RFP Solicitation No. 3000000703
Advanced Traffic Management System (ATMS) Software Statewide
Addendum No. 1
Inquiries and Responses

---

1. Question: Will LADOTD ensure that the Streetwise vendor provides the necessary accessibility to Streetwise to allow the ATMS to interface with the ramp metering and TSS modules as required in the RFP?

   Response:

   It is the vendors' responsibility to work with the Streetwise vendor to provide the necessary accessibility to Streetwise to allow the ATMS to interface with the ramp metering and TSS modules as required in the RFP.

2. Question: Will LADOTD ensure that the CARS/511 vendor provides the necessary accessibility to CARS/511 to allow the ATMS to interface with the system as required in the RFP?

   Response:

   As per requirement, 3.1.17.2, the proposer shall be required to interface and share data to/from the CARS/511 system. Attached is an Interface Control Document (ICD) that outlines the interface requirements for both importing and exporting data into and out of CARS/511.

3. Question: Scope of Work Task 7 (p. 21 RFP): The results of the testing shall be subject to the DOTD's approval. Define successful testing.

   Response:

   The System Vendor will be required to submit a Test Plan that outlines all aspects of the system that will be tested along with expected results for each test. This Test Plan will be reviewed and approved by DOTD prior to the start of testing. Successful testing will occur when the desired results in the Test Plan are accomplished 100%.

4. Question: Scope of Work Task 7 (p. 21 RFP): If the system failures occur during the burn-in period, does the 60 day count stop? If so, does it restart at day 1 or at the day which the count stopped?

   Response:

   System Failures will be categorized as Catastrophic (rendering system totally unusable), Major (rendering most subsystems unusable), Minor (rendering a few subsystems unusable). If a Catastrophic Failure occurs, the day count will stop. If multiple Catastrophic Failures occur, DOTD reserves the right to restart the Burn-In period to day 1. If a Major Failure occurs, the day count will stop. If multiple (2 or more) Major Failures occur, DOTD reserves the right to restart the Burn-In period to day 1. If a Minor Failure occurs, the day count will stop only if the solution takes greater than 1 day to resolve, otherwise the day count will not stop. If multiple (greater than 3) Minor Failures occur in any one subsystem on a given day, the vendor will add one additional day to the Burn-In period for each occurrence.

5. Question: Sample Contract Attachment IV: Software License Agreement: Would the Department accept a vendor's standard software license as long as it meets the software-specific requirements of the provided Software License Agreement?

   Response:
   The Software License Agreement was provided as an example of what the State would find acceptable. However, in the event a vendor submits an alternative software license agreement the State would consider accepting that agreement provided the agreement is reviewed by a licensed attorney employed by the State of Louisiana and that any requested edits/revisions by the State are subsequently included in the agreement to insure conformity with State Law.

6. Question: Sample Contract Attachment IV: Software License Agreement: Please confirm that article 26 Warranties requires that Licensor warrant software for one (1) year.

   Response:
   This is a typographical error; it should be one (1) year.

7. Question: Attachment V: Price Proposal: Please provide the specific State Travel regulations that govern travel related expenses. The link provided in the RFP is invalid.

   Response:
   Travel expenses should comply with Louisiana Policy and Procedure Memorandum (PPM) 49. The guidelines can be found on the following website:

   http://www.doa.la.gov/osp/travel/travelpolicy.htm

8. Question: Please define whether existing CMS signs are dial-up, Ethernet, or other. If a mixture, please provide details as to how signs are connected through the communication backbone to the TMCs.

   Response:
   DOTD has the following connection options to DMS:

   - Dial-up – From analog modem installed on operator workstation using vendor software.
   - Cellular modem – Cell carrier has installed a static IP on the local modem in field. The DMS is accessed over Ethernet connection via internet through vendor software and/or current ATMS software.
   - Ethernet connection – DMS is directly connected to fiber in the field.

9. Question: Sections 5.0 and 7.2 of the Sample Contract refer to a budget of $1,500,000. However, Section 4.0 of the Strategic Business Plan represents a projected budget of $3,500.000 for this scope of work. As 25% of the proposal evaluation is based on the on pricing, was it the Department's intent to place a budget number in the Sample Contract?

   Response:

   Refer to Section 7.2 of the RFP, as it takes precedence over the other documentation cited in the above question.

10. Question: Section 3.2 of the High Level Functional Requirements Document refers to Performance Requirements, Incident Detection (Automatic), must meet a Performance Standard of , "Within 1 Minute:. This standard can only be met where technology is located in the field. Can you therefore define the type of technology used, detection spacing, and coverage area? Is it reasonable to assume that this requirement only applies to the areas that are, or will become instrumented?

    Response:

    LADOTD currently has detections, both radar and video, installed in several of our metropolitan areas. Most radar detection is spaced every ½ - 1 mile in the Baton Rouge, Shreveport and Houma metro areas with video detection installed at various locations throughout south Louisiana with no particular spacing. Yes, LADOTD, would only apply this requirement to areas where we have adequate instrumentation and/or external data sources that could be used for incident detection. We are hopeful that the proposed system may include some form of video analytics that could be used for automatic incident detection.

11. Question: Additionally, Section 3.2 of the High Level Functional Requirements Document refers to "Calculated Travel Times" with an associated Performance Standard of 98% accuracy". Will the Department propose a methodology to derive the baseline standard? If not, is it reasonable to assume a baseline methodology may be proposed by the successful respondent?

    Response:

    LADOTD will not propose a travel time methodology, it is expected that the vendor will submit a reasonable baseline methodology.

12. Question: Requirements 3.1.1.10 and 3.1.1.11 state that the ATMS shall be a web-based system. However, the Concept of Operations, Section 4.1.t states "Provide for a "lite" web-based version for use by DOTD staff when out of the facility as well as for use by approved external agencies. No other reference can be found in the legacy system engineering documents for this requirement. Will the department define why this requirement is important, and if reasonable alternative solutions are presented that will accomplish all of your objectives and more, will the Department consider relaxing this requirement.

Response:

It is LADOTD's desire to have a web-based system for ease of access and system administration. . Our experience with systems that require a client application to be installed on the workstation is that it complicates system support and makes system upgrades more man-power intensive. LADOTD may entertain a client-server application providing that the vendors' solution meets, at a minimum, the requirement in Section 3.1.2.6.

13. Question: Will the Department provide a deployment map or list existing ITS devices and proposed ITS devices?

Response:

LADOTD will provide a list of existing ITS devices, including the latitude and longitude for each device.

14. Question: Section 5 of the RFP, Proposal Content states the order in which the proposal will be prepared and maximum page limits as follows:

- Executive Summary (3 Pages)
- Corporate Background, Experience and Qualifications (8 Pages)
    - Veteran Owned and Service Connected Small Entrepreneurship
- Proposed Project Staff (10 Pages)
- Proposed Approach and Methodology (15 Pages)
- Project Schedule (2 Pages)
- Compliance Matrix
- Cost Information

However, the Evaluation Criteria assigns only 5 points to "Approach and Methodology" (15 Page response); 15 points to "Experience on Similar Project" (not referenced in the required proposal outline); 5 points to "Project Schedule" (2 Pages); 10 points to Staff Qualification (spread over two sections); 15 points to Compliance matrix etc... It appears that there is not a direct correlation between required proposal outline and the evaluation scoring criteria. Will the Department consider adjusting one, or the other?

Response:

The page amount stipulations are a "not to exceed" requirement and are not meant to be a direct correlation to the Evaluation Criteria assignments. LADOTD will not change the page requirements or the scoring criteria.

15. Question: Since cost is intended to be evaluated separately from the technical proposal, should cost be submitted with or separate from the technical proposal?

Response:

Each proposer must complete the RFP Attachment V, Price Proposal as provided in the RFP. **All price proposals shall be sealed and submitted separately from the Technical Proposal.**

16. Question: 15 points are assigned to "Compliance Matrix". How does the Department intend to assign these points? Based on the completion of the matrix, or the proportional number of areas the respondents state they are compliant?

Response:

DOTD has assigned a point value for each functional requirement, based on priority. DOTD has also assigned a point value for each category (Fully Comply, Comply with Modifications and Does Not Comply) response by the vendor. Below are the point values:

Priority Point Value

- DOTD Priority 1 = 3 Points
- DOTD Priority 2 = 2 Points
- DOTD Priority 3 = 1 Point

Vendor Response Point Value

- Fully comply = 2 Points
- Comply with modifications = 1 Point
- Does not comply = 0 Points

The vendors score for the Compliance Matrix is as follows:
((Requirement Priority Point Value) x (Vendors Response Point Value)) = X
The maximum point value = Y

Vendors score = (Sum of X) divided by Y, times 15 points equals the vendors score.

17. Question: The Proposal Format states that the response to the Veteran Owned and Service Connected Small Entrepreneurships...element be combined with the "Corporate Background, Experience, and Qualifications". Only eight pages are assigned to address both these areas. Will the Department consider breaking these sections out separately?

Response:

For reporting purposes please include Veteran Owned and Service Connected Small Entrepreneurships in your Corporate Background section of proposal. An additional page will be allowed for each business submitted under this requirement.

18. Question: The Concept of Operations document shows some high level communications architecture diagrams. Are there more detailed communication schematic diagrams that can

be provided?

Response:
LADOTD will provide a more detailed communication schematic in the addendum entitled "Statewide Current and Near Term Communications Plan Overview". Also, an updated version of Figure 3 in section 2.3.2 of the Concepts of Operations document is included in the addendum. The selected vendor will meet with LADOTD at the beginning of the project to fully discuss the communications system.

19. Question: Section 6.4.1 of the RFP. This section discusses evaluation factors associated with the Veteran-owned and Service – Connected Small Entrepreneurship. If you are a firm that is not certified as one of these enterprises, it seems like you can only be awarded significantly points if multiple entrepreneurships are included to your team. Will there be consideration to awarding more points if we award a significant portion of work to a single entrepreneurship rather than small pieces to many different ones?

Response:
See sections 5.2.1, 6.4, & 6.4.1 of the RFP.

10 points (10% of 100 points) of the scoring for this RFP is reserved for Veteran / Hudson Initiative (VHI) small entrepreneurship participation.

If the proposer is a VHI small entrepreneurship, 10 of the reserve points will be added to their proposal score. If the proposing firm is not a VHI small entrepreneurship but subcontracts with a VHI, for any amount of work, then a proration of the 10 points will be added to their proposal score as outlined in the RFP.

The Veteran or Hudson Initiative small entrepreneurship criteria do not designate a specific percentage of the total contract amount to be completed by a VHI subcontractor to receive reserve points.

20. Question: Is it expected that the bidder include the costs for all computer hardware and COTS software as part of our pricing?

Response:
The bidder is not required to include the costs for computer hardware but is required to include the cost of COTS software required to make the proposed system operational. The bidders Technical Proposal shall detail what hardware will be required for each ATMS installation location, as per Requirement 3.6.1.3, but will not include associated costs in their proposal.

21. Question: Within the TMC environments, do centralized video/media servers exist for the hosting, serving, and transcoding of video or is all video distributed directly from the field to

the operator desktops? If such video servers exist, can their make, model, and locations be identified?

Response:
Currently, LADOTD does not have any centralized video/media servers for hosting, serving, and transcoding video. All video is distributed directly from the field to the operator desktop to be decoded for display.

22. Question: Requirement 3.1.1.6.3. Please confirm that a software license is required for any transportation agency in the state, not just LADOTD?

Response:
It is expected that the software licenses will be for any transportation agency in the state including local, parish and state agencies.

23. Question: Requirements 3.1.3.1. Does this require us to integrate with the States' LDAP/Active Directory System?

Response:
The proposer will not be required to integrate with the States' LDAP/Active Directory System.

24. Question: Requirement 3.1.4.3.1.0.1.2. Is there an existing system in place which captures these snapshots, or will we be required to capture them?

Response:
There is not an existing system in that captures snapshot images, it is required that the proposer include this functionality.

25. Question: HAR – Does the state have a single existing HIS Platinum Server for control of HAR, or multiple servers?

Response:
LADOTD has a single HIS Platinum Server for control of HAR.

26. Question: DMS – Can confirmation be provided that all DMS signs are NTCIPv1 compliant? If not, can the specific protocols be provided?

Response:
All DMS in operation in Louisiana are NTCIPv1 compliant.

27. Question: To ensure system compatibility, can DOTD provide an interface control document (ICD) for the expected interactions with CARS/511?

Response:
Refer to the response for Question 2.

28. Question: To ensure system compatibility, can DOTD provide an interface control document (ICD) for the expected interactions with Streetwise?

Response:
Refer to the response for Question 1.

29. Question: What methodology will DOTD use to assign points for the Compliance Matrix portion of the proposal score?

Response:
Refer to the response for Question 16.

North American Hub FEU

Data Exchange Interface

Interface Control Document (ICD)

Prepared for:
North American Hub Receiving Centers

Last Revision:
September 7, 2008

Table of Contents

Revision History

Version	Author	Date	Change Notes
Draft 01	Kristin Virshbo	May 26, 2006	Initial draft version given to NYSTA
Draft 02	Derek Foster	June 7, 2006	This version of the document was created by manually merging the previous "CARS TMC Imports - Exports ICD - draft01.doc" document with the existing "CARS-FEU df005.doc" document. Extensive reformatting was performed, and numerous minor corrections to the text occurred. New diagrams for SOAP import were added. XML examples were added. Sections relating to durations were modified to indicate that duration is measured relative to the later of update time or start time. Sections relating to FIPS code were modified to indicate that a FIPS code with a state specified but a county of 000 is invalid.
Draft 03 (pd7)	Peter Davies	Sept 7, 2006	Draft version prepared for NYSTA. Highlights of the principal changes are as follows: 1. EventIndicator > “category” was added. CARS shall start sending this field (section 0). 2. Changes were made to how updates are handled after an event "ended" status is received. 3. In EventElementDetail, confidence should be sent as a numeric code rather than text. It is still OK to use text or number for other enumerated types, but priority and confidence shall always sent as numbers. 4. Note that, when inside Sender, we are adding one data element to each of the Organization Information and Contact Details data frames: organization-name and person-name. This makes the “Sender” and “Source” uses of these lower level data frames essentially the same.
Draft 04 (df8)	Derek Foster	Sept 12, 2006	Document was revised to incorporate specifics of the "recap request" feature. Updated WSDL was added incorporating this feature, and SOAP examples were added or revised to include this feature. The UTC "X" feature for handling time zones in recurrent times was previously noted as "not yet implemented in CARS 3". In fact, this feature has been implemented for over a year, so this text was removed. A few unrelated minor typographic errors were corrected in the document, but no other substantive changes were made.
Draft 05 (df9)	Derek Foster	Sept 12, 2006	Revised to remove the "source" attribute from recap request and recap response messages since it was not needed. Now, these always return all situations, not just situations from a specified sender.
Final 02 (df10)	Derek Foster	Sept 15, 2006	Minor corrections to the received XML messages in section**Error! Reference source not found.**. The example messages are now as received from an actual, working import server rather than merely being predicted results. Also added caveats about possible differences due to different use of namespaces and namespace prefixes.
Final 03	Derek Foster	Sept 22, 2006	Separated the SOAP portion of the document into its own section (section **Error! Reference source not found.**). Also, added a new section describing XML Direct. These are intended to be separately included in different versions of this document going to different customers. (To remove a section: delete it, then select the entire document (Ctrl-A), and perform "Update Fields" (F9) to renumber the other paragraphs as necessary and revise the table of contents. It might then be wise to perform a quick skim over the document looking for and removing any broken cross-references to the deleted section, such as those in this revision history section). Fixed a few broken cross references in the prior version of the document. Modified a few places in the document body where SOAP was specifically referenced, so that they now are either not specific as to whether SOAP or XML Direct are being used, or have been moved into the SOAP or XML

			Direct sections of the document. For instance, the "need for event recap section" (section **Error! Reference source not found.**) is now located in the SOAP portion of the document, since it is meaningless in the context of XML Direct.
Draft_1_09	Pd	1/9/2008	First draft for review with MEDOT
Draft_1_10	Pd	1/23/2008	Further changes to generalize the master document.
Draft_1_11	Pd	1/29/2008	Completed changes to sections 1, 2 and 3.
1_12	Pd	2/4/2008	Added Zack's feedback re. CARS-MATS.
1_13	Pd	8/21/2008	Edited by Peter prior to Google meeting
1_14-15	Pd	8/25/2008	Edited by Peter following Google meeting
1_16	Kv	9/5/2008	Further edited by Kristin following Google meeting.
1_17	KV	9/5/2008	Accepted track changes.
g S1_18	Kv	9/5/2008	Submitted to Google, IADOT.
G S1_19	Kv	9/5/2008	Changed namespace to www.northamericanhub.org

1. Concept of Operations

Public agencies use software such as the Condition Acquisition and Reporting System (CARS) as reporting tools for transportation-related event reports. CARS maintains a system-wide (state or regional) event database and supports the exchange of event information between itself and external systems.

The *North American Hub* Event Data Exchange Interface, the subject of this Interface Control Document (ICD), shall support the CARS-Hub software module in allowing event reports such as construction, road condition, and crash reports to be:

exported from each CARS agency's CARS application to the North American Hub.

imported from the North American Hub to each CARS agency's CARS application.

Third party users such as Google and non-CARS agencies who want to share event data can use this ICD to build similar applications to CARS-Hub that will receive data from or send data to the North American Hub.

The data exchanges defined here use CARS Group's Traffic Management Data Dictionary (TMDD)-based North American ITS standards to import and export traffic event reports. The CARS Group FEU implementation is referenced here as Version 2.2, as it includes some significant content accidentally omitted from the published FEU Version 2.1. The interface comprises a subset of the entire FEU message selected to support the requirements of this specific data exchange.

A key goal of this specification is to maintain compatibility between CARS modules and external systems such as Google and other third-party data recipients in a standards-compliant way. The intention is to adopt those parts of the standard that serves the needs of this particular data exchange. There is no intention of implementing those parts of the standards that are not yet required to support current or proposed data exchanges.

2. Relationships to other documents

The requirements in this ICD should be read in conjunction with the appropriate version of the following other documents, which also specify information necessary for successfully interfacing with the North American Hub:

2.1 FEU.xsd

This file contains the XML Schema for FEU data. All FEU XML data sent to or from the Hub must follow this schema.

The FEU.xsd schema contains more detail about the format of valid FEU XML than does this document. It specifies valid ranges for most numeric data, and the valid set of values for many enumerated data types.

Successful validation against the FEU.xsd schema is a necessary, but not sufficient, condition for event data *import* into CARS. Additional requirements are documented in the data frame definitions in the FEU Message Definition section below. Data which is sent *into* CARS must obey these constraints as well as being valid with respect to the FEU.xsd schema.

Data received *from* CARS deployments will follow the same constraints.

2.2 Master Phrase List

The North American Hub Master Phrase List defines the set of phrases, causes, advice and qualifiers that may be exchanged via the Hub. When the Hub is deployed, an XML list will published on the Hub, specifying all of these phrases.

3. Message Definition (FEU Version 2.2)

This section specifies the FEU data elements and data structures to be supported by the North American Hub.

FEU 2.2 material that is not included below will not be included in North American Hub data exchanges, either because it is rarely or never used, or because the information is used only internally by the agencies.

Although the FEU.xsd document specifies that enumerated values may be sent in XML as either textual names or as integers, the current North American Hub deployment will support only the textual form. Attempts to send integers as enumerated values may create an error condition.

The top-level data frame defines the overall structure of FEU messages, as follows:

```
FullEventUpdate::= SEQUENCE
{
    message-header          MessageHeader,
    event-reference         EventReference,
    event-indicators        SEQUENCE OF EventIndicator OPTIONAL,
    headline                EventHeadline,
    details                 SEQUENCE OF EventElementDetail OPTIONAL,
    operator-comments       EventComments OPTIONAL
}
```

This frame may contain the following data structures:

message-header	Initial information used at the start of a message
event-reference	A unique reference to the event
event-indicators	Optionally, indicators such as event status and event priority
headline	The key phrase (determines the event's icon or painted road color).
details	Details of each event element (its description, location, times, etc.).
operator-comments	Free text remarks, not for dissemination to the public.

Note that in North American Hub exchanges, event *details* are **required,** unless the purpose of this message is to indicate that the event has ended.

In North American Hub exchanges, it is expected that the headline phrase will be the first phrase from Event Element 1.

An example of XML for this frame is as follows:

```
<feu[1]:full-event-update xmlns:feu=" http://www.northamericanhub.org[2]">
  <message-header>
    <!-- Message Header goes here --!>
  </message-header>
  <event-reference>
    <!-- Event Reference goes here --!>
  </event-reference>
  <event-indicators>
    <!-- Event Indicators go here --!>
  </event-indicators>
  <headline>
    <!-- Headline goes here --!>
  </headline>
  <details>
    <detail>
      <!-- contents of each Detail go here --!>
    </detail>
  </details>
</feu:full-event-update>
```

3.1 Message Header

This data frame must be used at the start of every FEU message.

```
MessageHeader ::= SEQUENCE
{
   sender                  OrganizationInformation,
   message-type-version    Event-message-type-version,        --3803
   message-number          Event-message-number,              --3804
   message-time-stamp      DateTimeZone,
   message-expiry-time     DateTimeZone OPTIONAL
}
```

The frame shall contain the following data:

sender	The organization sending the message
message-type-version	The version of the message used in this exchange (always "1")
message-number	An effectively unique number referencing a specific message publication

[1] The "feu:" form of the top-level element is required because the current FEU.xsd schema uses the "elementFormDefault='unqualified'" feature of XML, indicating that the subelements of the full-event-update element need not (and must not) be qualified with a namespace, while the top-level element *must* be qualified.

[2]. This exact namespace must be used in FEU XML submitted to the Hub, or the Hub will not accept the incoming message.

message-time-stamp	The date and time of the message publication
message-expiry-time	Optionally, the date and time after which the message content is no longer valid. At this time, the sending system should stop sending the message. Also, the receiving system should delete the event from its active events database.

An example of XML for this frame is as follows:

```
<message-header>
    <sender>
      <organization-id>MEDOT</organization-id>
      <center-id>MEDOTCARS</center-id>
    </sender>
    <message-type-version>1</message-type-version>
    <message-number>103206</message-number>
    <message-time-stamp>
      <date>20080208</date>
      <time>095859</time>
      <utc-offset>-0400</utc-offset>
    </message-time-stamp>
</message-header>
```

3.1.1 Organization Information

This data frame must be used in the Message Header to reference the sender agency.

```
OrganizationInformation::= SEQUENCE
{
   organization-id          Organization-identifier,                --3343
   organization-name        Organization-name OPTIONAL,             --3344
   center-id                Organization-center-identifier          --3217
}
```

Note that "—3343" (etc.) are references to data element definitions in the TMDD Version 2 Data Dictionary.

The data frame contains the following data:

organization-id	Identifies the organization sending the message.
organization-name	Optionally, the name of the organization sending the message.
center-id	Identifies the system sending the message (e.g., MATS).

Note that *center-id* is optional in TMDD, but is mandatory in North American Hub data exchanges.

An example of the XML for this data frame is given later.

3.1.2 DateTimeZone

The ASN.1 definition for this data frame is as follows:

```
DateTimeZone ::= SEQUENCE
```

```
{
    date                    Time-local-date,                --3398
    time                    Time-local-time,                --3397
    utc-offset              Time-utc-offset                 --3376
}
```

This data frame contains the following data:

date	The local date, in the format "YYYYMMDD".
time	The local time, in the format "HHMMSS".
utc-offset	Defines the local time zone, in the format "+HHMM" or "-HHMM".

In Maine, for example, the UTC offsets are -0400 (summer) and -0500 (winter).[3] An event in Maine updated on September 15 shall have an update time UTC offset of -0400. If that event's end time is on November 1, 2008, the end time's UTC offset should be -0500.

An example of the XML for this data frame is given below:

```
<date>20080208</date>
<time>095859</time>
<utc-offset>-0400</utc-offset>
```

3.2 Event Reference

The ASN.1 definition for this frame is as follows:

```
EventReference ::= SEQUENCE
{
    event-id                Event-identifier,               --3215
    update                  Event-update                    --3293
}
```

This data frame comprises:

event-id	A unique identifier for this event and its updates.
update	The sequential number of the update being reported in this message.

The North American Hub requires *event-id* to be in the form "<sender>-<integer>", for example "MEDOT-4622".

[3] Note that the UTC offset of the message time stamp and the UTC offset defaults are determined by the local time in Augusta, even though the Maine CARS system is actually hosted in Portland, OR.

When the event report is first created, its initial *update* number is 1. The update number of an event (with a given *event-id*) shall be incremented with each *update*. If the update number reaches 65535, it shall not return to zero. Instead, the event must be ended, and a new event created with a new *event-id*.

An example of XML for this frame is as follows:

```
<event-reference>
  <event-id>MECARS-3206</event-id>
  <update>1</update>
</event-reference>
```

3.3 Event Indicator

The ASN.1 definition for this frame is as follows:

```
EventIndicator ::= CHOICE
{
   status                Event-incident-status,                --3313
   priority              Event-description-priority-level      --3301
}
```

Each instance of this frame contains one of the following data elements:

status	An enumerated value indicating the event's status. (See FEU.xsd for the valid values of this enumeration). Currently, it is used in North American Hub exchanges only to signify that an event has ended.
priority	The priority of the event (1 to 10, with 1 highest priority).

An example of XML for this frame (used twice) is as follows:

```
<event-indicators>
  <event-indicator>
      <status>ended</status>
  </event-indicator>
  <event-indicator>
      <priority>2</priority>
  </event-indicator>
</event-indicators>
```

3.4 Event Headline

The ASN.1 definition for this frame is as follows:

```
EventHeadline ::= SEQUENCE
{
   headline              EventType
}
```

The frame uses one other data frame, as follows:

headline	The key phrase within the event description.

An example of XML for this frame is as follows. Note that there are two uses of the word 'headline', one inside the other. Both are mandatory.

```
<headline>
  <headline>
    <pavement-condition>surface water hazard</pavement-condition>
  </headline>
</headline>
```

3.4.1 Event Type (Headline)

The ASN.1 definition for this frame is as follows:

```
EventType ::= CHOICE
{
    traffic-condition           Event-description-type-traffic-conditions,      --3817
    incident                    Event-description-type-incident,                --3818
    closure                     Event-description-type-closure,                 --3819
    roadwork                    Event-description-type-roadwork,                --3213
    obstruction                 Event-description-type-obstruction,             --3822
    delay                       Event-description-type-delay-status-cancellation, --3830
    unusual-driving             Event-description-type-unusual-driving,         --3831
    mobile-situation            Event-description-type-mobile-situation,        --3832
    device-status               Event-description-type-device-status,           --3833
    restriction                 Link-restriction-class,                         --3025
    disaster                    Event-description-type-disaster,                --3880
    disturbance                 Event-description-type-disturbances,            --3884
    sporting-event              Event-description-type-sporting-events,         --3886
    special-event               Event-description-type-special-event,           --3214
    parking-information         Event-description-type-parking-information,     --3835
    system-information          Event-description-type-system-information,      --3836
    weather-condition           Event-description-type-weather-condition,       --3299
    precipitation               Event-description-type-precipitation,           --3825
    wind                        Event-description-type-wind,                    --3826
    visibility-air-quality      Event-description-type-visibility-air-quality,  --3827
    temperature                 Event-description-type-temperature,             --3828
    pavement-condition          Event-description-type-pavement-condition,      --3298
    winter-driving-restriction  Event-description-type-winter-driving-restrictions, --3888
    winter-driving-index        Event-description-type-winter-driving-index     --3823
}
```

An example of XML for this data frame is as follows.

```
<pavement-condition>surface water hazard</pavement-condition>
```

3.5 Event Element Detail

This frame must be used at least once in all event reports except those with a status of *'ended'*: Its ASN.1 definition is:

```
EventElementDetail ::= SEQUENCE

{
   descriptions          SEQUENCE OF ElementDescription,
   locations             SEQUENCE OF EventLocation,
   times                 EventTimes,
   source                EventSource OPTIONAL
}
```

Simple events have only one element detail, while complex event descriptions are built up from multiple element details. For example, a roadwork causing delay typically has two elements: a roadwork element that lasts for weeks or months; and a delay element that lasts for minutes or hours.

This data frame may include the following data structures:

descriptions	What is happening in this event element.
locations	Where it is happening.
times	When it is expected to start and/or end.
source	Optionally, the original source of the event information.

With reference to the FEU.xsd for this data frame:

Where multi-element events are sent via the North American Hub, it will be assumed that the first element detail has an *element id* of 1, the second detail 2, etc.

All event reports exchanged via the North American Hub will be assumed to have an access level of 1 (public domain). Event reports that are not public domain should not currently be exchanged via the Hub.

An example of the XML for a two-element event is as follows:

```
<details>
  <detail>
    <descriptions>
      <!-- Descriptions go here --!>
    </descriptions>
    <locations>
      <!-- Locations go here  --!>
    </locations>
    <times>
      <!-- Times go here  --!>
    </times>
```

```
      <source>
        <!-- Source goes here --!>
      </source>
    </detail>
    <detail>
      <descriptions>
        <!-- Descriptions go here --!>
      </descriptions>
      <locations>
        <!-- Locations go here --!>
      </locations>
      <times>
        <!-- Times go here --!>
      </times>
      <source>
        <!-- Source goes here --!>
      </source>
    </detail>
  </details>
```

3.5.1 Element Description

The ASN.1 definition for this frame is as follows:

```
ElementDescription ::= CHOICE
{
    phrase              EventType,
    cause               EventType,
    advice              EventAdvice,
    qualifier           EventQualifier,
    quantity            EventQuantity,
    additional-text     AdditionalText
}
```

Each event-element detail contains a sequence of element descriptions. Each element description comprises **one** of the following data frames:

phrase	Part of the description of the event element. Each phrase conveys a specific component of an event, e.g. "Overturned truck."
cause	A phrase that is considered to be the reason (or part of the reason) for the event element, e.g. "due to fog"
advice	Further guidance added for safety or public information reasons, not meaningful if used alone; e.g. "Dense fog, *keep your distance*"
qualifier	Additional information that further qualifies the description, e.g. "Crash *in the left lane*"
quantity	A quantity that forms part of the event element..
additional-text	A free text comment added to an event description, for dissemination to the public.

At least one *phrase* (the headline phrase) must be present in each event report. At least this same phrase must be present in each event element detail.

3.5.2 Event Type (Phrase and Cause)

These two uses of event type (in *phrase* and *cause*) are exactly the same as that of *headline*, presented previously. Each instance shall contain one phrase or cause that constitutes part of the event description.

3.5.3 Advice

Each instance of this data frame shall contain one advice phrase that constitutes part of the event description. The ASN.1 definition for this frame is as follows:

```
EventAdvice ::= CHOICE
{
   suggestion              Event-description-advice-suggestion,              --3842
   warning                 Event-description-advice-warning,                 --3840
   recommendation          Event-description-advice-instruction-recommend,   --3843
   instruction             Event-description-advice-instruction-mandatory,   --3882
   alternative-route       Event-description-advice-alternate-route          --3814
}
```

An example of XML for this frame is as follows.

```
<descriptions>
  <!-- other descriptions may occur here --!>
  <description>
    <advice>
      <warning>repairs in progress</warning>
    </advice>
  </description>
  <!-- other descriptions may occur here --!>
</descriptions>
```

3.5.4 Qualifier

Each instance of this data frame shall contain one qualifier phrase that constitutes part of the event description. The ASN.1 definition for this frame is as follows:

```
EventQualifier ::= CHOICE
{
   generic-qualifier       Event-description-type-qualifier-generic,         --3847
   generic-location        Event-description-type-location-generic,          --3846
   lane-roadway            Event-description-type-lane-roadway,              --3844
   transit-mode            Event-description-type-transit-mode,              --3879
   vehicles-affected       Event-description-type-vehicle-group-affected,    --3887
   travelers-affected      Event-description-type-traveler-group-affected,   --3851
}
```

An example of XML for this frame is as follows.

```
<descriptions>
  <!-- other descriptions may occur here --!>
  <description>
    <qualifier>
      <travelers-affected>cars and light vehicles</travelers-affected>
    </qualifier>
  </description>
  <!--  other descriptions may occur here --!>
</descriptions>
```

3.5.5 Event Quantity

Each instance of this data frame shall contain one quantity that constitutes part of the event description. The ASN.1 definition for this frame is as follows:

```
EventQuantity ::= CHOICE
{
    extent                  DataExtent,
    link-state              DataLinkState,
    incident-details        DataIncidentDetails,
    road-weather            DataRoadWeather,
    parking                 DataParking,
    surface-conditions      DataSurfaceConditions,
    link-restrictions       DataLinkRestrictions
}
```

Table 1 summarizes the conversion rules applicable to the units that are used in FEU. To convert data from English units to FEU (quasi-metric) units, insert the value in English units into the 'English' variable of the conversion equation. The 'FEU' variable is the quantity as expressed in FEU. To convert data from FEU (quasi-metric) units to English units, insert the value into the 'FEU' variable of the conversion equation and the 'English' value will provide the quantity in English units. A check for the conversion is also provided.

TABLE 1 Conversion of Quantities between FEU and English Units

Quantity	TMDD / Metric Unit	English Unit	Conversion English to FEU	Conversion FEU to English	Conversion Check
Extent					
Length-affected	Tenth of a kilometer	Miles	FEU = ENG x 16.093	ENG = FEU / 16.093	1mi = 16.09344 1/10 of a km
Data Link State					
Delay	Seconds	Minutes	FEU = ENG x 60	ENG = FEU / 60	1 min = 60 sec
Headway	Seconds	Integer	FEU = ENG	ENG = FEU	-
Travel-time	Seconds	Integer	FEU = ENG	ENG = FEU	-
Data Incident Details					
Vehicles-involved	Vehicles	Integer	FEU = ENG	ENG = FEU	-
Cars-involved	Vehicles (cars)	Integer	FEU = ENG	ENG = FEU	-
Trucks-involved	Vehicles (trucks)	Integer	FEU = ENG	ENG = FEU	-
Buses-involved	Vehicles (buses)	Integer	FEU = ENG	ENG = FEU	-

Data Road Weather					
Wind-direction	Degrees	Degrees	FEU = ENG	ENG = FEU	-
Wind-speed	Tenths of m/s	MPH	FEU = ENG x 4.47039	ENG = FEU / 4.47039	1 MPH = 4.4704 1/10 of m/s
Air-temp	Tenths of deg Celsius	Deg. F	FEU = [(ENG-32] / 0.18	ENG = [(FEU x 0.18) + 32]	-40F = -400 1/10 of C 86F = 300 1/10 of C
Relative-humidity	Percent	Percent	FEU = ENG	ENG = FEU	-
Visibility	Tenths of meters	Feet	FEU = ENG x 3.048	ENG = FEU / 3.048	1 feet = 3.048 1/10 of meters
Data Parking					
Parking-spaces	Parking spaces	Spaces	FEU = ENG	ENG = FEU	-
Parking-occupancy	Percent	Vehicles	FEU = ENG	ENG = FEU	-
Data Surface Conditions					
Water-depth	Centimeter	Inches	FEU = ENG x 2.54	ENG = FEU / 2.54	1 inch = 2.54 cm
Adjacent-snow-depth	Centimeter	Inches	FEU = ENG x 2.54	ENG = FEU / 2.54	1 inch = 2.54 cm
Roadway-snow-depth	Centimeter	Inches	FEU = ENG x 2.54	ENG = FEU / 2.54	1 inch = 2.54 cm
Roadway-snow-pack-depth	Centimeter	Inches	FEU = ENG x 2.54	ENG = FEU / 2.54	1 inch = 2.54 cm
Ice-thickness	Millimeter	Inches	FEU = ENG x 25.4	ENG = FEU / 25.4	1 inch = 25.4 mm
Pavement-temperature	Tenths of deg Celsius	Deg F	FEU = [(ENG-32] * 5.5555	ENG = [(FEU x 0.18) + 32]	-40F = -400 1/10 of C 86F = 300 1/10 of C
Data Link Restrictions					
Speed-limit-advisory	km/h	MPH	FEU = ENG x 1.6093	ENG = FEU / 1.6093	1 MPH = 1.6093 km/h
Speed-limit	km/h	MPH	FEU = ENG x 1.6093	ENG = FEU / 1.6093	1 MPH = 1.6093 km/h
Speed-limit-truck	km/h	MPH	FEU = ENG x 1.6093	ENG = FEU / 1.6093	1 MPH = 1.6093 km/h
Restriction-length	Centimeters	Feet	FEU = ENG x 30.48	ENG = FEU / 30.48	1 ft = 30.48 cm
Restriction-height	Centimeters	Feet	FEU = ENG x 30.48	ENG = FEU / 30.48	1 ft = 30.48 cm
Restriction-width	Centimeters	Feet	FEU = ENG x 30.48	ENG = FEU / 30.48	1 ft = 30.48 cm
Restriction-weight-vehicle	Kilograms	Pounds	FEU = ENG x 0.4536	ENG = FEU / 0.4536	1 kg = 0.4536 lbs
Restriction-weight-axle	Kilograms	Pounds	FEU = ENG x 0.4536	ENG = FEU / 0.4536	1 kg = 0.4536 lbs
Restriction-axle-count	Axles	Axles	FEU = ENG	ENG = FEU	-

3.5.5.1 Extent

The ASN.1 definition for this frame is as follows:

```
DataExtent ::= CHOICE
{
    length-affected          Event-length-affected                    --3856
}
```

3.5.5.2 Data Link State

The ASN.1 definition for this frame is as follows:

```
DataLinkState ::= CHOICE
{
    delay                    Link-delay,                              --3005
    headway                  Link-headway,                            --3892
    travel-time              Link-travel-time                         --3038
}
```

3.5.5.3 Data Incident Details

The ASN.1 definition for this frame is as follows:

```
DataIncidentDetails ::= CHOICE
{
    vehicles-involved        Event-incident-vehicles-involved-count,  --3318
    cars-involved            Event-incident-cars-involved-count,      --3890
    trucks-involved          Event-incident-trucks-involved-count,    --3891
    buses-involved           Event-incident-buses-involved-count      --3889
}
```

3.5.5.4 Data Road Weather

The ASN.1 definition for this frame is as follows:

```
DataRoadWeather ::= CHOICE
{
   wind-direction            EssAvgWindDirection,                     --3910
   wind-speed                EssAvgWindSpeed,                         --3911
   air-temp                  EssAirTemperature,                       --3908
   relative-humidity         EssRelativeHumidity,                     --3922
   visibility                EssVisibility,                           --3932
}
```

3.5.5.5 Data Parking

The ASN.1 definition for this frame is as follows:

```
DataParking ::= CHOICE
{
    parking-spaces          Event-parking-number-of-spaces,     --3871
    parking-occupancy       Event-parking-occupancy             --3872
}
```

3.5.5.6 Data Surface Conditions

The ASN.1 definition for this frame is as follows:

```
DataSurfaceConditions ::= CHOICE
{
   water-depth              EssWaterDepth,                      --3934
   adjacent-snow-depth      EssAdjacentSnowDepth,               --3907
   roadway-snow-depth       EssRoadwaySnowDepth,                --3923
   roadway-snow-pack-depth  EssRoadwaySnowPackDepth,            --3924
   ice-thickness            EssIceThickness,                    --3913
   pavement-temperature     EssPavementTemperature              --3917
}
```

3.5.5.7 Data Link Restrictions

The ASN.1 definition for this frame is as follows:

```
DataLinkRestrictions ::= CHOICE
{
    speed-limit-advisory        Link-speed-limit-advisory,      --3863
    speed-limit                 Link-speed-limit,               --3034
    speed-limit-truck           Link-speed-limit-truck,         --3035
    restriction-length          Link-restriction-length,        --3027
    restriction-height          Link-restriction-height,        --3026
    restriction-width           Link-restriction-width,         --3029
    restriction-weight-vehicle  Link-restriction-weight-vehicle,--3028
    restriction-weight-axle     Link-restriction-weight-axle,   --3870
    restriction-axle-count      Link-restriction-axle-count     --3024
}
```

3.5.6 Additional Text

Each instance of this data frame shall contain one set of additional (web site) text that constitutes part of the event description on a specified medium. The ASN.1 definition is as follows:

```
AdditionalText ::= SEQUENCE
{
    description             Event-description,                  --3209
    language                Event-description-language OPTIONAL --3816
}
```

This frame contains the following data:

description	A free-form textual description of the event.
language	Optionally, the language in which the description is written. The default language is English.

An example of XML for web site additional text this data frame is as follows:

```
<descriptions>
  <description>
    <additional-text>
      <description> A 9' lane width will be in effect with two-day openings provided
every 30 days.</description>
    </additional-text>
  </description>
</descriptions>
```

3.5.7 Event Location

The ASN.1 definition for this frame is as follows:

```
EventLocation ::= CHOICE
{
   area-location          AreaLocation,
   location-on-link       LinkLocation
}
```

This data frame contains one of the following:

area-location	A named area such as a county.
location-on-link	An event's location on a transportation route (at a point, or along a defined stretch of a single designated route).

An example of XML for this frame is as follows:

```
<locations>
  <location>
  <!—area or location-on-link goes here --!>
  </location>
</locations>
```

3.5.7.1 Area Location

The ASN.1 definition for this frame is as follows:

```
AreaLocation ::= SEQUENCE
{
   area-id                Event-location-area-identifier                --3809
}
```

This data frame contains the following data element:

area-id	A Federal Information Processing Standards (FIPS) code identifying the area being referenced; or a dummy FIPS code known to the sending and receiving systems.

The FIPS code uses a 2-digit code to identify the state. Counties are referenced by following the 2-digit state code with a 3-digit county code. Cities are referenced by following the 2-digit state code with a 5-digit city code.

A statewide event can be indicated by simply using the 2-digit state code by itself. A county-wide event is indicated using the 2-digit state code followed by a 3-digit county code.

An example of XML for this frame is as follows:

```
<locations>
   <location>
     <area-location>
       <area-id>36021</area-id>
     </area-location>
   </location>
</locations>
```

3.5.7.2 Link Location

The ASN.1 definition for this frame is as follows:

```
LinkLocation ::= SEQUENCE
{
   link-ownership            Link-ownership,                                --3021
   route-designator          Link-route-designator,                         --3030
   primary-location          PointOnLink,
   secondary-location        PointOnLink OPTIONAL,
   link-direction            Link-direction,                                --3008
   link-alignment            Link-alignment OPTIONAL,                       --3391
   linear-reference-version  Link-location-linear-reference-version OPTIONAL --3854
}
```

This data frame may contain the following data:

link-ownership	The agency responsible for operating the roadway, e.g., MEDOT. A local or out-of-state road can be indicated by the value "Other".
route-designator	The official designator of the roadway, e.g., I-95; US 2; ME100. For local roads, the road name is given here, e.g., Main Street.
primary-location	One end of the event's location on the roadway.
secondary-location	For extent events, the other end of the event's location on the roadway.
link-direction	Optionally, the affected travel direction(s) along the roadway.

link-alignment	Optionally, the cardinal direction of positive-direction travel on a road, e.g., N, or E. This shall be included for events on both local and state roads.
linear-reference-version	Optionally, the version number of the distance referencing system (e.g., mile marker system) being used by the state or county.

Link direction may contain "positive direction", "negative direction", "both directions" or "not directional", relative to the direction of increasing mile points. The default value is "not directional." On local roads, *link-direction* relates to the positive direction specified in *link alignment*.

An example of XML for this frame and those defined next are as follows:

```
<location-on-link>
    <link-ownership>MEDOT</link-ownership>
  <route-designator>I-95</route-designator>
  <primary-location>
    <geo-location>
      <latitude>43000000</latitude>
      <longitude>-73000000</longitude>
    </geo-location>
   <linear-reference>121.378</linear-reference>
  </primary-location>
  <link-direction>not directional</link-direction>
</location-on-link>
```

3.5.7.2.1 Point on Link

The ASN.1 definition for this frame is as follows:

```
PointOnLink ::= SEQUENCE
{
    geo-location            GeoLocation,
    linear-reference        Link-location-linear-reference OPTIONAL,        --3855
    cross-street-name       SEQUENCE OF
                            Event-location-cross-street-begin-name OPTIONAL  --3229
}
```

This data frame may contain the following data:

geo-location	The latitude and longitude of the point.
linear-reference	Optionally, a distance marker reference to the point, on a roadway.
cross-street-name	For local roads, the name of a street intersecting with the designated local route, or any named point on the designated route.

On state routes, geo-locations and linear references can be expected. On local roads, geo-locations and cross-street names are typically provided.

3.5.7.2.1.1 Geolocation

The ASN.1 definition for this frame is as follows:

```
GeoLocation ::= SEQUENCE
{
   latitude                Event-location-coordinates-latitude,        --3226
   longitude               Event-location-coordinates-longitude        --3227
}
```

This frame contains the following data:

latitude	The latitude of a point, expressed as an integer in micro-degrees.
longitude	The longitude of a point, expressed as an integer in micro-degrees. Note that this value is negative in almost all of North America, indicating points west of the Prime Meridian.

An example of XML for this frame is as follows:

```
<geo-location>
  <latitude>45000000</latitude>
  <longitude>-120000000</longitude>
</geo-location>
```

3.5.8 Event Times

The ASN.1 definition for this frame is as follows:

```
EventTimes ::= SEQUENCE
{
   update-time             DateTimeZone,
   valid-period            ValidPeriod,
   start-time              DateTimeZone OPTIONAL,
   recurrent-times         SEQUENCE OF RecurrentTime OPTIONAL
}
```

This data frame may contain the following data:

update-time	The date/time/zone when the event element was validated, i.e. actually observed or calculated, or otherwise confirmed to be correct
valid-period	The time period during which the event element is valid
start-time	Optionally, the date/time/zone when an event element is expected to start, or is said to have started. Events without a start time are effective immediately, as of the *update-time.*
recurrent-times	Optionally, one or more time periods during which an event element may recur.

All times shall be expressed as local times at the primary location of the event. UTC offsets must be valid for the date and time specified in the event time. For example, in Maine, any message

time stamp that refers to the summer daylight savings period is required to have an offset of -0400 (Eastern Daylight Time).

An example of XML for this frame is as follows:

```
<times>
  <update-time>
    <date>20080625</date>
    <time>201225</time>
    <utc-offset>-0400</utc-offset>
  </update-time>
  <valid-period>
    <!-- The valid period goes here --!>
  </valid-period>
  <start-time>
    <date>20080625</date>
    <time>201222</time>
    <utc-offset>-0400</utc-offset>
  </start-time>
  <recurrent-times>
    <!-- The recurrent times go here --!>
  </recurrent-times>
</times>
```

3.5.8.1 Valid Period

The ASN.1 definition for this frame is as follows:

```
ValidPeriod ::= CHOICE
{
   end-time                DateTimeZone,
   duration                Event-timeline-estimated-duration        --3279
}
```

This data frame must contain one of the following data structures:

end-time — The date/time/zone when the event element is expected to end. At this time, the element detail will be considered to have ended. The event element shall be deleted or archived, unless the valid period is updated before that time/date.

duration — The expected duration of the event element, measured in minutes starting from the update-time (or the *start-time*, if it is specified and is later than the *update-time*). After this period the event element shall be deleted or archived, unless the valid period is updated before the duration has expired (TMDD 3279).

If an event's duration crosses over a change to or from daylight saving time, the duration will retain its specified time interval. For example, an event occurs in a state with daylight saving time at midnight on 10/30/2008, having a duration of four hours, will end four hours later, at 3 AM on 10/31/2008—not at 4 AM, as would be the case on any other night.

An example of XML for the 'end time' choice is as follows:

```
<valid-period>
  <end-time>
    <date>20080624</date>
    <time>201222</time>
    <utc-offset>-0400</utc-offset>
  </end-time>
</valid-period>
```

An example of XML for the 'duration' choice is as follows. Note that the duration is specified in minutes:

```
<valid-period>
  <duration>30</duration>
</valid-period>
```

3.5.8.2 Recurrent Time

The ASN.1 definition for this frame is as follows:

```
RecurrentTime ::= SEQUENCE
{
        recurrent-period        EventPeriod,
        schedule-times          SEQUENCE OF
                                Event-timeline-schedule-times OPTIONAL,  --3280
        utc-offset              Time-utc-offset OPTIONAL                 --3376
}
```

This data frame may contain the following data:

recurrent-period	One or more named periods within which the event is in effect, e.g. Sundays.
schedule-times	Optionally, a sequence of times during which the event is in effect.
utc-offset	Optionally, the offset of the scheduled times from Coordinated Universal Time.

This data frame is used to describe a series of recurring time periods during which an event is active, For instance, an event might be active on Mondays and Wednesdays from 2:00pm to 3:00pm, and Fridays from 5:00pm to 7:00pm.

As for all event times, *recurrent times* are expressed in local time for the event's primary location. When daylight saving time begins or ends, *recurrent times* expressed in local time remain unchanged.

An example of XML for this frame is as follows:

```
<recurrent-time>
  <recurrent-period>
    <days-of-the-week>
      <day-of-the-week>Monday</day-of-the-week>
      <day-of-the-week>Tuesday</day-of-the-week>
    </days-of-the-week>
  </recurrent-period>
```

```
    <schedule-times>
      <schedule-time>01300515</schedule-time>
      <schedule-time>09301615</schedule-time>
    </schedule-times>
    <utc-offset>-0600</utc-offset>
  </recurrent-time>
```

3.5.8.2.1 Event Period

Optionally, this frame can be used one or more times to describe the days of the week upon which an event is in effect. For instance, it could contain Mondays, Wednesdays, and Fridays.

The ASN.1 definition for this frame is as follows:

```
EventPeriod ::= SEQUENCE
{
   days-of-the-week     SEQUENCE OF Event-timeline-schedule-days-of-the-week,
                                                                        --3282
}
```

This frame contains the following data:

days-of-the-week	One or more days of the week to which the event applies. (See FEU.xsd for the valid values of this enumeration.)

3.5.9 Event Lane

This data frame allows users to indicate lane effects in one or both directions, on various types of lanes. If desired, it is also possible to say how many lanes are affected *without* specifying which ones.

The ASN.1 definition for this frame is as follows:

```
EventLane ::= SEQUENCE
{
   lanes-type              Event-lanes-type DEFAULT 1,                 --3382
   link-direction          Link-direction OPTIONAL,                    --3008
   lanes-total-original    Event-lanes-total-lanes OPTIONAL,           --3221
   lanes-total-affected    Event-lanes-total-affected OPTIONAL,        --3383
   event-lanes-affected    SEQUENCE OF Event-lanes-affected OPTIONAL   --3219
}
```

This frame may contain the following data:

lanes-type	Optionally, the type of lanes that are described by this element. (See below for the valid values of this enumeration)
link-direction	Optionally, the direction of travel of the affected lanes.

lanes-total-original	Optionally, the original number of lanes available in this direction and of this type, prior to this event.
lanes-total-affected	Optionally, the number of these lanes affected by this event.
event-lanes-affected	Optionally, one or more specific lanes affected by this event.

Initially, only one value of *lanes-type* will be supported in North American Hub exchanges: "through lanes". This is the default value ("1").

In the future, three or more values of *lanes-type* may be supported. Currently, the most likely deployment would be: "left lanes", "through lanes", and "right lanes".

Each element of the *event-lanes-affected* sequence is either a "1" (indicating that the lane is affected by this event) or a "0" (indicating that it is not affected). Lanes are referenced from right to left.

If *lanes-total-original* is specified along with *event-lanes-affected*, the *event-lanes-affected* sequence must have the same number of elements in it as is specified in *lanes-total-original*. Also, if *lanes-total-affected* is also specified, then this sequence must have the same number of "1" entries as is specified in *lanes-total-affected*.

An example of XML for this frame is as follows:

```
<lanes>
  <lane>
    <lanes-type>through lanes</lanes-type>
    <lanes-total-original>5</lanes-total-original>
    <lanes-total-affected>3</lanes-total-affected>
    <event-lanes-affected>
      <event-lanes-affected-item>1</event-lanes-affected-item>
      <event-lanes-affected-item>1</event-lanes-affected-item>
      <event-lanes-affected-item>1</event-lanes-affected-item>
      <event-lanes-affected-item>0</event-lanes-affected-item>
      <event-lanes-affected-item>0</event-lanes-affected-item>
    </event-lanes-affected>
  </lane>
</lanes>
```

4. XML Direct Interface

4.1 Overview

When carried out using XML Direct, data transferred between the Hub and sending/receiving centers will use a web server to publish documents that represent the current state of relevant traffic events, using the HTTP protocol (Hypertext Transport Protocol, which is the protocol normally used to communicate between web servers and web browsers). The message payloads will consist of Extensible Markup Language (XML)-formatted messages.

Note that the XML Direct interface can be used either to publish data from the Hub so that external clients may access it; or to provide a mechanism for inserting data into the Hub.

4.2 Output Interface

To provide data to external systems using XML Direct interface, the Hub will be set up to periodically publish its data to a specific file (one per data type per agency) that is accessible by a web server. As part of this configuration, a time interval will be specified to determine how frequently this output file will be overwritten with new data—typically, every 30-60 seconds.

The Hub will publish the contents of each file so that it is accessible via a specified Uniform Resource Locator (URL). This publishing is performed in a similar fashion to the way that ordinary web pages (written in HTML—Hypertext Markup Language) are deployed. However, in this case, the contents of the document being published are not an HTML page, but an XML document instead.

Receiving systems shall use an HTTP 'GET' command (as opposed to a "POST" command) to the designated URL shall be used to retrieve the contents of the XML document, which will be in the following format:

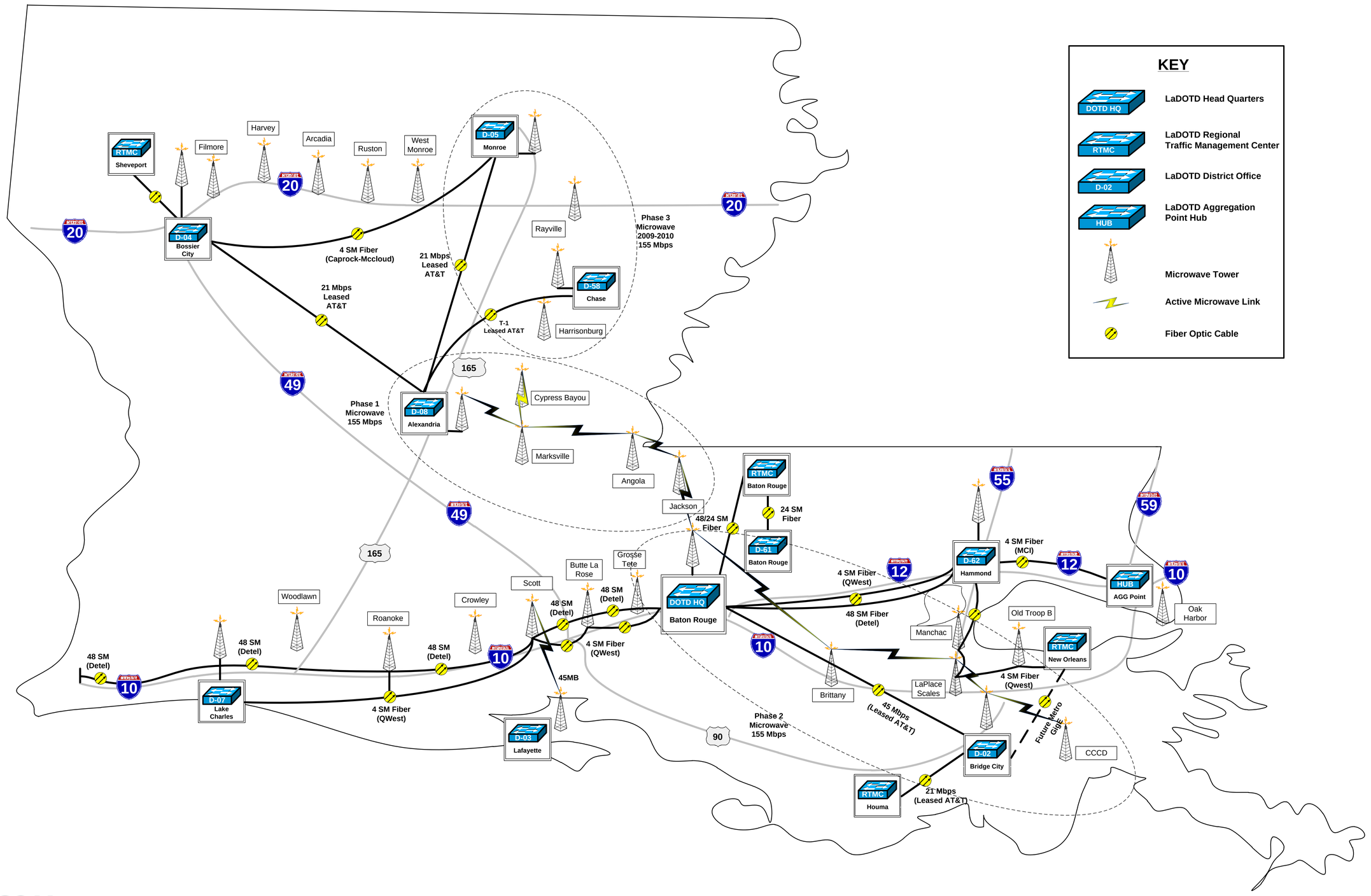
```
<FEUMessages>
  <full-event-update xmlns='http://www.northamericanhub.org'>
    <!-- body of first full-event-update message goes here -->
  </ full-event-update>
  <full-event-update xmlns='http://www.northamericanhub.org'>
    <!-- body of second full-event-update message goes here -->
  </ full-event-update>
</FEUMessages>
```

Note that spaces and newlines were inserted in the above example for readability. The actual document contains no whitespace between adjacent XML elements.

Systems that publish data for the Hub to retrieve may follow the same model, but in reverse.

4.3 Authorization, Authentication, and Encryption

The Hub shall require a unique username/password from the client as part of an attempt to download XML documents from the web server. IP "whitelisting" shall not be used as a means of authentication or restricting access.



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STATEWIDE CURRENT AND NEAR TERM COMMUNICATIONS PLAN OVERVIEW

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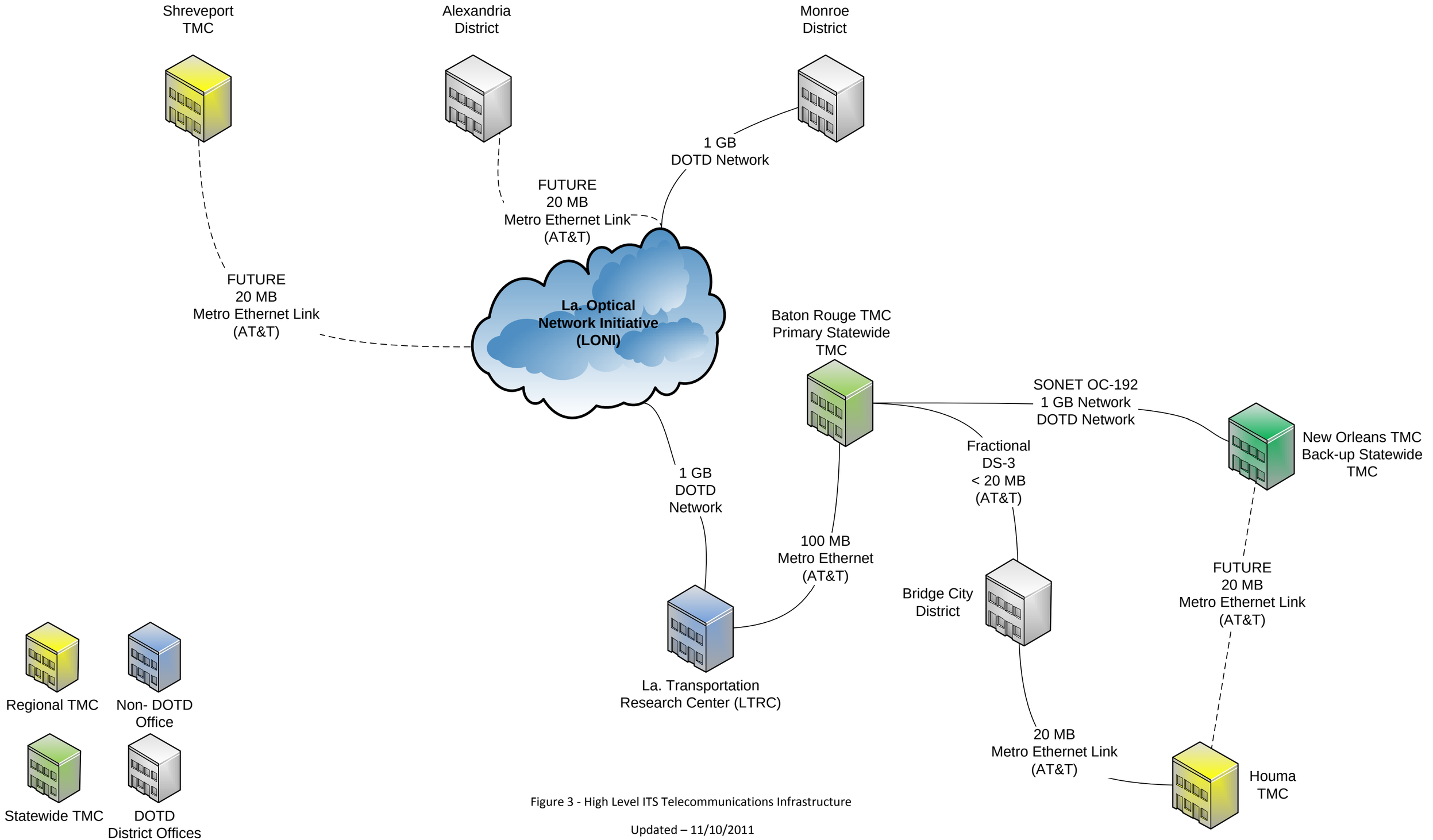

Figure 3 - High Level ITS Telecommunications Infrastructure

Updated – 11/10/2011