams in the network
- Latency: less than 250 milli-secs. The vendor shall work with the Contractor to determine the optimal technique for addressing the PTZ of the CCTV cameras over IP.
- Field PTZ control: provided via serial port on the encoder device.
- Windows NT, 2000 and XP compatible
- Integrate with existing management tool
- Provide for remote network management of video devices using stand protocol
- Easy to operate using Graphical User Interface (GUI)
- Provide MIB file for integration of the video encoder with third party SNMP managers.
- Integrate with existing SNMP PC client streaming video player
- Integrate with existing SNMP to simultaneously stream video to multiple PC workstations and the video display wall via IP multicast

MPEG-2 Video Decoding Software

- Installed on two new workstations:
- Capable of viewing all CCTV cameras within the system
- Display at least four (4) camera images in full-screen mode per display device
- Compatible with video encoders

Controller Software

- General
 - Type ASC/2070
 - Compatible with 170, NEMA or ITS cabinet
 - Compatible with all 2070, 170, 170E, NEMA TS1 and TS2 – Type 1 or 2 applications
 - Fully support OS-9 multi-tasking real time operating system
 - TS2 Type SDLC compatible communications
 - Multi-system protocol support including: ECPIP, NTCIP, and AB3418
 - Flexible communications options
 - Fully compatible with the traffic management system
 - User friendly menu system with context sensitive help
 - Easy and fast software installation via serial port using a standard PC or laptop
 - Automatically configures for I/O configuration of the Model 2070 hardware when installed
 - Advanced transit signal priority option

- Traffic Control
 - 12 phases, 8 concurrent groups, 2 timing rings
 - All Standard NEMA TS1 and TS2 timing functions
 - Maximum of 16 overlaps
 - Maximum of 12 pedestrian phases
 - Exclusive pedestrian operation
 - Soft recall
 - Phase re-service
 - Dynamic max operation
 - 64 coordinating patterns each with unique cycle, split, and offset
 - Three interconnect methods: Plan, TS2, Standard
 - Offset and split entries available in percent or seconds
 - Automatic permissive periods
 - Fixed or floating force-off
- Preemptor
 - Six linkable priority preemptors
 - Four bus preemption sequences with re-service control
 - Optional Transit Signal Priority (TSP) control
- Time-of-Day (TOD)
 - Separate control for NIC (non-interconnected coordination) and TOD (time of day) functions
 - 16 day programs
 - 10 week programs
 - Year program with 53 weeks
 - 36 holiday programs, fixed or floating
 - 200 NIC program steps
 - 100 TOD program steps
- Status Display
 - Keyboard selectable
 - Dynamic
 - Detailed
 - Types of displays available for all main controller functions including:
 - Controller
 - Coordinator
 - Preemptor
 - NIC/TOD
 - Detectors (local and system)
 - MMU
- Detectors
 - 64 vehicle detectors
 - 16 System or speed detectors
 - Individually assignable to phase and functions
 - Lock/non-lock function by detector or phase
- Logging Information
 - Separate buffers for:
 - Detector data

- Detector failures
 - Controller events
 - MMU events
 - Logged data
 - Viewed on front controller panel
 - Retrieved via RS-232 serial port
 - Transferred via telemetry
- Telemetry
 - Fully compatible with the traffic management system and protocol
 - Multiple serial port data rates from 1200 to 115 kbps
- Protocols
 - ECPIP
 - AB3418
 - AB3418+
 - NTCIP
- Configuration
 - Support for 170, TSI, TS2 Type 1 or 2 field I/O configurations
 - Automatic I/O configuration sensing
 - Fully mappable I/O functions

Controller Cabinet – Model 332A or B

- General
 - Material - Aluminum 0.125" thick
 - Finish
 - Natural unless otherwise requested.
 - If a cabinet will be powder coated, the color shall be the same color as the downtown Main Street Garage.
 - Dimensions – 66" H x 24" W x 30" D
 - Mounting - Base mounted
 - Bolt pattern 25" x 15"
 - (4) 3/4" x 16" anchor bolts (optional)
 - Access
 - Full size doors
 - Front and back
 - Ventilation
 - 100 CFM fan
 - Thermostatic control
 - Filtered air intake in front door
 - Lock Systems - 3 point with Corbin #2 lock
 - Handles – Stainless steel with padlock feature
 - Door Stops
 - 90° & 180° stop
 - Each door
 - Top and bottom
 - ±10°

- Rack assembly
 - Removable, Standard, 19" EIA rack
 - (1) Controller shelf
 - (2) 14 position input file
 - (1) 12 position output file
 - (4) heavy duty transfer relays
 - (1) Model PDA-2 combined power supply and Power distribution assembly or Model PDA-1 power distribution assembly and separate 24V DC power supply
 - (1) Lower input detector termination panel
 - (1) Service panel
 - (1) Police panel
 - with lights
 - On/off switch
 - Auto/flash switch
 - (1) Fan and thermostat assembly
- Weight of 300 lbs (without plug-ins or controller)
- Standard Features:
 - Model 332A or B
 - Meets all Caltrans and FHWA requirements
 - 8 phase, 4 ped operation
 - 2 right turn overlaps
 - 36 detector channel capability
 - Detector types include
 - Count
 - Calling
 - Extension
 - Delay
 - 3 Detectors per left turn
 - 6 Detectors per through movement
 - 2 or 4 channel detector modules can be used for:
 - Loop
 - Magnetometer
 - Magnetic
 - Detector input panel with:
 - Terminal blocks
 - Panduit ducts
 - 2 R/R preemption inputs with AC isolation
 - 4 emergency vehicle inputs
 - DC isolation inputs for:
 - Pedestrian push buttons
 - Special functions
 - DC isolation inputs for pedestrian push buttons and special functions
 - Programmable "yellow/red" or "all red" flash
 - Sufficient space for two 170 controllers

- 210 monitor slot
- 2 dual circuit flasher positions

Controller Cabinet – Model 336s

- General
 - Material - Aluminum 0.125" thick
 - Finish
 - Natural unless otherwise requested.
 - If a cabinet will be powder coated, the color shall be the same color as the downtown Main Street Garage.
 - Dimensions – 46" H x 24" W x 22" D
 - Mounting
 - Base mounted
 - Bolt pattern 25" x 15"
 - (4) 3/4" x 16" anchor bolts (optional)
 - Side of pole – 2 sturdy pole mounting brackets (optional)
 - Top of pole – slip fitter for post top mounting (optional)
 - Access
 - Full size doors
 - Front and back
 - Ventilation
 - 100 CFM fan
 - Thermostatic control
 - Filtered air intake in front door
 - Lock Systems - 3 point with Corbin #2 lock
 - Door Stops
 - 90° & 180° stop
 - Each door
 - Bottom
 - ±10°
 - Rack assembly
 - Removable, Standard, 19" EIA rack
 - (1) Controller shelf
 - (1) 14 position input file
 - (1) 12 position output file
 - (4) Heavy duty transfer relays
 - (1) Model PDA-2 combined power supply and Power distribution assembly or Model PDA-1 power distribution assembly and separate 24V DC power supply
 - (1) Service panel
 - (1) Police panel
 - with lights
 - On/off switch
 - Auto/flash switch
 - (1) Fan and thermostat assembly

- Weight of 280 lbs (without plug-ins or controller)
- Standard Features
 - Model 336s
 - Meets all Caltrans and FHWA requirements
 - 8 phase, 4 ped operation
 - 2 right turn overlaps
 - 16 detector channel capability
 - Detector types include
 - Count
 - Calling
 - Extension
 - Delay
 - 1 Detectors per left turn
 - 3 Detectors per through movement
 - 2 or 4 channel detector modules can be used for:
 - Loop
 - Magnetometer
 - Magnetic
 - 2 R/R preemption inputs (AC isolation)
 - 4 emergency vehicle inputs
 - DC isolation inputs for pedestrian push buttons and special functions
 - Combined or separate 24V DC power supply and power distribution assembly
 - Programmable “yellow/red” or “all red” flash through the use of flash plugs
 - 210 monitor slot
 - 2 dual circuit flasher positions
- Optional Features
 - Auxiliary output file provides 6 additional load switch positions for overlaps, etc.
 - Fluorescent cabinet light(s) with door switch
 - Dual fans
 - Auto/manual control with police panel cord
 - Detector and preempt test switch panel
 - Intersection display panel
 - Communications panels
 - External modems
 - Adapter base for M cabinet foundation
 - Pull-out drawer shelf assembly
 - Red monitoring kit
 - Cabinet diagnostic kit or prom
 - Special configurations available of request
 - Software to meet special requirements available on request

Pedestrian Push Button

- Vandal resistant
- Impact resistant
- Pressure activated
- No moving parts
- Aluminum powder coated button housing
- 316 Stainless steel button cap
- Solid state electronic Piezo switch rated for 100 million cycles with no moving plunger or electrical contacts
- LED indication on button to show activated status
- Two toned beep indication for activation (one tone for push, one tone for release)
- Built in surge protection
- Hold the call for a minimum of 5 seconds
- Not to allow ice to form to impede the function of the button or button cap
- All switch electronics are to be sealed within the housing.
- Total depth from face to back of terminal must be less than 1.75 inches.
- Raised ridges to protect from side impacts
- Use existing 2 wire inputs

Illuminated Street Name Sign

- **SIGN HOUSING**
 - UL 48 Listed Sign Assembly – Electric Sign
 - Sticker with manufactured name, date of manufacture, input voltage, and input amperage adhered next to the UL sticker – Required by UL
 - Continuously welded 5052-H32 aluminum sign housing assembly
 - Sign body is a box type enclosure with 0.25” drain holes, and separate hinged door assembly
 - All surfaces are powder coated – Interior is white and exterior is black
 - UL listed foam gasket installed, continuously, along sign body to prevent water from entering sign
 - Stainless steel hinge mounted the entire length of opening
 - Stainless steel hinge mounted the entire length of opening
 - Stainless steel latching assembly for sign door
 - All hardware must be stainless steel
- **SIGN FACE**
 - 0.125” Clear polycarbonate sign face that meets UL 48
 - 3M VIP Diamond Grade that is pressure rolled onto entire sign face
 - 3M EC Green Film pressure rolled over VIP Diamond Grade
 - 3M Double sided tape bonds sign face to door while open
- **ELECTRICAL**
 - All electrical wiring is solid copper wire - #18 AWG 600 volts at 103°C
 - UL listed Type 1, Outdoor, Class P Ballast with inherent thermal protection

- All wire connections made with compression wire nuts
- OVERHEAD SIGN DETAILS
 - Sign frame 5052-H32 aluminum .090
 - Twin high output fluorescent lamps
 - Continuous stainless steel hinge
 - Stainless steel latches
 - Sign panel .125 clear polycarbonate
 - Powder coat - Customer selected
 - Legend - Green 3M EC film over diamond grade VIP sheeting.
 - Mounting - PELCO Astro bracket, on-mast arm or under mast arm, as required
 - Photocell
 - Ballast – 120 Volts ac, 60 Hz.
 - Size
 - Sign
 - 20” high x 72” long x 6” deep
 - 1” border to provide an 18” view
 - Lettering
 - Street name - 8” EMOD/HLM, SHX
 - Suffix – 4”
 - Block Number – 3”
 - Weight – 62 lbs.

Mast Arms and Poles

- Reference FDOT standards
 - 17741
 - 17743
 - 17745
- Finish product must meet SSPC Paint Spec No. 36 QUFV-A Level 3 for weathering performance
- Color shall be according to Federal #27038 Semi Gloss Black Chip
- All hardware must be rigid mounted
- All hardware must be stainless steel

Cabinet-Mounted Interconnect Centers

- Suitable for rack or cabinet-mounting in equipment cabinets
- Compact dimensions suitable for in computer equipment rooms or remote equipment cabinets.
- Modular
- 12 fiber capacity dimensions 3.5x17x12 in
- 24 fiber capacity dimensions 1.75x127x12 in
- Rack or cabinet mount (19 inch or 23 inch frame)
- Available with pre-wired modules for splicing pigtails

- Terminates and/or splices cables
- 2-rack space mounting (larger, 24 fiber unit)
- Available features hinge location to swing out to left or right
- 12-fiber version accommodates up to two cables, 24 fiber version accommodates up to four cables
- 1-rack space mounting (smaller, 12 fiber unit)
- Optimized for low fiber counts when only front access is available.
- Flush 3.5 inch or standard 5.5 inch frontal projection.
- Hinged shelf allows easy accessibility of both connectors and splices.
- Selectable fiber core sizes and accessories