

ORIGINATION FORM

Date: **10-31-2013**

Originator: Jeff Morgan

Contact Information: Traffic Engineering and Operations, Traffic Systems Section
850-410-5600

Specification Title: **SIGNAL PRIORITY AND PREEMPTION SYSTEMS**

Specification Section, Article, or Subarticle Number: 663

Why does the existing language need to be changed? This is the initial introduction of a new section. Minimum requirements for signal priority and preemption systems are necessary to evaluate and approve these traffic control devices.

Summary of the changes: Establishing minimum requirements for priority and preemption systems.

Are these changes applicable to all Department jobs? If not, what are the restrictions? This requirement is applicable to projects including signal priority and preemption systems.

Will these changes result in an increase or decrease in project costs? If yes, what is the estimated change in costs? No increase or decrease in project costs is expected.

With who have you discussed these changes? In-house stakeholders (Traffic Engineering and Operations Office staff, Specifications Office staff).

What other offices will be impacted by these changes? Specifications and Estimates, Construction, Maintenance, and Roadway Design.

Are changes needed to the PPM, Design Standards, SDG, CPAM or other manual? No significant changes. Coordination of any minor changes to other documents (cross-references, etc.) is an ongoing effort of the Consolidation of Products and Specifications (COPS) working group in conjunction with the C-team.

Is a Design Bulletin, Construction Memo, or Estimates Bulletin needed? No.

Contact the State Specifications Office for assistance in completing this form.

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ANANTH PRASAD, P.E.
SECRETARY

MEMORANDUM

DATE: November 25, 2013

TO: Specification Review Distribution List

FROM: Daniel Scheer, P.E., State Specifications Engineer

SUBJECT: Proposed Specification: **6630000 Signal Priority and Preemption Systems.**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

This change was proposed by Jeff Morgan to establish minimum requirements for priority and preemption systems.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965DS, or daniel.scheer@dot.state.fl.us. Comments received after **December 23, 2013**, may not be considered. Your input is encouraged.

DS/cah
Attachment

SIGNAL PRIORITY AND PREEMPTION SYSTEMS.
(REV 11-256-13)

The following new Section is added after Section 660.

SECTION 663
SIGNAL PRIORITY AND PREEMPTION SYSTEMS

663-1 Description.

Furnish and install a signal priority and preemption system as shown in the plans. The system must activate traffic signal controller priority and preemption plans. The signal preemption system must recognize and respond to the priority of each user. Meet the requirements of Section 603.

663-2 Materials.

Use signal priority and preemption system equipment listed on the Department's Approved Product List (APL). Ensure that all materials furnished, assembled, fabricated or installed are new products.

Signal priority and preemption system equipment may utilize Optical, GPS, and Radio Frequency based technologies.

663-2.1 Functional Requirements: *Ensure that in-vehicle equipment operates without requiring any action from the vehicle operator or occupants once power is applied.*

663-2.1.1 Security: *The system must include features that secure the system and restrict its configuration and operation to authorized users and vehicles only.*

663-2.1.2 Vehicle Identification: *The system must be able to assign a unique identifier for each authorized vehicle. The system must be able to associate the identifier with vehicle information such as vehicle classification (e.g.: fire, police, rescue, transit), owner/operator, and priority level.*

663-2.1.3 Configuration and Management: *The system must allow authorized local and remote users to set and read all user-programmable features and retrieve data collected by the system. The manufacturer must provide computer software required to configure, operate, and maintain the system at no additional cost to the Department.*

663-2.1.4 Logging: *The system installed in the field cabinet must store a record of events, including time, vehicle ID, class, priority level, and approaching direction for all vehicles detected. The log must operate on a first-in, first out (FIFO) principle with a minimum capacity of 5000 events.*

663-2.1.5 Detection Range and Accuracy: *The priority and preemption system must be capable of detecting and identifying multiple authorized vehicles at various ranges up to 2500 Feet. The system must be able to determine the approaching direction of authorized vehicles. The detection range and programming of emergency (high priority) and transit signal (low priority) preemption shall be adjustable from within the traffic signal cabinet. High priority calls must override low priority calls.*

The system must service preemption calls having equal priority on a first come first served basis.

663-2.2 Preemption System Cabinet Electronics: *The priority and preemption system must be compatible with NEMA TS-1, NEMA TS-2, Type 170, and Type 2070 traffic signal controllers and their respective cabinets.*

The system must be able to provide calls to the controller via input file and detector rack. The system must include 2-channel or 4-channel detector card units compatible with NEMA TS 2-2003 v02.06. The system must include a shelf mount option.

The system must be able to provide emergency preemption (high priority) and transit signal (low priority) preemption calls to the controller. Detectors must include programmable timers that allow the operator to configure detector call extension as well as limit the length of channel output calls.

Channel outputs must deliver a constant signal while emergency vehicles are detected for high priority preemption activation. Channel outputs must deliver a pulsed output for low priority preemption activation. Inputs and outputs must be optically isolated.

663-2.2.1 Serial Interface: *Ensure that the serial ports support data rates up to 115 kbps; error detection procedures utilizing parity bits (i.e., none, even, and odd); and stop bits (1 or 2). Serial interface ports may utilize RJ-45 connectors, D-sub connectors, or screw terminals.*

663-2.2.2 Network Interface: *Ensure that local area network (LAN) connections support the requirements detailed in the IEEE 802.3 standard for 10/100 Ethernet connections. Ensure that the connector complies with applicable EIA and TIA requirements.*

663-2.3 Optical Preemption Detectors: *Optical preemption detectors must respond to light impulses generated from a visible or infrared light source.*

663-2.4 Intersection Radio/GPS Modules: *Radio/GPS preemption systems must include radio/GPS modules that transmit a beacon signal and receive data transmitted by Radio/GPS vehicle equipment.*

663-2.5 Mechanical Specifications: *Ensure equipment is permanently marked with manufacturer name or trademark, part number, and date of manufacture or serial number.*

Ensure that every conductive contact surface or pin is gold-plated or made of a noncorrosive, conductive metal. Do not use self-tapping screws on the exterior of the assembly.

All external parts must be made of corrosion-resistant materials, such as plastic, stainless steel, anodized aluminum, brass, or gold-plated metal.

Detector cards must include indicators for power and vehicle detection. Detector cards must include a test switch that can be used to manually generate detector calls that the system provides during normal operations.

663-2.6 Electrical Specifications: *Provide equipment that operates on a nominal voltage of 120 volts alternating current (V_{AC}). If the device requires operating voltages of less than 120 V_{AC} , supply the appropriate voltage converter.*

~~**663-2.7 Environmental Specifications:** *Ensure system electronics perform all required functions during and after being subjected to the environmental testing procedures described in NEMA TS2, Sections 2.2.7, 2.2.8, and 2.2.9. Detectors and detector connections that are exposed to the elements must be weatherproof and designed for outdoor use.*~~

663-3 Installation.

Installation of materials must be in accordance with the manufacturer's instructions. Install the emergency preemption system including installation of detectors with all necessary hardware and software, mounting hardware, cabling, and all other associated electronics in cabinet necessary to create a fully functional emergency preemption system.

Ensure that the priority and preemption system does not terminate an active pedestrian clearance interval.

Ensure that status indicators remain unobstructed and visible.

663-3.1 Field Testing: *Subject the system to field acceptance tests (FATs). Develop and submit a test plan for FATs to the Engineer for approval. The Engineer reserves the right to witness all FATs.*

663-4 Warranty.

Ensure that the manufacturer will furnish replacements for any part or equipment found to be defective during the warranty period at no cost to the Department or the maintaining agency within 10 calendar days of notification.

Ensure that the priority and preemption system has a manufacturer's warranty covering defects for five years.

663-5 Method of Measurement.

The Contract unit price for each signal priority and preemption system, furnished and installed, will include furnishing, placement, and testing of all equipment and materials, and for all tools, labor, hardware, operational software packages and firmware, supplies, support, personnel training, shop drawings, documentation, and incidentals necessary to complete the work.

663-6 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 663-1- Signal Priority and Preemption System