

**RESPONSE 2 Comments from Industry Review – 7840000**

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Bob Dion

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Comments:

784-4.1 mentions a one-year warranty, as all of the 780 series specifications do. Can this be written one time, such as is done for signals in Article 611-5? If not, include provisions for Warranty/Maintenance bond; see 611-5.1 in the spec book and/or 580-5 of the Supplemental Specifications, as examples for one.

**ITS SECTION RESPONSE:** Comment noted. Document changed so that the warranty section conforms to the Department’s basic contract requirements covering latent defects in installations and the need for bonding.

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Elizabeth McCrary

The comments below are submitted by the District Seven ITS section of Traffic Operations. Our ITS GC assisted with the review process. Thank you,

**784-2.2.1 – Device Server**

Why has a requirement for encryption been added to the Device Server (and not the rest of the network) - This will severely limit availability of different manufacturers given it must also meet TS2 specs.

**ITS SECTION RESPONSE:** Comment noted. Document not changed. The encryption requirement has been in the device server specification since the original draft from 2003 and manufacturers of this equipment have reviewed the document without taking exception. In addition, market research performed during the specification development process has found that there are multiple manufacturers advertising the functions required by this specification including extended operating temps. The specificatin originally called for 256-bit strong encryption, but that was modified in favor of a requirement that is more general in terms of implementation.

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Mark Burcham

- 1) For 784-1.2.5 Management Capability section, recommend inclusion to features that the MFES shall support Request for Coordination (RFC) 2974 Session Announcement Protocol (SAP) and RFC 2327 Session Description Protocol (SDP).

**ITS SECTION RESPONSE:** Comment noted. Document not changed. Subsection 784-1.2.5 states that the device must support multicast data transmission, which we presume is the basis of this request. We feel the current level of detail with regards to describing the hardware is adequate at this time.

- 2) For 784-2.2.2 Serial Interfaces section, recommend revision to minimum of four (at least two) serial data interface and connectors to support future growth.

**ITS SECTION RESPONSE:** Comment noted. Document not changed. It was our intent to have the minimum currently in the document in order to accommodate situations where no spare ports or additional future capacity is desired. The specification does not prohibit higher minimums to be noted in the plans for specific projects.

- 3) For 784-2.2.3 Network Interface section, suggest removal “or a 10/100 Base-FX connection” since MFES will most likely be located in same field cabinet or same room (TMC application) as the Device Server and the Ethernet output can be connected to the MFES. This will conserve fiber and reduce the cost of the device server.

**ITS SECTION RESPONSE:** Comment noted. Document not changed. There were District requests to include the optional fiber interface, when dictated by plans, for specific applications. The spec was broadened to accommodate this option at their request.

- 4) For 784-2.2.3 Network Interface section, recommend inclusion of RFC 2327 Session Description Protocol (SDP).

**ITS SECTION RESPONSE:** Comment noted. Document not changed. Additional requirements in other sections of the document define the general functionality that the device server must provide. We feel the current level of detail with regards to describing the hardware capabilities is adequate at this time.

- 5) For 784-2.2.3 Network Interface section, Tx <sup>1</sup>, etc is shown, but no references are included for superscript.

**ITS SECTION RESPONSE:** This notation was not in Subsection 784-2.2.3 of the Section 784 PDF that we checked. No superscript was intended there in the text. The superscripts in 784-3.2.9 indicate the two sets of optical ports.

- 6) For 784-3.2.9 Network Interface Specifications, suggest expansion of acceptable 100 Base-FX interface connection(s) to include SC, LC, and FC as indicated in MFES optical ports section 784-1.2.3.

**ITS SECTION RESPONSE:** Comment accepted and incorporated into the document.

- 7) For 784-3.3 Installation Requirements section, recommend revision to “shelf and/or rack-mountable” since it is typically one or the other.

**ITS SECTION RESPONSE:** Comment accepted and incorporated into the document.

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Steve Bowles, 678-947-6079, [sbowles@garrettcom.com](mailto:sbowles@garrettcom.com)

**784-1.2.2 Networking Standards:** Ensure that the MFES complies with the IEEE networking standards for Ethernet communications defined below, including the:

A.) **ADD:** 1000Mb Gigabit options for copper and/or fiber Gigabit (1000 Mbps) Ethernet: IEEE 802.3z (1000Base-X), 802.3ab (1000Base-T) and GBIC

**ITS SECTION RESPONSE:** Comment noted. Document not changed. Our position at this time is to make fast Ethernet (100 Mbps) the standard. Any Districts who desire more bandwidth for their projects would be able to specify gigabit Ethernet if they wish, but to require that across the board would create undue cost for projects where such capacity is not warranted.

**784-1.2.5 Management Capability:** Ensure that the MFES supports all Layer 2 management features and certain Layer 3 features related to multicast data transmission and routing.

A.) **ADD:** Secure web management interface using SSL and TLS. The **Secure Socket Layer (SSL)** is protocol that enables secure communications between a server or a browser. The **Transport Layer Security (TLS)** is a secure transmission protocol using data encryption and authentication.

B.) **ADD:** SNMP version 3 for higher degree of security. SNMPv3 provides encrypted authentication & access security and is per RFC 2271-75.

*There are three versions of SNMP defined: SNMP v1, SNMP v2 and SNMP v3. Both versions 1 and 2 have a number of features in common, but SNMPv2 offers enhancements, such as additional protocol operations. SNMP version 3 (SNMPv3) adds security and remote configuration capabilities to the previous versions. To solve the incompatible issues among different versions of SNMP, RFC 3584 defines the coexistence strategies.*

C.) **ADD:** Additional security features and software management functionality to include TACACS+, Radius Server, and LACP- Link Aggregation. TACACS and Radius for secure wireless and LACP for use to aggregate multiple wireless antenna inputs to an outbound Ethernet port to maximize bandwidth and throughput.

**TACACS- Terminal Access Controller Access Control System**

TACACS+ protocol provides access control for routers, network access servers and other networked computing devices via one or more

centralized servers. TACACS+ provides separate authentication, authorization and accounting services.

**Radius Server- Remote Authentication Dial In User Service**

Radius is a protocol for carrying authentication, authorization, and configuration information between a Network Access Server which desires to authenticate its links and a shared Authentication Server. RADIUS also carries accounting information between a Network Access Server and a shared Accounting Server. Radius uses UDP as the transport protocol.

**LACP- Link Aggregation**

The standard for this technology is IEEE 802.3ad. Link Aggregation, also called trunking or port trunking, is a technique of combining physical network links into a single logical link for increased bandwidth, achieving load balancing and increase fault tolerance. Link aggregation may be used to improve access to public networks by aggregating modem links or digital lines. Link aggregation may also be used in the enterprise network to build multigigabit backbone links between Gigabit Ethernet switches.

**ITS SECTION RESPONSE:** Comment noted. Document not changed. The goal of this specification is to describe general minimum functionality required. These specific mechanisms support those minimum functions and in some cases exceed them. We feel the current level of detail with regards to describing management capabilities of the hardware is adequate at this time.

**784-1.2.6 Mechanical Specifications:**

- A.) **ADD:** Modular switch for ease of field configuration and field servicing. Modularity ensures that the right port count will be achieved if the application mandates or necessitates the need for media converters or other than standard port configurations are needed. Additionally, modularity ensures that the switch can be easily upgraded over time to either Gigabit or other type of transport media. Any upgrades need to be done by the user and/or in the field.

**ITS SECTION RESPONSE:** Comment noted. Document not changed. There is a reference to field servicing and replacement in Subsection 784-1.3 that implies units must be designed in a manner that allows them to be quickly serviced or replaced in the field. Specific design characteristics that facilitate ease of service are often specific to a particular product. Requiring certain, specific modularity to achieve this function was deemed too restrictive.

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Mr. Bijan Behzadi, P.E., PTOE Phone #: 813-975-6733

Section 784-1.1: Consider deleting the word “proprietary” from the first paragraph.

**ITS SECTION RESPONSE:** Comment noted. The word “proprietary” does not appear in the first paragraph [Subsection 784-1.1]. It appears in 784-1.2.1 in reference to Layer 2 management intelligence of the devices. The line in question was reviewed and deemed to be an unnecessary explanation of why Layer 2+ capabilities are required. Generally, descriptive language for the sole purpose of explaining “why” something is required is not included in specifications. Therefore, this text has been removed.

Section 784-2.2.7: The term device server, which is also called “terminal server” in the industry, has been the source of confusion for managers, engineers, and contractors. Suggest adding a couple of sentences that define this term.

**ITS SECTION RESPONSE:** Comment accepted. Text added to further define the device server and indicate that it is also referred to as a terminal server.

Section 784-3.2.3: Consider adding the word “MPEG-4” after the word “MPEG-2.”

**ITS SECTION RESPONSE:** Comment noted. Document not changed. MPEG-4 is allowed and would be subject to compatibility with SunGuide, as stated in the paragraph that follows.

Section 784-3.2.5.1: Consider mentioning the format requirements for the decoder in this section.

**ITS SECTION RESPONSE:** Comment noted. Document not changed. The Specifications Office prefers that, whenever possible, we avoid repetition. Therefore, the format requirements for both the DVE and DVD were combined and presented in Subsection 784-3.2.3

Section 784-4: Consider standardizing warranty period for all devices.

**ITS SECTION RESPONSE:** Comment noted. Document changed to clarify warranty provisions in accordance with the requirements of the FDOT Construction Office. This editing was done in each specification’s warranty section to make the language consistent. However, because the warranty periods vary among the different ITS devices, a single paragraph covering all 16 products is not feasible.

Section 784-4.1: Please consider adding “maintaining agency” as another entity to whom the warranty should be transferable.

**ITS SECTION RESPONSE:** Comment noted. Document changed. The warranty section has been rewritten to conform to Department provisions as dictated by the Construction Office. The new language does not reference warranty transfers to a maintaining agency.

Training and technical support requirements should be included in the TSPs.

Requirements for system integration and configurations should be added to the TSPs.

**ITS SECTION RESPONSE:** Separate ITS Section specifications will contain the requirements for training and TMC testing. They will be made a part of the contract documents.

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Chung Tran, FHWA

784-1.1 - Should this be 1 Giabit?

**ITS SECTION RESPONSE:** Our position at this time is to make fast Ethernet (100 Mbps) the standard. Any Districts who desire more bandwidth for their projects would be able to specify gigabit Ethernet if they wish, but to require that across the board would create undue cost for projects where such capacity is not warranted.

784-1.2.1 (paragraph 4) - Is this a common standard or a number that is inherent in a certain switches?

**ITS SECTION RESPONSE:** The ten-year period is the common interval cited in most equipment literature.

784-1.2.4 - Should this be changed to the current 1 Gigabit speed now currently available.

**ITS SECTION RESPONSE:** Though gigabit Ethernet is certainly available, it is more capacity that most traffic networks require, with the exception of streaming video. Our position at this time is to make fast Ethernet (100 Mbps) the standard. Any Districts who desire more bandwidth for their projects would be able to specify gigabit Ethernet if they wish, but to require that across the board would create undue cost for projects where such capacity is not warranted.

784-2.2.1 (paragraph 4) - Do we need to define what it means to be sniffed? Should this be anoted as version 2 for now and the latest approved version on the market?

**ITS SECTION RESPONSE:** Document not changed. In the context of this sentence on security threats, the meaning of “sniffing” a data stream should be clear. As for citing standards, we prefer to give the version number rather than saying “latest version” because everyone then knows the exact criteria to meet. If a Version 3 comes out later, we will revise the text.

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Jim LaBatt, Blackhawk Industries, Ind.

**784-3.2.3 Format**

There are three parts to MPEG2, two of which are commonly adopted by ITS vendors. These two parts are 13818-2 Elementary Stream and 13818-1 Transport Stream. Most vendors doing business in Florida, as well as other states, have been required to provide full functionality at both 13818-2 and 13818-1 to provide interoperability with other vendors. Adherence to these two specifications all but guarantees interoperability, and most specifications recently written require adherence to both 13818-2 and 13818-1. I think you should include these specifications as a requirement, especially with regard to

**ITS SECTION RESPONSE:** Comment noted. Document not changed. We have chosen to reference 13818 in its entirety, implying conformance to the applicable

standards contained in parts 1, 2, etc. This serves the same purpose as listing parts 1 and 2 specifically.

784-3.2.6 Interoperability. This paragraph also includes reference that the department shall consider MPEG4 and H.264. This is a very broad statement, and one that needs to be reconsidered carefully. There are 19 profiles and many implementation variants per profile for MPEG4. Also, many of these profiles are low quality and not well suited for ITS. In addition to MPEG4's 19 profiles, H.264 (MPEG4 AVC) has 3 profiles with 16 variants each, creating an interoperability nightmare. For example, MPEG4 ASP (Simple profile) is very common today, with low resolution and low cost. While MPEG4 AVC (advance video codec) is a new industry standard. MPEG4 and H.264 are identical and are both recognized in the industry as providing a high quality, lower bandwidth solution. Additionally, there is no interoperability between MPEG2 and MPEG4 encoders and decoders today, but it is expected that H.264 (MPEG4 AVC) products will be backwards compatible with MPEG2. So, I think the wording should be carefully considered on what FDOT will consider. Also, the spec reads that department may require independent certification of compliance with these specifications. What specification is certification to be measured to: MPEG2 13818-2, MPEG2 13818-1, MPEG4 (which profile and variant)?

**SECTION RESPONSE:** Comment noted. Document not changed. There were District requests to include the option for consideration of alternate and emerging formats. MPEG2 is the standard at present and we expect most systems to utilize this format, hence the specification favors this technology. However, the document gives project engineers some flexibility in exercising their own professional judgment in order to consider use of alternate formats, should they be proposed or noted by plans for specific applications. The spec was broadened to accommodate this option at their request.

#### **784-3.2.5 Digital Video Decoder**

The specifications states "provide a hardware-based network device OR a software application". According to earlier portions of the specifications, both hardware and software decoding should be provided. I believe this sentence should read "AND" instead of "OR".

**SECTION RESPONSE:** Comment noted. Document not changed. The sentence is intended to define that a decoder may be a hardware device or a software program. The earlier reference to the software decoder was contained in the section for the DVE hardware. The intent is to require that any encoder be provided with a software decoder.

#### **784-3.2.5.2 Software-based Decoder**

I don't know how you qualify a software decoding program to be compatible with SunGuide software, as SunGuide is its own software package. Maybe the intent herein is to specify that the manufacturer shall provide an open API/SDK and SNMP MIBs for the product, so that it can be incorporated into SunGuide.

**SECTION RESPONSE:** Comment noted. Document changed. Language regarding availability of API/SDK has been included in the document for clarification. The intent of

requiring compatibility with SunGuide is to require that software operates on the same OS, namely Win2003 Server and WinXP clients. The FDOT Specifications Office rules restrict mentioning these operating systems by name. Further, the decoder software should in no way interfere with the operation of the SunGuide software, should it reside on the same hardware. The spec was revised for additional clarity on these points.

#### **784-3.2.6 Interoperability**

As mentioned above, I would recommend referencing 13818-2 (Elementary Stream) and 13818-1 (Transport Stream) in this portion of the specification.

**ITS SECTION RESPONSE:** Comment noted. Document not changed. We have chosen to reference 13818 in its entirety, implying conformance to the applicable standards contained in parts 1, 2, etc. This serves the same purpose as listing parts 1 and 2 specifically.

#### **784-3.2.7 Video Specifications**

The lower limit of 128kbps contradicts the MPEG2 specification. Many vendors cannot provide MPEG2 below 1Mbps. Others that allow you to set the bit rate at MPEG2 to any rate as low as 128bps (iMPath, for example), the video will be virtually useless at that bit rate. Since this is an MPEG2 specification, the lower limit on bandwidth really should be 1Mbps. For applications requiring bit rates <1Mbps (ie: wireless), then MPEG4 ASP (simple profile) should be considered for such applications. While the quality is less than that of MPEG2, it will provide a useable image at the lower bit rates.

**ITS SECTION RESPONSE:** Comment noted. Multiple vendors have advertised these capabilities. While the reality is that these settings will not likely be used for the reasons you describe, it was decided that the specification should reflect the advertised capability common in the market by at least a few manufacturers.

#### **784-3.2.8 Serial Interface**

This paragraph is technically fine, but could be enhanced to provide a better solution for the customer. First, the serial interfaces should be entirely independent from the video stream(s). These serial interfaces should act as true terminal services and be useable without regard to the status of the video stream. These serial interfaces should be accessible from any other device or port on the system, and not required to be one-to-one between DVE and DVD. (i.e., a computer opening a socket for a connection to a port). Second, you should specify that the serial interfaces are compatible and communicate with the device servers in section 784-2 of the specification. Third, you may consider the benefit of multicast data support offered by some vendors. This feature eliminates the needs for port sharing devices and makes a very clean solution.

**ITS SECTION RESPONSE:** Comment noted. Document not changed. The goal of this document is to describe general minimum functionality required. While complete independence of video and data and multicast functionality are desirable features, requiring these functions was deemed too restrictive at this time.

#### **784-3.2.9 Network Interface**

The second sentence says that a DVE can have one 100 Base-FX connection. The last sentence says that any DVEs with fiber connections must provide two optical ports. Appears to contradict itself.

**ITS SECTION RESPONSE:** Comment noted. Text changed to clarify fiber port requirements.

#### **784.3.2.10 Front Panel Status Indicators**

We don't understand the requirement for "link errors" and "transmission errors". Those are Ethernet functions which should be accommodated by the Ethernet switch, not the Video Encoder. Would recommend adding a "link status" LED which indicates connection to a network, as well as video status indicating video is connected to the encoder. However, the encoder doesn't know the status of the Ethernet transmission errors.

**ITS SECTION RESPONSE:** Comment accepted. Text was edited to state "link status" and "video transmission" indicators.

#### **784-3.4.2 Environmental Testing**

It is my understanding that these specifications are to be incorporated into project plans in the State of Florida. I would have to presume that the requirement to supply two units to TERL for environmental testing is a one-time certification process, and not a requirement for every project that bids in Florida.

**ITS SECTION RESPONSE:** Correct. Once a particular brand and model of device has been evaluated, it will be listed on the Approved Product List for ITS devices.

#### **784-4 Guaranty Provisions**

There is one theme within this section that is bothersome as a manufacturer, but I can't say that I have a solution. As the end-user, I understand the reasoning behind wanting a warranty for 'n' years from date of final acceptance. However, as a manufacturer, we therein assume a liability for a non-capable, non-performing Contractor. In a perfect world, a good Contractor will finish a 1 year contract in 1 year. Therefore, the manufacturer can cost a 3 year warranty for a DVE and meet the specification requirement for 2 year warranty from date of final acceptance. However, track history on Florida projects in recent years has shown that many Contractors are not finishing their projects on time. There are delays associated with hurricanes, contract disputes, and the inability of Contractors to do the work properly. These delays can last months to years. It seems unfair for manufacturers to burden the extra warranty time when they are not at fault for the delays. Maybe the warranty can start at the original scheduled date of completion.

**ITS SECTION RESPONSE:** Comment noted. These and other issues are being addressed in a rewrite of this section. With guidance from the FDOT Construction Office, the document is being changed so that the warranty section conforms to the Department's basic contract requirements concerning latent defects in installations and other provisions.