

**REVISED
MAY 1, 2012**

**DELAWARE DEPARTMENT OF TRANSPORTATION
REQUEST FOR PROPOSALS**



**Delaware Department
of Transportation**

CONTRACT No: 1599- READVERTISED

**511 TRAVELER
INFORMATION SYSTEM**

DELAWARE DEPARTMENT OF TRANSPORTATION

PROPOSAL DUE DATE/TIME: Tuesday, ~~May 8~~ May 22, 2012 - 2:00 P.M.

Request for Proposals are to be delivered to Contract Administration, Delaware Department of Transportation, 800 Bay Road, Dover, Delaware 19903 by **2:00 p.m.** (Local time) on proposal due date shown above.

Original Issue: February 1, 2012

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REQUEST FOR PROPOSALS

511 Traveler Information System

1. OVERVIEW AND AUTHORITY

1.1 Purpose

This Request for Proposal (RFP) is issued by the Delaware Department of Transportation (hereinafter designated as 'Department') for the purpose of acquiring Technical proposals from prospective bidders to provide a statewide travel information service which provides quality, timely, reliable and relevant traffic, weather, and multi-modal information to users via web and 511 telephone.

1.2 Intent

The intent of this Request for Proposals (RFP) is to solicit responses for the 511 Traveler Information System. The Federal Communication Commission (FCC) established 511 as the universal dialing code throughout the nation to allow citizens to access highway, multi-modal, and other pertinent travel information via landline or wireless telephones.

This intent will be served by selection of one Vendor to perform the requested services. The contract for this project will expire upon successful completion of the three year System Maintenance Support period by the contractor.

1.3 Scope

This document contains general information relating to the procedural requirements in the preparation of proposals to the Department performance requirements and vendor characteristics which must be met in order for a proposal to receive consideration. This document should not be considered an all-inclusive list of vendor responsibilities, existing functionalities, stakeholders, and requirements. The Vendors shall be responsible for any liability or cost incurred in connection with responding to this request for proposal. All Vendors shall fully bear the costs associated with pre-contract activities including but not limited to proposal preparation, negotiations, and/or proposed contracts.

1.4 Authority

This Request for Proposals is issued pursuant to 29 Del. C. §§6981 and 6982.

1.5 Inquiries

All requests, questions, or other communications about this RFP shall be made in writing. Address all communications to the person listed below; communications made to other State of Delaware personnel or attempting to ask questions by phone or in person will not be allowed or recognized as valid and may disqualify the vendor. The

Vendors should rely only on written statements issued by the RFP designated contact.

All inquiries concerning this RFP should be emailed and must be submitted to:

Wendy B. Henry, Contract Administration
Delaware Department of Transportation
wendy.henry@state.de.us

To ensure that written requests are received and answered in a timely manner, electronic mail (e-mail) correspondence is acceptable, but other forms of delivery, such as postal and courier services can also be used.

All questions will be consolidated into a single set of responses and posted as an addendum on the State's website at www.bids.delaware.gov. Vendors' names will be removed from questions in the responses released. Questions should be submitted in the following format.

- Section number
- Paragraph number
- Page number
- Text of passage being questioned
- Question

1.6 Confidentiality and Integrity of Data

The Department is responsible for safeguarding the confidentiality and integrity of data in State computer files regardless of the source of those data or medium on which they are stored; e.g., electronic data, computer output microfilm (COM), tape, or disk. Computer programs developed to process State Agency data will not be modified without the knowledge and written authorization of the Department. All data generated from the original source data, shall be the property of the State of Delaware. The control of the disclosure of those data shall be retained by the State of Delaware and the Department.

Submission of a response to this Request for Proposal (RFP) indicates the Vendor understands its employees, individually, may be required to sign a CONFIDENTIALITY AND INTEGRITY OF DATA STATEMENT prior to beginning any work.

Any and all Department information, knowledge, or data accessed by the Vendor, or provided to the Vendor by the Department is confidential and the property of the State

of Delaware. The Vendor will not directly or indirectly disclose or use it for purposes unrelated to the agreement at any time without first obtaining the written consent of the Department, unless the information, knowledge, or data is generally available to the public.

1.7 Security

Computer, network, and information security is of paramount concern for the State of Delaware and the Department of Technology and Information. The State wants to ensure that computer/network hardware and software does not compromise the security of the State's Information Technology (IT) infrastructure. The SANS Institute and the FBI have released a document describing the Top 20 Internet Security Threats. The document is available at www.sans.org/top20.htm for your review. The Vendor must guarantee that any systems or software provided by the Vendor is free of the vulnerabilities listed in that document.

1.8 Cyber Security Liability

It shall be the duty of the Vendor to assure that all products of its effort do not cause, directly or indirectly, any unauthorized acquisition of data that compromises the security, confidentiality, or integrity of information maintained by the State of Delaware. Vendor's agreement shall not limit or modify liability for information security breaches. In addition to all rights and remedies available to it in law or in equity, the State shall subtract from any payment made to Vendor all damages, costs and expenses caused by such information security breaches that have not been previously paid to Vendor.

1.9 Compliance with the Law

It is the responsibility of the Vendor to give all notices and to obtain all permits and licenses, and to remit all taxes as required to perform work in the State of Delaware.

The Vendor must comply with all federal, state, and municipal legislation which may have application to any future work or performance of a contract.

The Vendor must comply with all state and federal legislation affecting conditions of work and wage rates including any Delaware Employment Standards Act and/or Workers Compensation Act or any other laws that impose obligations in the nature of employers' obligations.

1.10 Right to Amend

The Department reserves the right to amend or supplement this RFP, giving equal information and cooperation by way of an issued addendum to all Vendors as a result of any such amendment.

1.11 Liability for Errors

While the Department has used considerable efforts to ensure an accurate representation of information in this RFP, the information contained in the RFP is supplied solely as a guideline for Vendors.

The information is not guaranteed or warranted to be accurate by the Department nor is it necessarily comprehensive or exhaustive.

Vendors acknowledge and understand that it is their responsibility to obtain clarifications concerning this RFP through the Questions and Answers process prior to the date listed in Section 1.14, and that failure to understand the terms of the RFP will not be considered a valid reason for any resulting non-compliant rating.

1.12 Use of the RFP

The RFP document or any portion thereof, may not be reproduced or used for any purpose other than the preparation of proposal submissions by the Vendor.

1.13 Vendor's Expenses

Vendors are solely responsible for any expenses they incur in preparing, delivering or presenting a response to this RFP, and for subsequent negotiations with the Department, if any.

1.14 Anticipated RFP Action Dates

| Action Item | Date |
|--------------------------------|--|
| RFP Advertisement | April 12, 2012 |
| Final Date to Submit Questions | April 26 May 10, 2012 |
| RFP Submission Due | May 8 May 22, 2012 by 2:00 pm* |
| Anticipated Award | July 31 August 14, 2012 |

*NOTE- Vendors may be asked to participate in Product Demonstrations.

1.15 Terms and Conditions

Submission of a proposal in response to this RFP indicates acceptance of all of the terms and conditions contained herein.

- The proposal submitted by the selected Vendor will become a part of the contract. The proposal must be valid for a minimum of one-hundred-twenty (120) days from the RFP due date.

- By submitting a proposal, the proposing Vendor agrees that in the event it is awarded a contract, it will indemnify and otherwise hold harmless the State of Delaware, its agents and any employees from any and all liability, suits, actions, or claims, together with all costs, expenses for attorney's fees, arising out of the Vendor's, its agents' and employees' performance of work or services in connection with the contract, regardless of whether such suits, actions, claims, or liabilities are based upon acts or failures to act attributable, in whole or in part, to the State, its employees or agents.
- The selected vendor will be required to enter into a written agreement with the State of Delaware. The State of Delaware reserves the right to incorporate standard State contractual provisions into any contract negotiated as a result of a proposal submitted in response to this RFP. Any proposed modifications to the terms and conditions of the standard contract are subject to review and approval by the State of Delaware. Vendors will be required to sign the contract for all services, and may be required to sign additional agreements.
- The selected vendor or vendors will be expected to enter negotiations with the State of Delaware, which will result in a formal contract between parties. Procurement will be in accordance with subsequent contracted agreement. This RFP and the selected vendor's response to this RFP will be incorporated as part of any formal contract.
- The successful firm is not to begin any service prior to receipt of a Notice To Proceed (NTP) from the Department's Contract Administration Section. The proposals submitted by the successful firm become a part of the contract
- If the vendor to whom the award is made fails to enter into the agreement as herein provided, the award will be annulled, and an award may be made to another vendor. Such vendor shall fulfill every stipulation embraced herein as if they were the party to whom the first award was made.
- **Insurance-** The Vendor recognizes that it is operating as an independent contractor and that it is liable for any and all losses, penalties, damages, expenses, attorney's fees, judgments, and/or settlements incurred by reason of injury to or death of any and all persons, or injury to any and all property, of any nature, arising out of the vendor's negligent performance under this contract, and particularly without limiting the foregoing, caused by, resulting from, or arising out of any act of omission on the part of the vendor in their negligent performance under this contract.
- The Vendor shall maintain such insurance as will protect against claims under Worker's Compensation Act and from any other claims for damages for personal injury, including death, which may arise from operations under this contract. The Vendor and its officers, employees, or agents are independent contractors and are not employees of the State of Delaware.
- The selected Vendor shall secure and furnish the Department a certificate of insurance evidencing regular Liability, Property Damage, Worker's

Compensation, and Automobile insurance coverage from an insurance company authorized to do business in the State of Delaware. The State of Delaware- Department of Transportation shall be named a certificate holder on the certificates of insurance. The insurance agency shall provide the Department with 30 days notice in the event the policy is canceled or not renewed.

During the term of this contract, the vendor shall, at its own expense, carry insurance minimum limits as follows:

| | | |
|----|-----------------------------------|-------------------------|
| a. | Comprehensive General Liability | \$1,000,000 |
| b. | Medical or Professional Liability | \$1,000,000/\$3,000,000 |
| c. | Misc. Error & Omissions | \$1,000,000/\$3,000,000 |
| d. | Product Liability | |

The successful vendor(s) must carry (a) and at least one of (b), (c), or (d) listed above, depending on the type of service or product being delivered.

If the contractual service requires the transportation of Departmental clients or staff, the successful vendor(s) shall, in addition to the above coverages, secure at its own expense the following coverage:

If the contractual service requires the transportation of departmental clients or staff, the vendor shall, in addition to the above coverages, secure at its own expense the following coverage:

| | | |
|----|--|---------------------|
| e. | Automotive Liability (Bodily Injury) | \$100,000/\$300,000 |
| f. | Automotive Property Damage (to others) | \$ 25,000 |

The vendor shall provide a certificate of insurance as proof that the vendor has the required insurance.

Notwithstanding the information contained above, the successful vendor(s) shall indemnify and hold harmless the State of Delaware, the DDOJ, and its employees from contingent liability to others for damages because of bodily injury, including death, that may result from the successful vendor(s)'s negligent performance under this contract, and any other liability for damages for which the successful vendor(s) is required to indemnify the State, the DDOJ and its employees under any provision of this contract.

- **Performance Requirements-** The selected Vendor will warrant that it possesses, or has arranged through subcontractors, all capital and other equipment, labor, materials, and licenses necessary to carry out and complete the work hereunder

in compliance with any and all Federal and State laws, and County and local ordinances, regulations and codes.

- This RFP (including any written questions and Department responses), the executed contract between the successful vendor and the Department, the Vendor's demonstration, and the successful Vendor's proposal, shall constitute the Contract between the Department and the Vendor. In the event there is any discrepancy between any of these contract documents, the following order of documents govern so that the former prevails over the latter: Contract, RFP (including written questions and answers), any addenda to the RFP, the selected Vendor's demonstrations, and then the selected Vendor's proposal. No other documents shall be considered. These documents contain the entire contract between the Department and the Vendor.
- The laws of the State of Delaware shall apply, except where federal law has precedence. The selected Vendor consents to jurisdiction and venue in the State of Delaware.
- The selected Vendor must have a valid Delaware business license in order to receive payment for services.
- The successful firm must furnish a Performance Bond in the amount of 100% of their proposal value made payable to the State of Delaware and prepared on an approved form as security for the faithful performance of the contract. The surety thereon must be such surety company or companies as are acceptable to the State of Delaware and are authorized to transact business in this State. Attorneys-in-Fact who sign proposal bonds must file with each bond a certified copy of their power of attorney to sign said bond.

Performance bond is required until final acceptance of the system. A release date will be determined by the Department.

- In performing the services subject to this RFP, the Vendor agrees that it will not discriminate against any employee or applicant for employment because of race, creed, color, sex, or national origin. The successful Vendor shall comply with all federal and state laws and policies pertaining to the prevention of discriminatory employment practices. Failure to perform under this provision constitutes a material breach of contract.
- With respect to work provided to or conducted for the state by a Vendor, the Vendor shall be responsible for the professional quality, technical accuracy, timely completion, and coordination of all services furnished to the State by the Vendor, or any of its subcontractors.
- The Vendor shall follow practices consistent with generally accepted professional and technical standards.
- The Vendor shall be responsible for ensuring that all services, products and deliverables furnished to the State are coordinated with the Department and are consistent with practices utilized by, or standards promulgated by State of Delaware.

- If any service, product or deliverable furnished by a Vendor does not conform to Department standards or general practices, the Vendor shall, at its expense and option either (1) replace it with a conforming equivalent or (2) modify it to conform to Department standards or practices
- The successful Vendor certifies that it has not employed or retained any company or person other than a bona fide employee working for the successful Vendor, to solicit or secure the contract and that he has not paid or agreed to pay any company or person other than a bona fide employee, any fee, commission, percentage, brokerage fee, gift, or any other consideration, contingent upon or resulting from the award or making this contract.
- For breach or violation of this warranty, the Department shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift, or contingent fee. Notwithstanding anything in the errors and omissions policy to the contrary, the standard of performance with which the successful Vendor must comply is the degree of care and skill ordinarily exercised under similar conditions by other like firms currently practicing in this state.
- If the scope of any provision of this Contract is too broad in any respect whatsoever to permit enforcement to its full extent, then such provision shall be enforced to the maximum extent permitted by law, and the parties hereto consent and agree that such scope may be judicially modified accordingly and that the whole of such provisions of the Contract shall not hereby fail, but the scope of such provisions shall be curtailed only to the extent necessary to conform to law.
- The selected Vendor is prohibited from divulging any information attained during the work activities for the Department.
- Every team member of the successful Vendor that shall require access to the State of Delaware or Department networks must complete a criminal background check, and sign and comply with the computer acceptable use, security and confidentiality policy. The Department will make the final determination of granting network access.
- The Department reserves the right to annul any contract if, in its opinion, there is a failure at any time to perform adequately the stipulations of this invitation to respond, and the general conditions and specifications which are part of these proposals, or in any case of any attempt to impose upon the Department services of an unacceptable quality. Any action taken in pursuance of this latter stipulation shall not affect or impair any rights or claim of the Department to damages for the breach of any covenants of the Contract by the Vendor.
- Should the selected Vendor fail to furnish any item or items, or fail to complete the required work included in the contract, the Department reserves the right to

withdraw such items or required work from the operation of the Contract without incurring further liabilities on the part of the Department.

- The Department may terminate the contract any time upon 30 days written notice to the Vendor.

1.16 Excluded Parties

Parsons Brinckerhoff, Inc. (formerly PB Americas, Inc.) and Open Roads Consulting, Inc. have assisted in the preparation of documents for this solicitation. Therefore, Parsons Brinckerhoff, Inc. and Open Roads Consulting, Inc, as well as any of their Divisions, have been excluded from applying for this solicitation. Any contact from proposing Vendors to Parsons Brinckerhoff, Inc. or Open Roads Consulting, Inc. will disqualify the Vendor(s) proposal unless addressed in writing in advance by the Department.

1.17 Debarment or Suspension

Any individual, business, organization, corporation, consortium, partnership, joint venture, or any other entity including subcontractors currently debarred or suspended is ineligible to bid. Any entity ineligible to conduct business in the State of Delaware for any reason is ineligible to respond to the RFP.

2. Background Information

2.1 Current Functionality

DelDOT has an existing IVR system providing transit information to callers of the designated 800 number. The initial IVR system will transfer all transit requests to the existing Delaware Transit Corporation (DTC) system. A second phase of the project will be to integrate transit information directly into the 511 Plus IVR system once the planned AVL system upgrade is in place. This planned expansion must be supported by the base delivered system with only supplemental data type work (data extraction, configuration, call tree adjustments and new voice recordings). Transit data is expected to be provided from the DTC AVL system from Trapeze approximately four to six months after notice to proceed for integration in the system and included in the final systems acceptance testing activities. The data will be extracted from the DTC transit system and passed to the IVR vendor via the data Enterprise Service Bus (ESB).

2.2 Project Objectives

DelDOT plans to deploy a full featured transportation information based Interactive Voice Response (IVR) platform to share real time information with the general public. The project has been named the DelDOT 511 Plus system.

511 Plus will fully integrate the DelDOT traffic data, DTC transit data, weather and other information into an IVR solution. Transit data will be integrated in a two step process with Phase 1 being a simple call transfer and the phase 2 effort, once the planned transit AVL system upgrade is in place and accepted, will included real time transit information. The Vendor shall provide a description of the activities required to integrate the transit data into the base delivered system when the data is available via the ITMS ESB (route information, schedule information, vehicle location data, expected arrival data, etc.). Include in the project cost estimate the transit AVL data integration which will be a part of the base contract. The transit AVL data will be available 4 (four) to 6 (six) months after notice-to-proceed.

DelDOT will provide the following system elements:

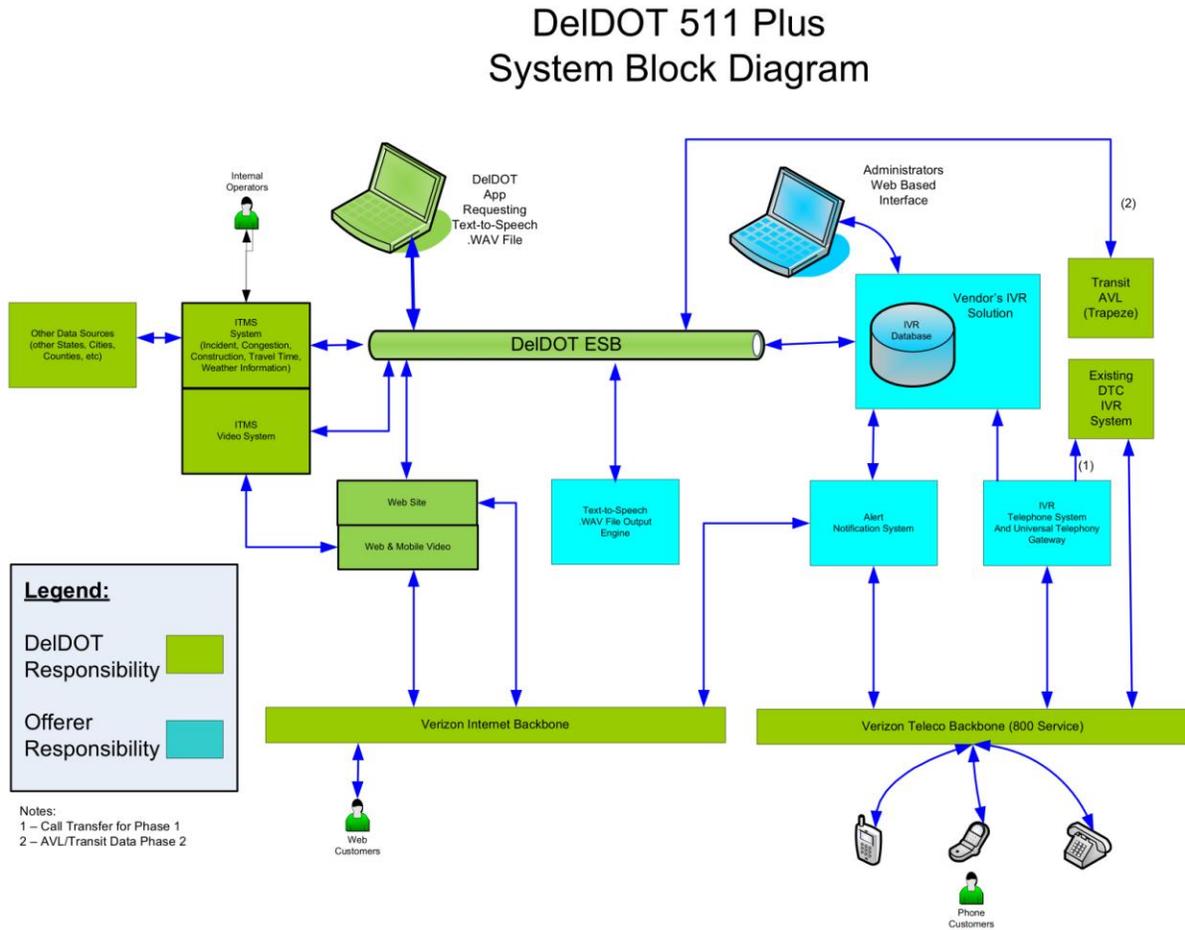
- ITMS Enterprise Service Bus (ESB) – DelDOT provided data will be made available via subscribers (IVR system in this case) to DelDOT TMC ESB. Various DelDOT sub systems will be producers of data onto the bus. The Vendor will subscribe (connect & listen) to the bus and consume subscribed to messages. Messages will be exchanged via XML format following the IEEE 1512 Standards. Messaging standards samples are provided in the appendix of this RFP.

- ITMS Data – ITMS data will be pulled from the various traffic data collection subsystems and published to the ESB for access and use on the IVR subsystem. Traveler information will be available to the Vendor at contract Notice to Proceed.
- ESB Message-Oriented Middleware (MOM) - DelDOT TMC ESB will be using Apache ActiveMQ as its MOM package. The Vendor will be able to publish and subscribe to the ESB via numerous languages (Java, C, C++, etc). Where appropriate all messages will follow the subset of IEEE 1512 standards provided by DelDOT at the time of Vendor selection.
- Text-To-Speech Generation Input Requests- DelDOT ITMS ESB will be leveraged for the exchange of Text to Speech audio (WAV) files from the TMC services to the IVR system and back. Documentation on the ITMS ESB subsystem and sample message standards is included in the Appendix B of this document. The process should involve:
 - DelDOT TMC will request Text to Speech audio file to be generated by publishing a request on the bus.
 - The IVR system will consume published message.
 - The IVR system will generate Text to Speech Audio file (.WAV and .MP3).
 - Created .WAV and .MP3 files will be encoded in a Binary Message (BlobMessage and/or ComplexTypeMessage) that will be published back to the ESB.
 - DelDOT service will consume and use the Audio files.
- Web Site – the externally facing public web site to provide citizens with traveler information in a web browser and mobile hand held device is an existing DelDOT service. The web site will be developed / maintained by DelDOT. The data displayed on the website will be the same as in the ITMS ESB.
- Traffic Data – DelDOT will provide the real time transportation data which is entered and stored in the ITMS system in an Oracle Enterprise database. This data will be made available to the Vendor through the ITMS ESB and will include the following types of data (existing and future):
 - RTTA – real time travel advisories (incidents) which includes:
 - Amber Alerts
 - Homeland Security Alerts
 - GIS Data – traffic information geo-referenced via latitude and longitude
 - Construction data

- Computer Aided Dispatch (CAD) – 911 police entered traffic data from the New World CAD system
- Special Events – traveler information for special events (i.e. NASCAR races at Dover Downs) for travel times, parking, alternative routing, evacuation information, etc.
- STR – scheduled traffic restrictions (construction information)
- Travel Time Data – travel time data and delay information for geo referenced roadway links
- Predictive Travel Time Data - travel time data for geo referenced roadway links for future travel within the next 30 and 60 minutes
- Breaking News – traffic new releases and messages from the DelDOT traffic radio station in .audio file format (.WAV and .MP3), tolling rates and public service announcements
- Transit data – bus and rail, schedule information and schedule changes
- Weather Data – Publically available NOAA data shall also be used for IVR responses. Weather data will be provided to the vendor by the ITMS ESB.
- Telecommunication – DelDOT will provide the 800 number and 511 provisioning service, telephony service lines and the Vendor will provide the telephone edge gear for the IVR access. The services will be from an existing state contract, which is currently Verizon.

2.3 System Block Diagram

A system level block diagram of the project is provided below in Figure 1 representing the planned elements of the system.



The following high level elements shall be provided by the Contractor:

- Telephony Interface – DelDOT will provide the provisioned 800 number and PRI circuits to the TMC. The Vendor will provide a telephony universal gateway to convert from the Verizon TDM format to IP SIP protocol.
- IVR Database Engine – the central repository for the system information so that all Vendor delivered applications store their information in a commonly shared location.
- Alert System – the engine and dissemination of travel information in the form of subscription services such as email and SMS messages.
- IVR Engine – the 511 telephone service for customer to call for traveler information.
- Stand-Alone Text-to-Speech Engine – the 511 Plus system shall support separate text-to-speech functionality for grammars not pre-recorded and request submissions from other DelDOT apps via the ITMS ESB. The Vendor shall provide a separate text-to-speech set of servers, software licensing and developer tool kit (API, SDK, etc.) to allow DelDOT to submit text messages to the standalone text-to-speech server that are converted to Audio files (.WAV and .MP3) and published to the ITMS ESB for storage in the ITMS database for use by other applications.
 - The process will involve:
 - DelDOT TMC will request Text to Speech audio file to be generated by publishing a request on the ITMS ESB.
 - The IVR system will consume published message.
 - The IVR system will generate Text to Speech Audio file (.WAV and .MP3).
 - Created audio file will be encoded as Base64 and added to a normal Text Message as a string that will be published back to the ESB.
 - DelDOT service will consume and use the Audio file.
- Administration Access – provision of a web based interface to access the system for performance monitoring, and floodgate message insertion (including incidents and events) in real time.
- System Maintenance Support – Up to three (3) years of support for system operations and maintenance following final acceptance of the system by DelDOT. Final acceptance will require the Vendor to successfully complete both the System Acceptance Test plan and the thirty (30) day observation period.

3. Traveler Information Scope of Work (SOW)

The scope of work for the DelDOT 511 Plus system will be to deliver a fully functional IVR based 511 system supporting both English and Spanish languages. The system is to be sized to support 48 concurrent calls with the initial delivery expandable to 128 concurrent calls with only COTS software licensing modifications. Requirements for the 511 system are provided in the table of requirements which is included in Appendix C of this document.

3.1 Project Management

A project management plan shall be developed by the Vendor for DelDOT review and approval. The management plan shall include items such as:

- **Scope Statement** – Definition will state what is and in not included as deliverables for the project.
- **Work Breakdown Structure/Project Schedule** – Detailed work plan with task structure, dependencies, durations, start/finish dates, milestones and assignees defined.
- **Acceptance Management Plan** – Definition of system acceptance testing approach - an additional document description is provided below.
- **Issue Management Plan** – Definition of process for identifying, analyzing and addressing project issues including escalation procedures.
- **Staffing Plan** – Description of project staffing with roles and responsibilities defined including contact information for each individual in the staffing plan.
- **Change Control Plan** – Description of plans for version control of documentation and system elements – an additional document description is provided below.
- **Risk Management Plan** – Plan to identify and mitigate risks for all stakeholders and project deliverables. These could be technical, financial, business process, support, etc. related.
- **Communications Management Plan** – Plan on progress reports (accomplishments), status reports (current standing), milestone meetings, etc.
- **Procurement Management Plan** – Plan on how to execute resource deliverables, contracts, licensing, etc.

3.2 Acceptance Management Plan

Acceptance testing will be based on the DelDOT approved System Acceptance Test Plan (SAT). Successful execution of the SAT will signify the beginning of the operational 30 day observation period.

The selected Vendor shall develop a SAT plan for DelDOT review and approval that includes the elements such as:

- Introduction
 - Purpose
 - Reference documents
 - Traceability matrix
 - Points of Contact
- Testing Process and Methodology
 - Test Plan Objectives
 - Testing Methods
 - Assumptions
 - Source documents
 - Environmental needs
 - Training needs
 - Testers
 - DeIDOT responsibilities
 - Problem Identification and Resolution
 - Test Script
 - Issue Tracking
 - Disposition of Signed Scripts and Final Acceptance Signature Sheet
 - Estimated Schedule for Testing and Locations
- Final Acceptance Sign Off Block (when all scripts are accepted)

Test scripts shall be a step-by-step description of the operator actions required to execute the test with a description of the expected outcome. Each test script will include a sign off block for the tester, DeIDOT observer and an indication of pass, fail, could not be completed, accepted as is and a comment area.

A testing log shall be created and maintained by the Vendor. The log shall include items such as:

- Unique issue number – for each issue noted for the test. A test may have multiple issues that were observed, in which case each issue is tracked separately.
- Component – The affected part of the system, e.g., Telephony, IVR, data or Traveler Alert System.
- Acceptance Test # and System Requirement. # – This will include the “Acceptance” Test script number affected by this issue if using a test script verification method or System Requirement number if using other verification methods.
- Date – The date the issue was observed.
- Tester – The person or persons that observed the issue.
- Issue Description –The step within the script that had an issue and a detailed description of the problem so that the issue can be repeated.
- Status – For example, Failed, Ready to Retest, Passed, Defer.
- Severity – For example, Minor, Major, Critical.

- Script Procedure Issue – Issues with the test procedure itself, not the software.

Testing shall be conducted by the Vendor with DelDOT observing all tests. DelDOT reserves the right to retest any and all items in the event of a test script failure. Retesting will be based on the Vendor's description of the action required to fix the problem. Software changes will require more retesting than data changes.

Acceptance test shall include a demonstration of the system failover aspects of the N+1 architecture. Each component shall be failed over and returned to the original configuration. Each step shall be documented and included in the system training for DelDOT.

The project shall include a 30 day observation period to commence upon successful completion of the system acceptance test plan as observed by DelDOT. The observation period is to demonstrate that the delivered solution operates without error under public access and typical loading conditions. The Vendor shall check the operational state of the system on a daily basis during the entire observation period and report to DelDOT as to the observed status. Should an issue be observed, reported or detected, the observation period shall stop, the Vendor shall correct the defect and the observation period is restarted after demonstration of the fix and concurrence from DelDOT.

An observation period stoppage shall be restarted under the following rules:

- A stoppage in the first 7 days shall be corrected and the 30 day calendar begins at the point in which the stoppage occurred. For example, if the observation test is stopped on day 3 of the observation period, once the defect is corrected, the observation period will resume at day 3 of the 30 day observation period.
- A stoppage on day 8 through 14 shall be corrected and the 30 day calendar begins at the day 8 in the 30 day observation period.
- A stoppage on day 15 through 30 shall be corrected and the 30 day calendar begins at the day 15 in the 30 day observation period.

3.2.1 Issue Management Plan

The selected Vendor shall develop an Issue Management Plan that describes the approach to addressing project conflicts. The plan shall include topics such as:

- Issue definition
- Roles and responsibilities
- Issue reporting and tracking
- Issue escalation
- Issue resolution

3.2.2 Staffing Plan

The Vendor shall develop a project Staffing Plan that describes the approach to staffing the project and addressing changes that may occur. The plan shall include topics such as:

- Project organizational structure
- System Delivery Responsible Person
 - Interactive Voice Response (IVR) subsystem
 - System Engineering for hardware, commercial software, telephony interface and networking
 - Data collection, entry, validation and procedures
 - Training and documentation
 - Testing
 - Configuration management
- Key staff retention, succession and replacement (if needed)
- Post delivery support personnel

3.2.3 Change Control

The Vendor shall develop a change control document that describes the approach to handling the following issues, changes, and approvals for the changes:

- System Requirements
- Project Plan
- Schedule
- Software Design Descriptions and Design documents
- Source code
- Data
- Voice files
- Application Configuration Data
- Configuration File(s) / Script(s)
- Database installation and creation scripts
- Systems Test Scripts
- Manuals
- Training Materials

3.2.4 Procurement Management Plan (PMP)

The Vendor shall develop a PMP plan for DelDOT review and approval that includes the elements such as:

- Introduction
 - Purpose
 - Types of contracts or agreements required by the project
 - Organizational documents to facilitate procurement

- Vendor lists, points of contact
- Assumptions/constraints affecting acquisitions
- In accordance with the project schedule, handling lead times from vendors
- Aligning warranty periods with acceptance
- Identifying performance bonds

- Contract Statement of Work
 - Identifies products and services
 - Describes procurement items
 - Explains warranty items

3.2.5 Communications Management Plan (CMP)

The Vendor shall develop a CMP plan for DelDOT review and approval that includes elements such as:

- Lessons learned from prior project experience
- Progress reports (accomplishments)
- Status reports
- Meeting agenda
- Recurring meeting frequency
- Publish meeting minutes
- Other projects dependencies communicated
- Contract changes

3.2.6 Risk Management Plan (RMP)

The Vendor shall develop a RMP plan for DelDOT review and approval that includes elements such as:

- Scope risk mitigation
- Schedule risk mitigation
- Budget risk mitigation
- Quality risk mitigation

3.3 Delivery Location

DelDOT's 511 Plus system shall be delivered, installed tested and operational from the Traffic Management Center (TMC) located at:

169 Brick Store Landing Road
Smyrna, DE 19977

The Vendor shall perform a minimum of one (1) site visit prior to any equipment procurement to validate the installation environment needed for the DelDOT (Transportation) 511 Plus system.

3.4 Hardware

Project server and workstation hardware will be procured by DeIDOT, however DeIDOT reserves the right to have the Vendor procure all hardware. The selected Vendor's cost proposal shall include an itemization and an optional price to supply all hardware required for this project. Hardware provided will be consistent with DeIDOT State Procurement Standards where possible and based on "Blade" technology to minimize rack space needs. The Vendor shall provide a detailed list of all required project hardware that will be needed to support the technical response. The response shall include a detailed hardware list, typical cut sheets for each device (servers, network gear, back up equipment, etc.), detailed specification and cost estimate.

Vendor solutions which incorporate virtualization are acceptable provided that the vendor provided solution is scalable to handle all loads required under the 128 port ultimate configuration described in Section 3.6 below and provided that the proposed solution is in compliance with state IT procurement standards. Please see the State of Delaware, Department of Technology and Information's Enterprise Standards and Policies web page (<http://dti.delaware.gov/information/standards-policies.shtml>) for a listing of the state standards governing server operating systems and virtualization host O/S.

DeIDOT will procure the hardware and install the standard DeIDOT base image on the equipment. The hardware will be installed in DeIDOT provided racks at the TMC and the Vendor shall access the racks via remote connection and/or physical access at the DeIDOT Traffic Management Center.

The Vendor shall supply network equipment that will meet or exceed 99.8% annual uptime performance, excluding 10 hours of planned annual maintenance and network operating system/firmware updates.

The selected Vendor shall supply all necessary switch cabling (RJ-45 CAT6 rated pre-manufactured cable and connector ends, male RJ-45 connectors) from the DeIDOT core network (Juniper VRF equipment) to the supplied DeIDOT (Transportation) 511 Plus network switch. All cables shall be labeled and in cable management systems where possible.

The selected Vendor shall also supply all necessary switch cabling (RJ-45 CAT6 rated pre-manufactured cable and connector ends, male RJ-45 connectors) from the DeIDOT (Transportation) 511 Plus network switch to the DeIDOT (Transportation) 511 Plus servers/enclosures. All cables shall be labeled and in cable management systems where possible.

The DeIDOT 511 Plus system shall incorporate an N+1 hot failover design for all physical hardware provided. The proposal response shall include a hardware diagram and supporting budget estimate for all the equipment required for the project using an N+1 hot failover design and a separate set of staging hardware to test

enhancements/patches/upgrades. The diagram must include any hardware expected to be supplied by DelDOT and clearly marked as such. The failover hardware will be collocated at the TMC. The Vendor shall include hardware pricing back up as a part of the response. Back up materials could be screen shots of pricing from the internet or formal quotes from vendors.

3.5 Commercial Software

DelDOT provided hardware will be supplied with the DelDOT standard image which includes the operating system, backup software/agents, and anti-virus software. Please see the State of Delaware, Department of Technology and Information's Enterprise Standards and Policies web page (<http://dti.delaware.gov/information/standards-policies.shtml>) for a listing of the state standard applications.

The Vendor must provide a detailed list of commercial software that is required. All commercial software other than that provided by DelDOT shall be the responsibility of the selected Vendor. DelDOT's IVR system shall use Nuance as the base IVR platform. No other IVR engines will be accepted.

All commercial software provided by the selected Vendor shall be registered to DelDOT. COTS Software warranty support shall be provided for a period of three years from final acceptance.

3.6 Telephony Interface

DelDOT will provide the Vendor with telephony circuits from Verizon. The circuits will be PRI's typically delivered as T-1 circuits with 23 usable lines per T-1. The Vendor shall provide the appropriate edge gear to interface with the Verizon circuits and be able to support a base delivery of 48 voice circuits and expandable to a minimum of 128 voice circuits as a part of the base system configuration. Full capacity may best be served with a T-3 service and therefore the edge gear shall have the ability to support a T-3 interface. Vendor shall provide a detailed explanation of how the proposed solution will meet the base and expanded telephony requirements.

The telephony gear for this project shall be similar to a Cisco AS5400XM Universal Gateway or approved equal. This device is expected to provide the translation of calls received from Verizon in TDM format to IP SIP protocol for delivery to the IVR System. Other configurations may be considered and should be clearly explained in the response.

3.7 Vendor Provided Software

All Vendor proprietary and/or developed software for this project shall be licensed to DelDOT. There shall not be any restrictions that limit DelDOT from operating the system or need to pay recurring costs (except for COTS). The Vendor's response shall include the proposed license agreement(s) and is subject to DelDOT approval. Restrictive licensing can be a cause for proposal rejection.

3.8 System Recovery Media

Upon completion of the system configuration, acceptance testing and observation period, the Vendor shall create a set of recovery media to allow complete server restores from a “bare metal” state. The recovery media and restoration software shall be delivered to DeIDOT as part of the final system acceptance.

3.9 Power

Uninterruptable power will be provided by DeIDOT as either 110 V, single phase or 220 V, 3-phase. The Vendor must clearly identify power requirements as part of the power audit memorandum that must be included in his proposal.

The Vendor shall provide 19” rack mount power distribution panels. The distribution panels shall support all the power connections needed for the system hardware with a minimum of 25% spare outlets on each distribution panel.

The Vendor’s proposal shall include a power audit memorandum of the equipment recommended for the solution being supplied (including the hardware that DeIDOT is purchasing for this contract) for installation at the TMC data center. The power audit should be supported by catalog cuts and technical data for all proposed hardware and provide individual power consumption for each component as well as tabulate the total power consumption for the proposed solution.

DeIDOT will review and approve the power audit memorandum. The memorandum is a milestone payment item.

3.10 Networking and System Architecture

Networking for the project will require a collaborative design effort between the Vendor and DeIDOT. A high level network diagram is provided below to provide a general understanding of the networking environment.

The Vendor will be required to work with DeIDOT’s Office of Information Technology (OIT) to discuss and design the technical configuration and port/routing protocols required to support the DeIDOT (Transportation) 511 System.

DeIDOT will supply the network segment, core network equipment, core network configuration, and core network connection to the ITMS Virtual Routing Firewall (VRF) equipment in use at the TMC. DeIDOT will be responsible for maintaining and operating the core network equipment and the VRF segment equipment.

Using the network block diagram below, the Vendor shall determine the hardware required to support the 511 System network equipment to be used inside the VRF segment. The Vendor shall supply a detailed description (with cut-sheets) for the network equipment that will meet or exceed 99.8% annual uptime performance,

excluding 10 hours of planned annual maintenance and network operating system/firmware updates.

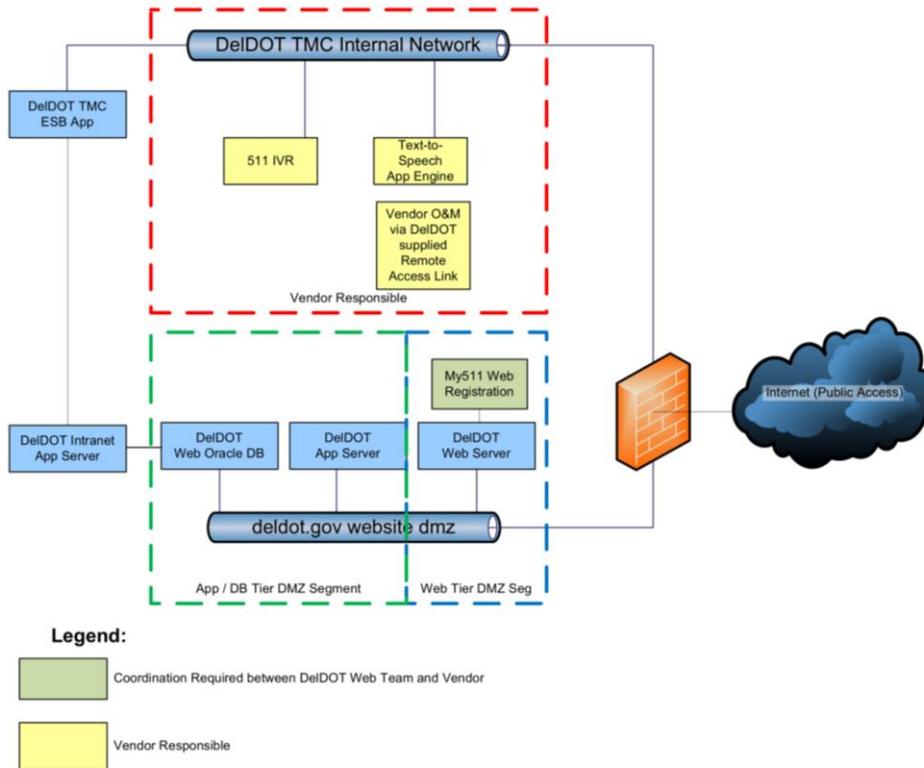


Figure 1 – Networking Block Diagram

The selected Vendor shall meet with DelDOT OIT staff under the direction of the DelDOT project manager to discuss the system networking needs and develop a Systems Architecture and Networking Plan for the project. This document will be reviewed and approved by DelDOT and is a milestone deliverable for the project. Topics to be included in the document are:

- Hardware Configuration Details – chassis descriptions, server details, network gear description, primary and backup servers and peripherals.
- Hardware Documentation – serial numbers, machine names, chassis location, IP addressing, physical hardware and networking diagram, user names and passwords, etc.
- Commercial Software Documentation – commercial software list, license keys, warranty description/contact information, registration information, etc.

- Networking Description - IP address scheme, network gear configuration, user names, passwords, data flows

3.11 MY 511

The Vendor shall describe the MY 511 features included in the base delivery. The basic definition of MY 511 is as follows:

MY 511 is a free, personalized service on the phone and web that allows users to customize 511 for personal settings. With MY 511, the user builds their own bypass phone menu options to go directly to user defined information.

The Vendor may provide an optional MY 511 set of services. DelDOT will handle web site and mobile phone applications in-house. The Vendor will be required to coordinate with the DelDOT Web Team on the design and implementation of MY 511 account registrations in order to ensure account information is identical for both systems. The Vendor may consider integration with the web site and mobile applications for support functions in the proposed MY 511 options, but the level of support needs to be clearly described in the approach. DelDOT will review optional services as expansion capability. The pricing section provides for the opportunity to have these services added to the project.

3.12 Text-to-Speech Audio File Generation

The Vendor shall provide DelDOT with a separate set of text-to-speech servers from the 511 Plus IVR system that will allow DelDOT to submit messages via the ESB to the server and it returns a converted .WAV and .MP3 file format that is Base64 encoded and sent back via the ESB for storage and use by other DelDOT applications. The servers shall be configured to support hot failover. There shall be a set of servers for English text-to-speech conversion and a set for Spanish text-to-speech conversion.

The servers supplied shall be sized as standalone text-to-speech engine/server and shall support (hardware and COTS licensing) up to 500 messages per hour of 1,000 characters per message. The COTS licensing shall be for an unlimited number of requests.

Text-To-Speech Audio Generation shall be accomplished via the DelDOT ITMS ESB. A DelDOT developed application will submit the text message to the ESB and the Vendor shall process the message and create Text to Speech audio (.WAV and .MP3) files from the TMC services to the IVR system and back. The process shall follow the process described below:

- DelDOT TMC will request Text to Speech audio file to be generated by publishing a request on the ESB.
- The Vendor's IVR system will consume published message.

- The Vendor's IVR system will generate Text to Speech Audio file (.WAV and .MP3).
- The Vendor's created WAV/MP3 file will be encoded as Base64 and added to a normal Text Message as a string that will be published back to the ESB
- DelDOT service will consume and use the Audio file.

3.13 Training

The Vendor shall provide a minimum of 32 hours of system administration training on-site (at the DelDOT TMC location), for supporting the DelDOT (Transportation) 511 Plus system during the initial year of deployment and the final year of vendor of maintenance (prior to full DelDOT turnover). This shall be provided in two sessions (16 hours each) with one session prior the start of systems acceptance testing and the second session after the 30 day observation period. The Vendor shall provide DelDOT with a training plan that describes the training objectives, topics and schedule.

System administration training shall include sufficient detail such that the trainees can perform the following types of activities on their own:

- Admin console access/privileges/functions.
- Floodgate message management (add, remove, modify).
- Alarm notification configuration and operation.
- Report creation, modification and print/saving.
- Scheduled maintenance activities (system backups, archives, restore health monitoring, installation of patches and updates, etc.).
- Performance monitoring (telephony, hardware & software (including application log files & display messages), Windows O/S issues (disk space, system utilities, event logs).
- Speech recognition update (identify needed additions or changes to speech recordings).
- Backup Speech Recordings.
- User account management.
- Comment retrieval, storage, deletion for customer feedback function.
- Operations and Maintenance activities.

The Vendor shall provide all training materials in electronic format. DelDOT shall retain the rights to reproduce and distribute all materials in conjunction with the operations and maintenance of the system.

All training shall be conducted on-site at DelDOT.

Each training session shall include a formal sign in sheet to record the date of the training and the instructor(s)/attendees. At the end of the training session, the Vendor

shall provide the attendees with a course evaluation form. The sign-in sheet and evaluation forms shall serve as the trigger for the training milestone payment.

3.14 System Documentation

The Vendor shall provide one (1) hard copy and one (1) electronic version of the system user/administration manuals for the DelDOT 511 Plus system and network equipment.

Upon successful completion of the 30 day observation period, the Vendor shall provide the following items as project documentation:

- System backup and disaster recovery files/code/disks/tapes/documentation
- All vendor executables in electronic format
- All system data including voice recordings (.WAV and .MP3 files)
- Final system configuration design document
- Training materials

4. System Maintenance Support

The Vendor shall provide system administration support of the delivered and accepted system for a period of three (3) years. Upon completion of the system acceptance testing phase and successful conclusion of the 30-day observation period, the Vendor will enter into the maintenance phase of the project. Maintenance will be in the form of the following services:

- System wide hardware, operating system and software patches.
- Telephony gear configuration, maintenance and troubleshooting support for the universal gateway provided on the project.
- The Vendor shall apply product patches, perform upgrades, and completing necessary testing for each before migrating any software changes from staging to production environment.
- Enhancements, and/or upgrades researched and developed by the Vendor during the life of the contract
 - Any enhancements and/or upgrades to the system that would require additional costs to DelDOT or could affect performance of the system shall be pre-approved by DelDOT.
- Support for additional voice recording based on system feedback and expansion
 - Approximately 2,000 new words per month for estimate purposes
- On-site emergency call out support:
 - Vendor shall have a person on site within 4 hours of notification in the event of a system outage. Vendor shall provide a point of contact that is available 24 hours per day, 7 days per week and 365 days per year (24 X 7 X 365).

- Vendor shall have a person on site within one business day of notification for non-critical issue as determined by DelDOT. Vendor shall provide a point of contact that is available 24 X 7 X 365.
- Failure to meet the service response times shall result in penalties of \$200.00 per hour until the appropriate technical support person arrives on site.
- Weekly system back up and file restoration confirmation for the daily incremental, weekly full and monthly full back ups.
- The Vendor will be required to fully test all system updates and patches before they are applied to the system. The results of this testing, along with documentation of testing methodologies and test results shall be submitted to the DelDOT Project Manager for approval before any updates are applied to the system.

The Vendor shall include the cost of three (3) years of System Maintenance support in their cost proposal. System Maintenance support will be invoiced and paid for on a fixed price per month basis or as agreed upon by the Department.

5. PROPOSAL REQUIREMENTS

5.1 Proposal Documents

By responding to this Request for Proposal, the Vendor hereby grants DelDOT a license to distribute, copy, print, or translate the submission for the purposes of the evaluation and any subsequent contract. Any attempt to limit DelDOT's right in this area may result in rejection of the submission.

5.2 Submission of Proposals

The Department will receive sealed proposals in response to this RFP until the date and time indicated in Section 5.4. Proposals must be delivered and addressed as indicated. It is the responsibility of each Vendor to have proposals received at the location identified in this section by the date and time specified. Proposals will be opened and submitting Vendor names publicly read on the date and time indicated. Facsimile or email responses to this Request for Proposal are not acceptable.

Proposals must be delivered in sealed envelopes and be clearly marked on the outside:

'511 Travelers Information System, RFP No. 1599' and delivered to:

Department of Transportation
Contract Administration
Bidder's Room (Room B1.11.01)
800 Bay Road
P.O. Box 778
Dover, DE 19903

An original and one (1) copy of the Price Proposal must be submitted in a separate, sealed envelope. It is the Vendor's obligation to make sure proposals arrive on time. Late proposals will be returned.

5.3 Changes to Initial Proposal

The Vendor may change a previously submitted initial proposal by withdrawal, amendment, or submission of a replacement if done prior to the RFP due date and time. The information or request should be submitted in writing on company letterhead or equivalent and contain the signature(s) of the person(s) who submitted the original proposal. Vendors must indicate on the outside of the envelope that the proposal contained within replaces and takes the place of a previously submitted proposal or part thereof. Vendors shall clearly indicate that it is their intent is to withdraw a previously submitted proposal prior to the RFP closing. Requests to withdraw a proposal may require a confirmation email or facsimile.

5.4 Proposal Due Date/Time – 2:00 p.m. Tuesday, ~~May 8~~ **May 22, 2012 (local time)**

Responses to this Request for Proposals are to be delivered to the address indicated in Section 5.2 by this date and time. The Department's time shall be the official time.

5.5 Extensions

The Department may extend the time and place for the receipt and opening of proposals on not less than two (2) calendar days notice by electronic means to those bidders who requested copies of the RFP.

5.6 Delaware's Freedom of Information Act

In order to comply with the State of Delaware's Freedom of Information Act, firms responding to this Request for Proposal are *encouraged* to prepare one (1) electronic copy of their proposal with any proprietary or confidential information redacted. This copy should be clearly marked as "Redacted Copy". Copies of each proposal may be kept as part of the agency file and open to inspection by any person permitted by law. Firms should review Delaware's Freedom of Information Regulations, section 6, Requests for Confidentiality, on the DeIDOT Website <http://regulations.delaware.gov/AdminCode/title2/2000/2100/2101.shtml#TopOfPage> and Section 10002(g) "Public Record" of the Delaware Code, <http://delcode.delaware.gov/title29/c100/index.shtml> to determine what information may be considered proprietary or confidential and may be redacted from the proposal.

5.7 Submitted Copies

An original and five copies of the Proposal must be submitted. An original and one (1) copy of the Price Proposal must be submitted in a separate, sealed envelope per section

5.2 of this document. An authorized representative of the company submitting a proposal must sign the proposal. Notification of the proposal award and all communications will be made by e-mail.

Along with the originals, please submit three (3) CDs in standard Office format. Each CD should contain one of the following and indicate as such:

- **The Technical Proposal**
- **The Price Proposal**
- **The Technical Proposal with any confidential information redacted**

5.8 Proposal Rejection

Failure to follow instructions contained in this document may be cause for rejection of submitted proposals. A proposal may be rejected by the Selection Committee for one or more of the following reasons:

- The Vendor is determined to be non-responsive or non-responsible,
- The proposal is unacceptable,
- The proposed price is unreasonable, or,
- The proposal is not advantageous to the State.

5.9 Disadvantaged Business Information

A five percent (5%) DBE goal has been established for the sum total of all federally assisted tasks associated with this Agreement. The Department will require ongoing reviews and approval of *good faith efforts* before a Notice to Proceed is issued. Department DBE Program staff will monitor this Agreement to ensure that good faith efforts are being made to meet the DBE goal. DBE firms must be certified through DelDOT's DBE Program in order to qualify toward meeting the goal.

5.10 Proposal Submission Details

The Vendor shall submit an “original” (so marked) and five (5) hard copies of the Technical proposal. The Vendor shall also submit an original and one (1) copy of the Price Proposal in a separate, sealed envelope. In addition to the hard copies of the proposal, the Vendor shall submit one complete and exact copy of the entire proposal on CD-ROM in standard office format.

Evaluation of proposals is made easier and more efficient when Vendors respond in a similar format. The following is the format and sequence the Department recommends to be followed in order to provide consistency in Vendors’ responses and to ensure proposals receive full and equal consideration.

All pages of a submission should be consecutively numbered. All proposals must be bound with documents 8.5”x11” with the name and address of the Vendor and the RFP number clearly written on the face of the binder. There are no limitations on the number

of pages, with the exception of resumes, which should be limited to **two (2)** pages for each individual resume and hardware cut sheets.

The Vendor or its authorized representative may withdraw its proposal in person prior to the exact hour and date set for proposal receipt, provided the withdrawing person provides appropriate identification and signs a receipt for the proposal. A Vendor may modify its submitted proposal prior to the exact hour and date set for proposal receipt only by submitting a new sealed proposal or sealed modification which complies with the RFP requirements.

The RFP Submittal shall contain the following sections:

- **Cover Page** – The proposal must contain a Cover Page, showing the RFP number, Vendor's name and address, the contact person, title, contact person's telephone number, fax, and email. The Cover page (one page) will serve as a letter of introduction and should identify the Vendor. It must be signed by the person(s) authorized to sign to commit the company to the technical solution and proposed cost. Vendor to statements made in the proposal.
- **Table of Contents** - Table of Contents including Section Numbers with page numbers.
- **Executive Summary** - The Vendor must provide a one page summary of the highlights of the proposal.
- **Section 1- Statement of Understanding**- State in succinct terms your understanding of the service required by this RFP. Provide detailed description of the services to be provided and a list of the deliverables.
- **Section 2- Team Qualifications** – Provide an organizational chart and a description of your project team. This should include a description of each key person including the project manager, systems engineering lead, software lead, quality assurance/testing lead and training lead at a minimum with resumes provided in an appendix. Indicate where each key staff member is physically located, their responsibility on this project and how long each person has been with your company. In addition, the Vendor must submit a description of each staff member's experience.

The Vendor must have demonstrated experience in all elements associated with the requested system elements and functions.

The Vendor must clearly identify all subconsultants including the company name, address, staff assigned to the project, and their individual roles. Indicate the percentage of work you anticipate the subconsultant will complete in terms of dollars and percentage based on your proposed price.

- **Section 3- DBE Participation**. Provide details of intended DBE participation for this project. Include the DBE firm's name, certification number, project role, and minimum level of project participation in terms of dollars and percentage of total contract price.

- **Section 4- Project Experience** – Provide a description of (minimum of three projects) past projects with IVR based 511 phone systems. Preference will be placed on systems that demonstrate both English and Spanish language support.
- **Section 5- References** – Provide a minimum of three references to document the firm’s experience on similar projects including type of services provided, installation locations, and references. For each project description referenced, please include a reference name, phone number, and email address. References should not be older than 5 years from the date of completion. Please provide a list of the key staff members that worked on each project and their role.
- **Section 6, Technical Approach** –Provide a detailed description of your technical approach to delivering the project. The information shall include hardware and COTS descriptions, architectural and physical diagrams of the proposed solution, high level description of the work activities and a proposed schedule for the project in Gantt chart format with dependencies and a critical path identified. Describe expansion capability, project risks and recommended mitigation steps/actions. Clearly state all assumptions associated with DelDOT’s support requirements.

The Vendor shall deliver a proven solution with little to no new software development except that required to address agency specific interfaces, style pages and recordings. The focus of the solution shall be on the installation and data required to support the DelDOT specific implementation. The technical solution write up shall clearly state what new software will be developed for this project

- **Section 7, License Agreements** – Provide any and all COTS and proprietary licensing agreements that DelDOT would be expected to execute or be expected to abide by.

Section 8, Bid Proposal Forms – Submit signed Bid Proposal Forms (Submission Form and Certification Form). These documents are located at the end of this RFP.

The Department reserves the right to reject unqualified solutions or Vendors based on the qualification submission. The determination will be based on the references and solution as provided. The Department may request additional clarification in making its determination.

6. SELECTION AND AWARD

6.1 Selection

The Selection Committee shall be comprised of State employees and their identity shall remain confidential. Vendors are reminded that contact with any DelDOT employee regarding this RFP, other than as indicated in Section 1, may result in Vendor disqualification.

The Selection Committee reserves the right to contact other jurisdictions and industry sources that may be able to verify statements made in the proposal submission.

To be eligible for selection, a proposal must be received prior to the deadline and properly signed by an individual authorized to commit the company to the conditions and costs associated with the response.

6.1.1 RFP Evaluation

The Selection Committee shall determine the firms that meet the minimum requirements pursuant to criteria of the RFP. Only those that meet the minimum requirements will be scored. The Committee may, at its discretion, contact submitting firms for clarification of their proposals. The Committee shall review all proposals and may review in-depth only those proposals found to be most reasonably likely to be selected for award.

The Selection Committee may request product demonstrations and/or additional information be submitted (i.e. clarifications) to be used to assist in the scoring of proposals. Should the Department request product demonstration, they will be held in Dover, DE.

The Selection Committee may, at its discretion, terminate negotiations with any or all firms. The Committee may request best and final offers from one or more firms, and proposals may be amended before award for this purpose.

6.1.2 Evaluation Criteria

Below are the Criteria that will be ranked:

| Category | Percentage (%) |
|--|----------------|
| Qualifications/References/Resumes/Staff Experience | 25% |
| Technical Evaluation of Project Approach and Requirements Compliance | 25% |
| Potential Overall Value | 20% |
| Project Understanding | 10% |
| DBE Participation | 10% |
| Expansion Capability | 10% |
| Maximum Score | 100% |

The following is provided to offer an understanding of components for each criterion:

Qualifications/References/ Resumes/Staff Experience

This section shall address each vendor's access to and experience working with IVR based 511 systems, and your firm's experience and ability to perform the requested services. References from current or past entities your firm has provided similar services. References should have personal knowledge of your firm, proposed staff and overall performance. Knowledge and experience in delivering multi-language based 511 systems is a plus.

Technical Evaluation of Project Approach and Requirements Compliance

This section shall address each vendor's proposed approach to the delivering a system that meets the RFP requirements in a timely manner, the qualifications of the proposed service team, and their capability to meet the needs of the Department. The vendor's completion of the requirements matrix will be reviewed and contribute to this portion of the evaluation criteria.

Potential Overall Value

This section shall address each vendor's proposed approach, work plan, and schedule for the project. This section shall be scored based on a number of factors including, but not limited to; the Vendor's compliance with the requirements matrix, number of features that are considered off-the-shelf and number of features that need to be developed for this project. Additional features above and beyond the RFP requirements that are included in the base system delivery are considered to improve the value of the proposed system.

Project Understanding

This section shall be scored based on a number of factors including, but not limited to; the description of the overall approach to the project, the completeness of the Work Plan, the feasibility of the Work Plan, the number and skill sets of personnel to be committed by the vendor; and the project schedule. Evaluation will also include vendor's ability to demonstrate delivering systems of similar type and scope, following the system engineering process described in Section 3 above, and quality/completeness of corresponding documentation elements. This section is intended to clearly explain how the Vendor will execute the project, identify the critical path elements and responsibility for each element and the expectations the Vendor has for DelDOT's role in the execution of the project. Vendor's approach to on-going maintenance support will be evaluated as a part of the scoring in this section.

DBE Participation

This section shall be scored based on a number of factors including, but not limited to; confirmation of a DBE firm certified by and through the DelDOT DBE Program, level of participation as a percentage of the overall project, type of role the DBE firm will be performing with higher scores for roles spread throughout the project tasks,

feasibility of proposed DBE participation approach, and demonstrated previous working relationship on similar technically oriented projects.

Expansion Capability

This section shall address each vendor's proposed approach to providing a system that can expand in terms of call capacity and features. The evaluation will consider overall expansion without hardware modifications, ease of integration with adjacent state's 511 systems and upgrade path support for future possible enhancements.

6.1.3 Scoring

Evaluation rating criteria shall be awarded at the sole discretion of the Selection Committee members.

6.1.4 Product Demonstration

The Department makes no guarantee on providing a specified period of notice, and Vendors should be prepared to provide Vendor demonstrations, if requested. Tentative dates and times are listed in Section 1.14. The Department may request specific information to be provided at the demonstration. Product demonstrations may be recorded.

6.1.5 Revised Proposals

After demonstrations, Vendors may be asked to amend their proposals to incorporate any requested changes identified in their proposal or during the demonstration. The Selection Committee will advise a date by which any revised proposals must be received. Failure to submit a revised proposal within that time period will cause the committee to evaluate the original proposal.

The Selection Committee will review revised proposals for understanding and completeness. The Committee may request answers to any questions from one or all Vendors.

Original proposals, including any revisions, will be considered with any Best and Final Offer from each Vendor participating.

6.2 Award

If the Department is not able to come to agreement with the selected Vendor, the Department will end discussions and begin discussions with the next highest selected Vendor who will then have the same opportunity to enter into a contract with the DelDOT.

Award of the contract will be announced upon successful execution of the contract. All Vendors submitting proposals will be advised.

6.3 Department Rights

The Department reserves the right to:

- Select for contract or for negotiations a proposal other than that with the lowest costs;
- Reject any and all proposals received in response to this RFP;
- Make no award;
- Issue a new RFP;
- Waive any informalities, irregularities, or inconsistency in proposals received;
- Request modification to proposals from any or all Vendors during the review and negotiation;
- Negotiate any aspect of the proposal with any firm and negotiate with more than one firm at the same time;
- Make partial awards;
- Increase or decrease quantities;
- Deny any and all exceptions to the RFP requirements;
- Reject any non-responsive or non-conforming proposals;
- Make any such award as is deemed to be in the best interest of the State of Delaware.

6.4 Disputes

In the event of any disputes during this procurement process, the SECRETARY of the Delaware Department of Transportation (or his/her designee) shall hear all arguments and render a final decision on the controversy that shall be binding on all parties concerned.

6.5 Source Code

In the event the Vendor ceases to maintain experienced staff and the resources needed to implement the system, or fulfill the requirements of this contract, the Department shall be entitled to have, use, and duplicate for its own use, a copy of the source code and associated documentation for the software products covered by the Contract. Until such time as a complete copy of such material is provided, the Department shall have exclusive right to possess all physical embodiments of such Vendor owned materials. The rights of the Department in this respect shall survive for a period of twenty (20) years after the expiration or termination of the Contract. All lease and royalty fees necessary to support this right are included in the initial fee as contained in the Price Proposal.

6.5.1 Contractor Source Code in Escrow

A software escrow account has been established by the Department and all Vendor developed software shall be placed in the established escrow account upon successful completion of the system acceptance test. A software escrow means deposit of the source code of the software into an account held by a third party escrow agent. It includes source code, make files, and documentation such that DelDOT could modify the source code base in the event the Vendor is unwilling or unable to support the delivered system. The escrow account shall be maintained and paid for by DelDOT.

The software source code is to be released to DeIDOT if the licensor files for bankruptcy or otherwise fails to maintain and update the software. The source code escrow agreement is attached as Appendix D for reference.

7. Applicable Documents

7.1 Reference Documents

All work performed and equipment supplied shall be in conformance with the following reference documents, codes and standards:

- Applicable DeIDOT Codes and Standards
- DeIDOT Manual of Uniform Traffic Control Devices (MUTCD)
- National Electric Safety Code,
- Occupational Safety and Health Act (OSHA),
- National Electrical Code (NEC)
- National Fire Protection Association (NFPA),
- National Electrical Manufacturers Association (NEMA),
- Electronic Industries Association (EIA) Standards for Interface and Underwriters Laboratories (UL)
- Federal Highway Administration, 511 implementation guidelines
- Section 508 of the Rehabilitation Act (29 U.S.C. 794d), as amended by the Workforce Investment Act of 1998 (P.L. 105-220), August 7, 1998
- Local building codes

8. Payment Milestones

The State of Delaware will require a payment schedule based on defined and measurable milestones. Payments for services will not be made in advance of work performed.

The project will be performed for a fixed price in accordance with the pricing section of this specification. The Vendor shall be paid based on successful completed and DeIDOT approved milestone elements as per the table below.

| MILESTONE | PAYMENT PERCENT |
|---|------------------------|
| Project Management Plan | 7% |
| System Architecture and Networking Plan | 5% |
| Power Audit Memorandum | 2% |
| Training Plan | 5% |
| Pre SAT SA Training | 3% |

| MILESTONE | PAYMENT PERCENT |
|---|------------------------|
| Post Observation Period SA Training | 3% |
| System Acceptance Test Plan | 5% |
| On-Site System Delivery and Set Up (System Ready for Training) | 20% |
| Successful Completion of System Acceptance Testing (including transit AVL data integration) | 30% |
| Successful Operational Test Period Completion (30 days) | 15% |
| System Documentation | 5% |

9. Cost Proposal

All contract costs must be as detailed specifically in the Vendor's cost proposal. The Vendor shall provide a fixed price cost for the scope of work defined in this RFP. No charges other than as specified in the proposal shall be allowed without written consent of the State of Delaware. The proposal costs shall include full compensation for all taxes that the selected vendor is required to pay.

The cost shall be provided in the following table format:

| Line # | Description | Cost |
|---------------|--|-------------|
| 1 | Project Management Plan | |
| 2 | System Architecture and Networking Plan | |
| 3 | Power Audit Memorandum | |
| 4 | Change Control Plan | |
| 5 | Training Plan | |
| 6 | Pre SAT SA Training | |
| 7 | Post Observation Period SA Training | |
| 8 | System Acceptance Test Plan | |
| 9 | On-Site System Delivery and Set Up (System Ready for Training) | |
| 10 | System Acceptance Testing | |
| 11 | Operational Test Period Support (30 days) | |
| 12 | System Documentation | |
| 13 | Spanish Language Support | |
| 14 | Subtotal | |
| | | |
| | Computer Hardware | |
| 15 | Servers & Racks to be provided by DelDOT (Attach Detailed List) | |
| 16 | Network gear | |
| 17 | Peripherals (backup drive, power distribution panels, etc) | |
| 18 | Miscellaneous Cables, connectors, labels, etc. | |
| | | |
| 19 | Hardware Subtotal | |
| | | |
| | Commercial Software | |
| 20 | COTS Software for 48 ports Text-to-Speech Servers supporting unlimited requests | |
| 21 | 3 Year Software Maintenance Cost for 48 Port Solution | |
| 22 | Software Subtotal | |
| | | |
| | System Maintenance Support | |
| 23 | 3 Year System Maintenance Support (cost for all 3 years) | |
| 24 | System Support Subtotal | |
| | | |
| | Project Cost | |
| | Lines 14 + 22 + 24 | |
| | Hardware Cost | |
| | Line 19 | |
| | | |
| | Total Implementation (Project Cost + Hardware Cost) | |

The system shall have the ability to fully support the Spanish language in the base system and be considered as part of the base solution. The cost provided in the “Project Cost” call out line item (Item #13) shall be used as the amount that shall be *deducted* in the event that DelDOT chooses not to include Spanish language support for budgetary reasons.

9.1 Pricing for Options (if any):

Vendor shall provide a fixed price cost and detailed description of any optional items that are offered above the base 511 system. Included in pricing options shall be the cost of expanding from 48 ports to 128 ports. The cost shall be provided in the following table format. Include a written technical description of any option with your submittal.

| Line # | Description | Cost |
|--------|--|------|
| O-1 | System & Software expansion cost to 128 Ports and labor required | |
| | 3 Year Maintenance Cost for 128 Port Solution | |
| O-2 | | |
| | | |
| O-3 | | |
| | | |
| O-4 | | |
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| O-5 | | |
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| O-6 | | |
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| O-7 | | |
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| O-8 | | |
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| O-9 | | |
| | | |
| O-10 | | |
| | | |

BID PROPOSAL FORMS

CONTRACT No. 1599

SUBMISSION FORM

Department of Transportation Request for Proposal 1599 – 511 Traveler Information System

Attention: Wendy B. Henry, Contract Administration
Delaware Department of Transportation
800 Bay Road
Dover, DE 19901

We have read Request for Proposal number 1599 and fully understand the intent of the proposal as stated, certify that we have adequate personnel and knowledge to fulfill the requirements thereof, and agree to furnish such services in accordance with the contract documents as indicated should we be awarded the contract.

Non-Collusion: Proposals are made without any previous understanding, contract, or with any person, firm, or corporation making a proposal for the same services, or supplies, or equipment, and is without collusion or fraud.

Date: _____ **Submitted By:** _____

Vendor Firm: _____

Address: _____

Designated Contact Person: _____

E-Mail: _____ **Phone No.:** _____

Signature of Vendor Authorized Person: _____

Title of Authorized Person: _____

Printed Name of Authorized Person: _____

Federal E.I. No.: _____

State of DE Business License No.: _____

**Proposer is a [state whether Sole Proprietor,
Partnership, Corporation, other]:** _____

CERTIFICATION
Request for Proposal No. 1599RA

The undersigned bidder _____ whose address is _____ and telephone number is _____
_____ hereby certifies the following:

I/We have carefully examined the Request for Proposal and will be bound, upon award of this contract by the Department of Transportation, to execute in accordance with such award, a contract to provide all services necessary, and to do all the work and to furnish all the services necessary to perform and complete the said contract within the time and as required in accordance with the requirements of the Department of Transportation, and at the unit prices for the various items as listed on the preceding pages.

The foregoing quantities are considered to be approximate only and are given as the basis for comparison of bids. The Department of Transportation may increase or decrease the amount of any item or portion of the work as may be deemed necessary or expedient. Any such increase or decrease in the quantity for any item will not be regarded as a sufficient ground for an increase or decrease in the unit prices, nor in the time allowed for the completion of the work, except as provided in the contract.

I/We are licensed, or have initiated the license application as required by Section 2502, Chapter 25, Title 30, of the Delaware Code.

By submission of this proposal, each Vendor and each person signing on behalf of any Vendor, certifies as to its own organization, under penalty of perjury, that to the best of each signer's knowledge and belief:

1. The prices in this proposal have been arrived at independently without collusion, consultation, communication, or agreement with any other Vendor or with any competitor for the purpose of restricting competition.
2. Unless required by law, the prices which have been quoted in this proposal have not been knowingly disclosed and will not knowingly be disclosed by the Vendor, directly or indirectly, to any other Vendor or competitor prior to the opening of proposals.
3. No attempt has been made or will be made by the Vendor to induce any other person, partnership, or corporation to submit or not to submit a proposal for the purpose of restricting competition.

I/We acknowledge receipt and incorporation of addenda to this proposal as follows:

Sealed and dated this _____ day of _____, 20____.

Name of Bidder (Organization)

Corporate
Seal

By:

Authorized Signature

Attest _____

Title

SWORN TO AND SUBSCRIBED

Notary
Seal

Notary

Appendix A

Definitions

Vendor – Party that submits a proposal in response to the solicitation
Issuing Office – DelDOT’s Contracting Department

Acronyms

The follow is a list of acronyms that are used within this document:

ATMS = Advanced Traffic Management System
CAD = Computer Aided Dispatch
CCTV = Closed Circuit TV
CD = Compact Disk
CMP = Change Management Plan
COTS = Commercial off the shelf
DBE = Disadvantage Business Enterprise
DMS = Dynamic message sign
DelDOT = Delaware Department of Transportation
ESB = Enterprise Service Bus
ITMS = (ATMS) Delaware’s Integrated Transportation Management System
DTC = Delaware Transit Corporation
EIA = Electronic Industries Association
FCC = Federal Communications Commission
FHWA = Federal Highway Administration
GUI = Graphical user interface
IEEE = Institute of Electrical and Electronic Engineers
MS = Microsoft
MOM = ESB Message-Oriented Middleware
MUTCD = Delaware’s Manual of Uniform Traffic Control Devices
NECA = National Electrical Contractors Association
NEMA = National Electrical Manufacturers Association
OIT = Office of Information Technology
OSHA = Occupational Safety and Health Act
PDF = Portable Document Format
PMP = Procurement Management Plan
RF = Radio Frequency
RMP = Risk Management Plan
RWIS = Road Weather Information System
TMC = Traffic Management Center (located in Smyrna, DE)
SOW = Scope of Work
UL = Underwriters Laboratories
WAV = Waveform Audio File Format (WAVE, or more commonly known as **WAV**)

Appendix B

**Technical
Specification
Document**

TMC Enterprise Service Bus Data Exchange

Delaware Department of Transportation

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2. GENERAL INFORMATION

This document covers the technical portions of the enterprise service bus (ESB) and its' supporting components used by DelDOT TMC. It is used to control the flow and integration of data that is managed by the TMC. The service(s) provide a mechanism by which other groups and projects within DelDOT can exchange standardized data in a controlled fashion.

This will allow external efforts besides the core TMC applications access to a pre-determined set of datasets in a real-time fashion.

2.1 Purpose

This document was created to describe the mechanism, the format and data that will be exchanged across the ESB. This document is not intended to explain how the end user/project is going to actually process the data, only what the mechanism is, how to use it and how to get and place data on the ESB.

It should also be noted that this interface document can and will change. This document in its current format should not be deemed final and 100% complete due to integration projects still being developed. The document exists in its current form so integration teams can better understand the scope and magnitude of the integration effort from both producer and consumer stand point. As integration efforts commence and formal final decisions are made the document will be updated to reflect the final decisions made by all consumers and producers leveraging the DelDOT TMC ESB.

2.2 Scope

This document will cover the following:

- Describe the Enterprise Service Bus (ESB).
- Outline the data that is passed via the ESB.
- Outline the format of the data that is passed via the ESB.
- Outline the states/actions related to data passed via the ESB.
- Mechanisms by which to communicate with the ESB.

2.3 References

- OASIS Consortium (<http://www.oasis-open.org/>)
- Emergency Data Exchange Language (EDXL) Distribution Element v1.0
http://docs.oasis-open.org/emergency/edxl-de/v1.0/EDXL-DE_Spec_v1.0.pdf
- Common Alerting Protocol (CAP) v1.2
<http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2-os.pdf>
- IEEE Std 1512-2006, IEEE Standard for Common Incident Management

- <http://standards.ieee.org/downloads/1512/1512-2006/>
IEEE Std 1512.1-2006, IEEE Standard for Common Traffic Incident Management
 - <http://standards.ieee.org/downloads/1512/1512.1-2006/>
IETF RFC 4648, Base-N Encodings Best Practice
- <http://tools.ietf.org/html/rfc4648>

2.4 Acronyms

| ACRONYM | DEFINITION |
|---------|---|
| CAP | Common Alerting Protocol |
| DelDOT | Delaware Department of Transportation |
| EDXL | Emergency Data Exchange |
| ESB | Enterprise Service Bus |
| IEEE | Institute of Electrical and Electronics Engineers |
| IETF | Internet Engineering Task Force |
| MOM | Message Oriented Middleware |
| MP3 | MPEG-1 or MPEG-2 Audio Layer III, more commonly referred to as MP3 audio file format. |
| OASIS | OASIS is a not-for-profit consortium that brings people together to agree on intelligent ways to exchange information over the Internet and within their organizations. |
| RTTA | Real Time Travel Alerts (Incidents) |
| RWIS | Road Weather Information System (TMC Weather Stations) |
| STR | Scheduled Travel Restrictions |
| TMC | Traffic Management Center |
| WAV | Waveform Audio File Format (WAVE, or more commonly known as WAV due to its filename extension) |
| XML | Extensible Markup Language |

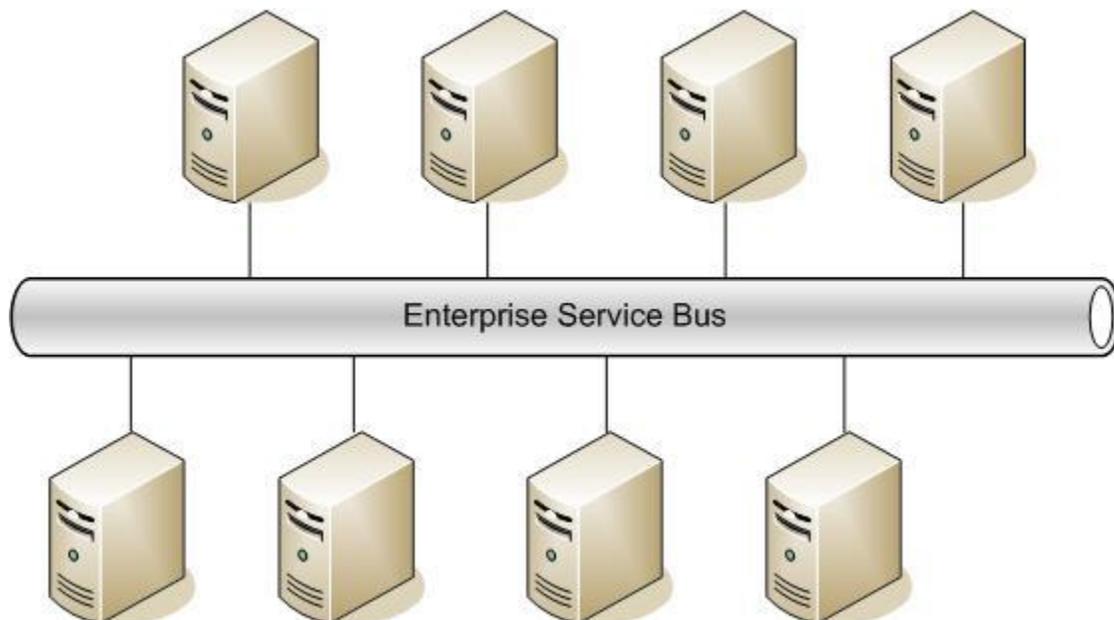
3. ESB OVERVIEW

What is the Enterprise Service Bus (ESB)?

The ESB is a software architecture that DelDOT TMC has adopted for designing and implementing the communicating and exchanging of data between custom software.

The ESB promotes the use of data exchange via asynchronous messaging via a Message Oriented Middleware (MOM). Messages in the form of XML are placed within the MOM framework which manages the message processing of the interested parties (in this case custom software integration).

The general design is not point to point connections amongst different systems, but a central bus that allows for interchange of data for the systems that subscribe to data and have permissions to receive the data.

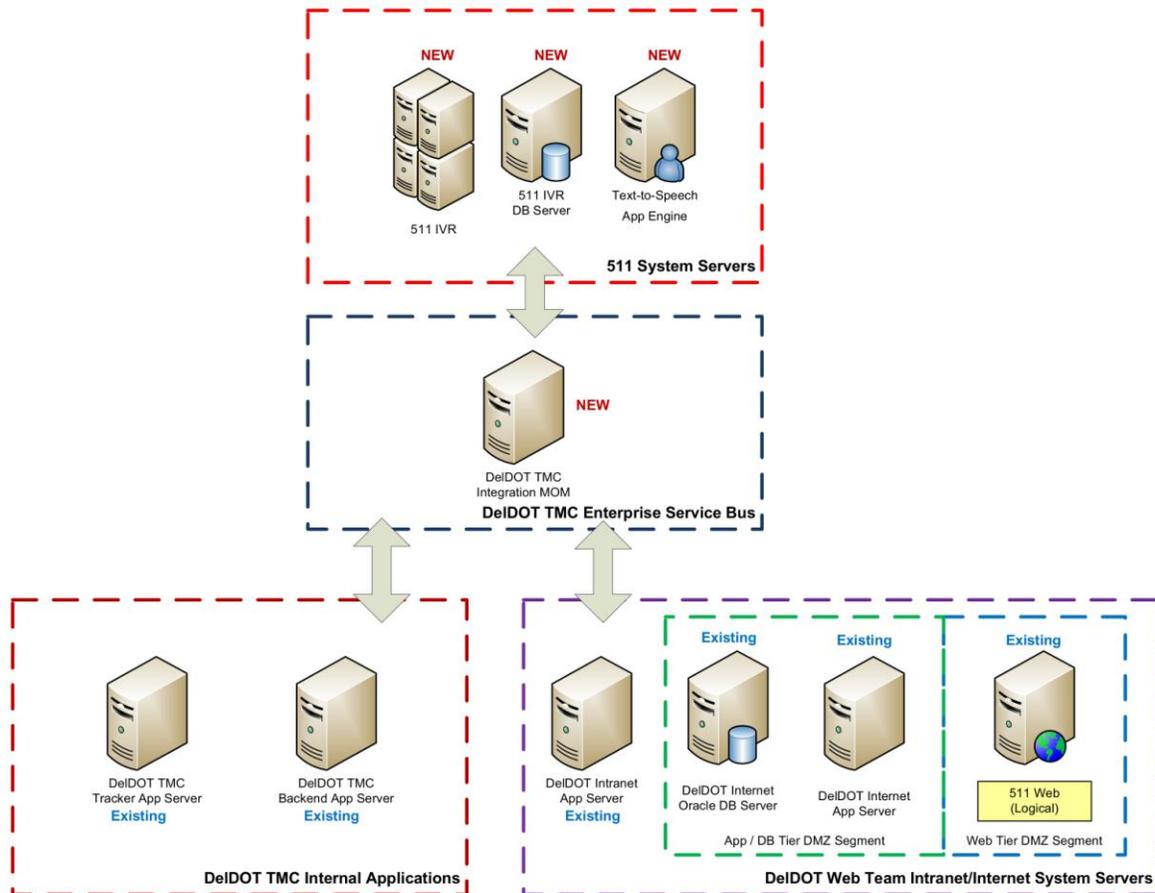


4. DELDOT TMC IMPLEMENTATION

DelDOT TMC implementation of the ESB allows for data exchange between several key DelDOT entities. Diagrams and detailed information of the systems currently or projected to be interacting with the ESB are subject to change. Changes and enhancements to the ESB will occur as more demand and more data types are exchanged, and so will the details outlining those implementations.

4.1 TMC ESB Design

The following diagram shows the DelDOT ESB located in the middle and the systems putting data onto the bus (DelDOT TMC Internal Applications) and those consuming that data (511 System and Web Team system). Instead of building many point to point brittle integration points, the ESB acts as the new clearing house for all data between these separate systems. As demand and load requires it, the ESB can be scaled out by adding additional nodes as needed. This also removes the need for other systems to have knowledge of other producing or consuming actual physical systems. Instead the data is kept at a logical instead of physical layer.



4.2 Messaging Infrastructure

The ESB main infrastructure is Apache ActiveMQ Message Oriented Middleware (MOM). This is an open source standards based messaging middleware. ActiveMQ supports numerous Cross Language Clients and Protocols allowing for greater integration flexibility and extensibility.

As the time this document was created ActiveMQ v5.5 supported the following Language Clients:

- Java via Full JMS 1.2 Client
- [ActionScript 3](#)
- [Ajax](#)
- [C](#)
- [C++](#)
- [C# and .Net](#)
- [Delphi](#) and [Delphi/FreePascal](#)
- [Erlang](#)

- [Flash / ActionScript](#)
- [Haskell](#)
- JavaScript - [Ajax](#) or [WebSockets](#)
- [Perl](#)
- [PHP](#)
- [Pike](#)
- [Python](#)
- [Ruby](#) and Rails support via [ActiveMessaging](#)
- [Smalltalk](#)
- [WebSockets](#)

4.3 Messaging Message Wire Formats

Before looking at the details of the data messages that will be transferred across the ESB, let's look at the type of message first. For greatest interoperability, the single message wire format will be of a Text Message format.

Text Message is as the name sounds, a message containing only text base content. At this time, it will be the sole message type traversing the ESB. This should allow for the greatest integration ease across all platform types. Removing the need for support of more complex message types and additional repositories (FTP or HTTP servers) adding unneeded complexity.

Text Message should contain valid XML markup and use the standards outlined in this document. Binary objects (audio files) should use standard Base64 encoding before being added to a content node in XML document (also outlined later in this document).

4.4 Message Category Types

TMC ESB publishes several categories of messages. Category of messages and Message wire formats should not be confused.

- Message Wire format is the mechanism in which they are published to the ESB.
- Message Category is a type of data message that will be passed within the Message Wire Text Message format.

The following is the list of category data types that are supported at the time of this documents creation:

- RTTA (Real Time Travel Advisories - Incidents)
- STR (Scheduled Travel Restrictions - Construction)
- Text To Speech Audio File Request and Response

Additional message category types will be added over time. Just because a new message categories are published to the bus does not mean all consumers on the bus will or required to

consume them. Some of the new message categories that will be added to the bus as development proceeds would be the following:

- Travel Times
- Press Releases
- Weather Station summaries

4.5 Message Data State

The message data state allows for coordination across all publishers and consumers of the message types. The state allows a publisher to convey what consumers of message should do with the message. Below is a list of those states:

| State | Description |
|----------|--|
| active | The message data is valid and active. The message data would actively be impacting the roadway. The data should be or presented as actively occurring in consuming system. |
| inactive | The message data is valid but not active. This would apply to STR only. Meaning an STR has been |
| expired | The message data has expired. The data should no longer be presented in consuming system. |
| erased | The message data has expired and data terminated. Data should be removed from the consuming system. |
| deleted | The message data has been removed from the source system without normal expiration. Data should be removed from the consuming system. |
| pending | The message is new and awaiting processing. This state is only used in the text to speech request messages. |
| success | The message is a response message to an original text to speech request messages. This state is only used in the text to speech response messages. |

4.6 Message Data State Transitions

Active vs. Inactive Initial States

Message data normally always starts in an active state (RTTA). The exception to this rule is STR's. They can be scheduled and currently not active and would have an inactive state declared.

These states do not apply to the text-to-speech message types.

Erased vs. Deleted Termination States

Message data will always terminate in one of two states: erased or deleted.

Erased is the termination state that will occur during normal event processing.

Deleted is the termination state that will occur in the event of a deleted to correct an error.

The following table lists the state transitions a message data can go through from one state to another and why/when/context that could occur during.

These states do not apply to the text-to-speech message types.

| Beginning State | Ending State | Description |
|-----------------|--------------|---|
| active | inactive | The technician has marked the STR as inactive and saved. |
| | expired | The system has marked the scheduled event as expired automatically without technician being involved. |
| | erased | The system or technician has marked the RTTA or STR as done. This is normal operation or removing RTTA and STR from the system. |
| | deleted | The technician has marked the RTTA or STR as being invalid. This is possibly due to an error. |
| inactive | active | The technician has marked the STR as active and saved. |
| | expired | The system has marked the STR as expired automatically without technician being involved. |
| | deleted | The technician has marked the STR as being invalid. This is possibly due to an error. |
| expired | erased | The system automatically marks STR as erased after predefined amount of time for expired STR's. |

4.7 Message Structure

Two XML data exchange standards are used in the exchange data sets related to incident / emergency management data sets (RTTA / STR). The following quickly describes those standards and samples of each standard. *Use the reference section at the front of this document for greater details on each of the standards used.*

EDXL-DE 1.0 Standard

The first standard from the OASIS group is called Emergency Data Exchange Language (EDXL) Distribution Element 1.0. The Distribution Element specification describes a standard message distribution framework for data sharing among emergency information systems.

EDXL-DE 1.0 Schema Standard

```
<?xml version="1.0" encoding="UTF-8"?>

<xsd:schema targetNamespace="http://niem.gov/niem/edxl/2.0" version="1"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:s="http://niem.gov/niem/structures/2.0"
xmlns:i="http://niem.gov/niem/appinfo/2.0" xmlns:edxl="http://niem.gov/niem/edxl/2.0">

  <xsd:annotation>

    <xsd:documentation>Emergency Data Exchange Language</xsd:documentation>

    <xsd:appinfo>

      <i:ConformantIndicator>true</i:ConformantIndicator>

    </xsd:appinfo>

  </xsd:annotation>

  <xsd:import schemaLocation="../../../structures/2.0/structures.xsd" namespace="http://niem.gov/niem/structures/2.0"/>

  <xsd:import schemaLocation="../../../appinfo/2.0/appinfo.xsd" namespace="http://niem.gov/niem/appinfo/2.0"/>

  <xsd:simpleType name="ContentCategoryCodeSimpleType">

    <xsd:annotation>

      <xsd:appinfo>

        <i:Base i:namespace="http://niem.gov/niem/structures/2.0" i:name="Object"/>

      </xsd:appinfo>

    </xsd:annotation>

    <xsd:restriction base="xsd:token">

      <xsd:enumeration value="Accept">

        <xsd:annotation>

          <xsd:documentation>In response to a resource message; "I'll get back to you with an answer one way or the other (could still result in a "decline")"</xsd:documentation>

        </xsd:annotation>

      </xsd:enumeration>

      <xsd:enumeration value="Acknowledge">
```

```
<xsd:annotation>

  <xsd:documentation>In response to any resource message, "I have received your message but have not yet processed
it"</xsd:documentation>

</xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Cancel">

  <xsd:annotation>

    <xsd:documentation>Message used to revoke any previous resource message. NOTE: This message may be used to "cancel"
or "recall" resource: Resource requested and perhaps en route, but no longer needed.</xsd:documentation>

  </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Commit Resource">

  <xsd:annotation>

    <xsd:documentation>Message used to agree or commit specific resource in response to a Resource Request or Requisition,
or to a "Request Return"</xsd:documentation>

  </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Decline">

  <xsd:annotation>

    <xsd:documentation>In response to a resource message; "I cannot meet your request"</xsd:documentation>

  </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Notify Auxiliary Recipients">

  <xsd:annotation>

    <xsd:documentation>Message used to advise or notify an auxiliary recipient (e.g. a government official) about any
resource message as an "FYI", where the auxiliary recipient was not included on original distribution.</xsd:documentation>

  </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Notify Resource Request Disposition">

  <xsd:annotation>

    <xsd:documentation>Message used to report on the current "status" of any resource in relation to a Resource
Requisition, Release Resource, or Request to Return Resource.</xsd:documentation>

  </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Offer Unsolicited Resources">

  <xsd:annotation>

    <xsd:documentation>Message used to offer available resources (that have not been requested) to assist with an emergency
response.</xsd:documentation>
```

```
</xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Release Resource">

  <xsd:annotation>

    <xsd:documentation>Message used by authorities at the incident to "release" (demobilize) resource back to its original
    point of assignment or to another location / assignment.</xsd:documentation>

  </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Request Extension">

  <xsd:annotation>

    <xsd:documentation>A request initiated by the requester / receiver of resource, "I want to extend how long I need to
    keep this resource"</xsd:documentation>

  </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Request Information (RFI)">

  <xsd:annotation>

    <xsd:documentation>Message used to ask resource questions or provide general description of situation and general
    resources needs.</xsd:documentation>

  </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Request Quote">

  <xsd:annotation>

    <xsd:documentation>Message used to request a price quote from a seller or supplier.</xsd:documentation>

  </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Request Resource">

  <xsd:annotation>

    <xsd:documentation>Message used to request needed resources from one or many recipients, possibly spawning multiple
    responses.</xsd:documentation>

  </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Request Resource Disposition">

  <xsd:annotation>

    <xsd:documentation>Message used to request current "status" of resource in relation to a previous Resource Requisition
    or Release Resource.</xsd:documentation>

  </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Request Return">
```

```
<xsd:annotation>

    <xsd:documentation>Message used to request release (demobilize) of resources back to its original point of assignment
    or to another location / assignment ("I want my stuff back").</xsd:documentation>

</xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Requisition Resource">

    <xsd:annotation>

        <xsd:documentation>Message used to "order" specific resource, or to confirm specific resource to be "ordered" relating
        to one or more responses to a "Request Resource".</xsd:documentation>

    </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Response to Offer Unsolicited Resources">

    <xsd:annotation>

        <xsd:documentation>Message used as the response to an offer of unsolicited resources, indicating accept or
        decline.</xsd:documentation>

    </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Response to Request Information (RFI)">

    <xsd:annotation>

        <xsd:documentation>Message used as the response to an RFI message providing general information or to list resource
        that may meet the specified need.</xsd:documentation>

    </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Response to Request Quote">

    <xsd:annotation>

        <xsd:documentation>Message used as the response to a "Request Quote". Allows sender to list resource(s) which they
        feel represent suitable match with the request, with pricing information.</xsd:documentation>

    </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Response to Request Resource">

    <xsd:annotation>

        <xsd:documentation>Message used as the response to a "Request Resource". Allows sender to list resource(s) which they
        feel represent suitable match with a resource request.</xsd:documentation>

    </xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Response to Request Return">

    <xsd:annotation>

        <xsd:documentation>Message used as the response to a "Request Return" indicating whether the resource may be released,
        with relevant time-line information.</xsd:documentation>

    </xsd:annotation>

</xsd:enumeration>
```

```
</xsd:annotation>

</xsd:enumeration>

<xsd:enumeration value="Update">

  <xsd:annotation>

    <xsd:documentation>Message used to provide information superseding a previously sent Resource Message (change/modify
one or more information elements of the message). Example: Change requested resource quantity.</xsd:documentation>

  </xsd:annotation>

</xsd:enumeration>

</xsd:restriction>

</xsd:simpleType>

<xsd:complexType name="ContentCategoryCodeType">

  <xsd:annotation>

    <xsd:appinfo>

      <i:Base i:namespace="http://niem.gov/niem/structures/2.0" i:name="Object"/>

    </xsd:appinfo>

  </xsd:annotation>

  <xsd:simpleContent>

    <xsd:extension base="edxl:ContentCategoryCodeSimpleType">

      <xsd:attributeGroup ref="s:SimpleObjectAttributeGroup"/>

    </xsd:extension>

  </xsd:simpleContent>

</xsd:complexType>

<xsd:simpleType name="ResponseCodeSimpleType">

  <xsd:annotation>

    <xsd:appinfo>

      <i:Base i:namespace="http://niem.gov/niem/structures/2.0" i:name="Object"/>

    </xsd:appinfo>

  </xsd:annotation>

  <xsd:restriction base="xsd:token">

    <xsd:enumeration value="Accept"/>

    <xsd:enumeration value="Decline"/>

  </xsd:restriction>

</xsd:simpleType>

<xsd:complexType name="ResponseCodeType">

  <xsd:annotation>
```

```
<xsd:appinfo>

  <i:Base i:namespace="http://niem.gov/niem/structures/2.0" i:name="Object"/>

</xsd:appinfo>

</xsd:annotation>

<xsd:simpleContent>

  <xsd:extension base="edxl:ResponseCodeSimpleType">

    <xsd:attributeGroup ref="s:SimpleObjectAttributeGroup"/>

  </xsd:extension>

</xsd:simpleContent>

</xsd:complexType>

</xsd:schema>
```

IEEE 1512 Incident Standard

The second major standard used by the TMC data exchange interface is from the IEEE. The IEEE 1512 family of standards is used to specify the precise format, data element order, and transactional order of incident management messages passing between agencies that participate in an incident response.

IEEE 1512 Incident Standard Example XML

The following is an example of a standard IEEE 1512 xml document might look like:

```
<?xml version="1.0"?>

<!-- IEEE 1512 Incident Description Positive Test Case -->

<tns:incidentDescription xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://www.imguide.com" xsi:schemaLocation="http://www.imguide.com/IEEE1512/IEEE1512.xsd" />

  <header>

    <senderIncidentID>A0123456</senderIncidentID>

  <basics>

    <incidentLoc>

      <geoCoord>

        <geoLocationPoint>

          <latitude>4130000</latitude>

          <longitude>-7140000</longitude>

        </geoLocationPoint>

      </geoCoord>

    <address>
```

```
<addressPoint>
  <structureNumber>100</structureNumber>
  <streetInfo>
    <prefix>E</prefix>
    <name>45th Street</name>
    <suffix>St</suffix>
  </streetInfo>
  <adminAreas>
    <city>New York</city>
    <county>New York</county>
    <state>NY</state>
    <postalCode>10010</postalCode>
    <countryCode>001</countryCode>
    <stateFIPS>36</stateFIPS>
    <countyFIPS>36061</countyFIPS>
  </adminAreas>
</addressPoint>
</address>
<crossStreets>
  <crossStreetsPoint>
    <onStreetInfo>
      <prefix>E</prefix>
      <name>45th Street</name>
      <suffix>St</suffix>
    </onStreetInfo>
    <atStreetInfo>
      <prefix></prefix>
      <name>Madison</name>
      <suffix>Ave</suffix>
    </atStreetInfo>
  </crossStreetsPoint>
</crossStreets>
</incidentLoc>
<estimate1>
```

```
<percent>100</percent>

</estimate1>

<typeEvent>

  <accidentsAndIncidents>multi vehicle

    accident

  </accidentsAndIncidents>

</typeEvent>

</basics>

<issueTime>

  <timePoint>2002-05-30T09:00:30</timePoint>

  <count>3</count>

  <issueType>update</issueType>

</issueTime>

</header>

<idxSubParts>

  <timeMarks>

    <timeMark>

      <timePoint>2002-05-30T09:00:00</timePoint>

      <meaning>initialReport</meaning>

    </timeMark>

    <timeMark>

      <timePoint>2002-05-30T09:05:30</timePoint>

      <meaning>confirmTime</meaning>

    </timeMark>

    <timeMark>

      <timePoint>2002-05-30T09:11:05</timePoint>

      <meaning>clearedTime</meaning>

    </timeMark>

    <timeMark>

      <timePoint>2002-05-30T09:13:30</timePoint>

      <meaning>incidentClosed</meaning>

    </timeMark>

  </timeMarks>

  <descriptionReports>
```

```
<descriptionReport>
  <header>
    <senderIncidentID>A0123456</senderIncidentID>
  </header>
  <typeEvent>
    <accidentsAndIncidents>multi vehicle accident
  </accidentsAndIncidents>
  </typeEvent>
  <subject>Manhattan Borough. Multi vehicle accident at 45th
    Street St and Madison Ave. 2 of 4 lanes affected.
  </subject>
  <qual>
    <percent>80</percent>
  </qual>
</descriptionReport>
</descriptionReports>
<impactReports>
  <impactReport>
    Guide for Implementing IEEE 1512 Using a Systems Engineering Process
  <header>
    <senderIncidentID>A0123456</senderIncidentID>
  </header>
  <lanes>
    <lane>
      <lanesAffected>2</lanesAffected>
      <laneCnt>4</laneCnt>
    </lane>
  </lanes>
</impactReport>
</impactReports>
</idxSubParts>
</tns:incidentDescription>
```

Combination of Standards

For the exchange of our two incident management message types (RTTA and STR), the combination of both the EDXL-DE and IEEE 1512 standard is used. In the following two sections you will see two examples (one for RTTA and one for STR) of the implementation of these two standards into one XML document.

RTTA Message Example

The first of two incident management message types is the RTTA (Incident) based message. The following is an example of what an RTTA XML message would look like:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns3:EDXLDistribution xmlns:ns2="http://www.IM-Draft-03-00-44a"
                    xmlns:ns3="urn:oasis:names:tc:emergency:EDXL:DE:1.0">
  <ns3:distributionID>TRK20111110.0011</ns3:distributionID>
  <ns3:dateTimeSent>2011-11-10T12:01:01-05:00</ns3:dateTimeSent>
  <ns3:distributionStatus>Actual</ns3:distributionStatus>
  <ns3:language>en</ns3:language>
  <ns3:contentObject>
    <ns3:xmlContent>
      <ns3:keyXMLContent/>
      <ns3:embeddedXMLContent>
        <ns2:incidentDescription>
          <ns2:distribute>
            <ns2:from>
              <!-- sender will always be the same -->
              <ns2:endPoint>TMC-APP</ns2:endPoint>
              <ns2:centerID>TMC-APP</ns2:centerID>
            </ns2:from>
            <ns2:to>
              <ns2:to-item>
                <!-- this item should go to IVR -->
                <ns2:endPoint>IVR</ns2:endPoint>
                <ns2:centerID>IVR</ns2:centerID>
              </ns2:to-item>
            </ns2:to>
          </ns2:distribute>
        </ns2:incidentDescription>
      </ns3:embeddedXMLContent>
    </ns3:xmlContent>
  </ns3:contentObject>
</ns3:EDXLDistribution>
```

```
<ns2:to-item>

  <!-- this item should go to DelDOT web -->

  <ns2:endPoint>WEB-INTERNET</ns2:endPoint>

  <ns2:centerID>WEB-INTERNET</ns2:centerID>

</ns2:to-item>

</ns2:to>

<ns2:reference>TRK20111110.0011</ns2:reference>

</ns2:distribute>

<ns2:header>

  <ns2:senderIncidentID>TRK20111110.0011</ns2:senderIncidentID>

  <ns2:basics>

    <ns2:incidentLoc>

      <routeLocation>

        <linkLocation>

          <!-- Common name of the route the incident is on -->

          <linkName>CEDAR LANE ROAD</linkName>

          <linkEndpoints>

            <startLocation>

              <pointName>MARL PIT ROAD</pointName>

              <pointNodeId>

                <!--

                the type of feature defining this point one of the

                following (currently) BRIDGE_POINT CULTURAL

                INTERSECTION MILEPOST

                -->

                <intOrAlpha>

                  <idAlpha>INTESECTION</idAlpha>

                </intOrAlpha>

                <databaseID>111</databaseID>

              </pointNodeId>

            <geoLocationPoint>

              <latitude>3946429422</latitude>

              <longitude>-7571313858</longitude>

            </geoLocationPoint>

          </linkEndpoints>

        </linkLocation>

      </routeLocation>

    </ns2:incidentLoc>

  </ns2:basics>

</ns2:header>
```

```
</startLocation>

<endLocation>

  <pointName>BROAD STREET</pointName>

  <pointNodeId>

    <intOrAlpha>

      <idAlpha>INTESECTION</idAlpha>

    </intOrAlpha>

    <databaseID>999</databaseID>

  </pointNodeId>

  <geoLocationPoint>

    <latitude>3908379180</latitude>

    <longitude> -7551602840</longitude>

  </geoLocationPoint>

</endLocation>

</linkEndpoints>

</linkLocation>

</routeLocation>

<!--
primary direction impacted (see impacts below to determine if
both directions are affected
-->

<linearReference>

  <lateralOffsetRef>centerline</lateralOffsetRef>

  <travelDirection>South</travelDirection>

</linearReference>

<preCoded>

  <!-- DelDOT County Location Name-->

  <locationName>New Castle</locationName>

</preCoded>

</ns2:incidentLoc>

<ns2:typeEvent>

  <roadwork>work on underground services</roadwork>

</ns2:typeEvent>

<ns2:status>active</ns2:status>
```

```
</ns2:basics>

<ns2:issueTime>

  <!-- time this update was issued -->

  <ns2:timePoint>2011-11-10T12:01:01-05:00</ns2:timePoint>

  <ns2:count>2</ns2:count>

</ns2:issueTime>

</ns2:header>

<ns2:idxSubParts>

  <ns2:timeMarks>

    <ns2:timeMark>

      <ns2:timePoint>2011-11-10T12:05:01-05:00</ns2:timePoint>

      <ns2:meaning>confirmTime</ns2:meaning>

    </ns2:timeMark>

    <ns2:timeMark>

      <ns2:timePoint>2011-11-10T17:13:01-05:00</ns2:timePoint>

      <ns2:meaning>clearedTime</ns2:meaning>

    </ns2:timeMark>

  </ns2:timeMarks>

  <ns2:descriptionReports>

    <ns2:descriptionReport>

      <ns2:header>

        <ns2:senderIncidentID>TRK20111110.0011</ns2:senderIncidentID>

      </ns2:header>

      <ns2:typeEvent>

        <roadwork>work on underground services</roadwork>

      </ns2:typeEvent>

      <ns2:subject>Expected to clear by 5PM</ns2:subject>

      <ns2:localDescription>

        <locationDisplay>

          <miles>1.0</miles>

          <direction>S</direction>

          <landmark>Cedar Lane Road</landmark>

        </locationDisplay>

      </ns2:localDescription>

    </ns2:descriptionReport>

  </ns2:descriptionReports>

</ns2:idxSubParts>

</ns2:header>

</ns2:basics>
```

```
</ns2:descriptionReport>
</ns2:descriptionReports>
<ns2:impactReports>
  <ns2:impactReport>
    <ns2:header>
      <ns2:senderIncidentID>INC017651</ns2:senderIncidentID>
    </ns2:header>
    <ns2:lanes>
      <ns2:lane/>
    </ns2:lanes>
  </ns2:impactReport>
</ns2:impactReports>
<ns2:networkConditionsReports>
  <ns2:networkConditionsReport>
    <ns2:header>
      <ns2:senderIncidentID>TRK20111110.0011</ns2:senderIncidentID>
    </ns2:header>
    <ns2:bundledATIS>
      <ns2:incidents>
        <ns2:incident>
          <typeEvent>
            <roadwork>work on underground services</roadwork>
          </typeEvent>
          <localIncidentInformation>
            <!-- 511 message (all phrases) -->
            <obstructions>
              <obstruction>Pipe repair</obstruction>
            </obstructions>
            <closures>
              <closure>Closed until 5PM today</closure>
            </closures>
            <warnings>
              <warning>Please follow posted detours</warning>
              <warning>Expect Delays</warning>
            </warnings>
          </localIncidentInformation>
        </ns2:incident>
      </ns2:incidents>
    </ns2:bundledATIS>
  </ns2:networkConditionsReport>
</ns2:networkConditionsReports>
```

```
</warnings>
</localIncidentInformation>
</ns2:incident>
</ns2:incidents>
</ns2:bundledATIS>
</ns2:networkConditionsReport>
</ns2:networkConditionsReports>
</ns2:idxSubParts>
</ns2:incidentDescription>
</ns3:embeddedXMLContent>
</ns3:xmlContent>
</ns3:contentObject>
</ns3:EDXLDistribution>
```

STR Message Example

The second of two incident management message types is the STR (Scheduled) based message. The following is an example of what an STR XML message would look like:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns3:EDXLDistribution xmlns:ns2="http://www.IM-Draft-03-00-44a"
  xmlns:ns3="urn:oasis:names:tc:emergency:EDXL:DE:1.0" xmlns:ns4="http://www.ATIS-Draft-03-00-79">
  <ns3:distributionID>STR0039342</ns3:distributionID>
  <ns3:dateTimeSent>2011-11-10T16:11:11-05:00</ns3:dateTimeSent>
  <ns3:distributionStatus>Actual</ns3:distributionStatus>
  <ns3:language>en</ns3:language>
  <ns3:contentObject>
  <ns3:xmlContent>
    <ns3:keyXMLContent/>
    <ns3:embeddedXMLContent>
      <ns2:incidentDescription>
        <ns2:distribute>
          <ns2:from>
            <!-- sender will always be the same -->
            <ns2:endPoint>511</ns2:endPoint>
            <ns2:centerID>511</ns2:centerID>
          </ns2:from>
          <ns2:to>
            <ns2:to-item>
              <!-- this item should go to IVR -->
              <ns2:endPoint>IVR</ns2:endPoint>
              <ns2:centerID>IVR</ns2:centerID>
            </ns2:to-item>
            <ns2:to-item>
              <!-- this item should go to DelDOT Website -->
              <ns2:endPoint>WEB-INTERNET</ns2:endPoint>
              <ns2:centerID>WEB-INTERNET</ns2:centerID>
            </ns2:to-item>
          </ns2:to>
        </ns2:distribute>
      </ns2:incidentDescription>
    </ns3:embeddedXMLContent>
  </ns3:xmlContent>
</ns3:contentObject>
</ns3:distribution>
</ns3:EDXLDistribution>
```

```
</ns2:to>

<!-- Unique event id -->

<ns2:reference>STR0039342</ns2:reference>

</ns2:distribute>

<ns2:header>

<!-- Unique event id -->

<ns2:senderIncidentID>STR0039342</ns2:senderIncidentID>

<ns2:basics>

  <ns2:incidentLoc>

    <!-- DOT County name -->

    <preCoded>

      <locationName>Kent</locationName>

    </preCoded>

  </ns2:incidentLoc>

  <ns2:typeEvent>

    <roadwork>storm drain</roadwork>

  </ns2:typeEvent>

  <ns2:status>active</ns2:status>

</ns2:basics>

<ns2:issueTime>

  <ns2:timePoint>2011-11-10T16:11:11-05:00</ns2:timePoint>

  <ns2:count>0</ns2:count>

</ns2:issueTime>

</ns2:header>

<ns2:idxSubParts>

  <ns2:timeMarks>

    <ns2:timeMark>

      <ns2:timePoint>2011-11-10T12:00:00-05:00</ns2:timePoint>

      <ns2:meaning>scheduledStartTime</ns2:meaning>

    </ns2:timeMark>

    <ns2:timeMark>

      <ns2:timePoint>2011-11-10T13:00:00-05:00</ns2:timePoint>

      <ns2:meaning>workingStartTime</ns2:meaning>

    </ns2:timeMark>

  </ns2:timeMarks>

</ns2:idxSubParts>

</ns2:idxSubParts>
```

```
<ns2:timeMark>

  <ns2:timePoint>2011-11-10T17:00:00-05:00</ns2:timePoint>

  <ns2:meaning>scheduledStopTime</ns2:meaning>

</ns2:timeMark>

<ns2:timeMark>

  <ns2:timePoint>2011-11-10T16:30:00-05:00</ns2:timePoint>

  <ns2:meaning>workingStopTime</ns2:meaning>

</ns2:timeMark>

</ns2:timeMarks>

<ns2:descriptionReports>

  <ns2:descriptionReport>

    <ns2:header>

      <ns2:senderIncidentID>STR0039342</ns2:senderIncidentID>

    </ns2:header>

    <ns2:typeEvent>

      <roadwork>storm drain</roadwork>

    </ns2:typeEvent>

    <!--

    public 511 message - free text entered by operator - note that schema technically limits this to 500 chars

    -->

    <ns2:subject>Road will be closed during daylight, please use detour routes</ns2:subject>

    <ns2:localDescription>

      <messageFlags>

        <times>true</times>

        <start>true</start>

        <days>true</days>

      </messageFlags>

    </ns2:localDescription>

  </ns2:descriptionReport>

</ns2:descriptionReports>

<ns2:impactReports>

  <ns2:impactReport>

    <ns2:header>

      <ns2:senderIncidentID>STR0039342</ns2:senderIncidentID>
```

```
</ns2:header>

<ns2:lanes>

  <ns2:lane>

    <ns2:lanesAffected>1</ns2:lanesAffected>

    <ns2:laneCnt>1</ns2:laneCnt>

    <ns2:types>

      <ns2:type>road</ns2:type>

      <ns2:type>shoulder</ns2:type>

    </ns2:types>

    <ns2:location>South</ns2:location>

    <ns2:condition>closed</ns2:condition>

  </ns2:lane>

</ns2:lanes>

</ns2:impactReport>

</ns2:impactReports>

<ns2:networkConditionsReports>

  <ns2:networkConditionsReport>

    <ns2:header>

      <ns2:senderIncidentID>STR0039342</ns2:senderIncidentID>

    </ns2:header>

    <ns2:bundledATIS>

      <ns2:events>

        <ns2:event>

          <location>

            <routeLocation>

              <linkLocation>

                <linkName>Peachtree Run</linkName>

                <linkEndpoints>

                  <!-- starting point of the event -->

                  <startLocation>

                    <pointName>Lochmeath Way</pointName>

                    <pointNodeId>

                      <intOrAlpha>

                        <idAlpha>INTESECTION</idAlpha>
```

```
</intOrAlpha>

<databaseID>1111</databaseID>

</pointNodeId>

<geoLocationPoint>

  <latitude>3906234897</latitude>

  <longitude>-7553259373</longitude>

</geoLocationPoint>

</startLocation>

<!-- ending point of the event -->

<endLocation>

  <pointName>Walnut Shade Road</pointName>

  <pointNodeId>

    <intOrAlpha>

      <idAlpha>INTESECTION</idAlpha>

    </intOrAlpha>

    <databaseID>3421</databaseID>

  </pointNodeId>

  <geoLocationPoint>

    <latitude>3915339273</latitude>

    <longitude>-7551379681</longitude>

  </geoLocationPoint>

</endLocation>

</linkEndpoints>

</linkLocation>

</routeLocation>

<linearReference>

  <lateralOffsetRef>centerline</lateralOffsetRef>

  <travelDirection>South</travelDirection>

</linearReference>

</location>

<typeEvent>

  <roadwork>Bridge Inspections</roadwork>

</typeEvent>

<localEventInformation>
```

```
< closuresAndDelays >
  < closureOrDelay > Road Closure < / closureOrDelay >
  < closureOrDelay > Closed Daily < / closureOrDelay >
< / closuresAndDelays >

< warnings >
  < warning > Follow Posted Detours < / warning >
< / warnings >

< dayValues > MTWTFSU < / dayValues >

< untilValue > through the season < / untilValue >

< / localEventInformation >

< / ns2: event >

< / ns2: events >

< / ns2: bundledATIS >

< / ns2: networkConditionsReport >

< / ns2: networkConditionsReports >

< / ns2: idxSubParts >

< / ns2: incidentDescription >

< / ns3: embeddedXMLContent >

< / ns3: xmlContent >

< / ns3: contentObject >

< / ns3: EDXLDistribution >
```

5. COMMON EVENT ELEMENTS

The following is a list and explanation of common XML elements within the previous sections message examples.

5.1 Locations

All locations are defined used a routeLocation tag. A routeLocation has the following child elements:

- linkLocation
 - Required
 - Contains all location information

The linkLocation element contains the following child elements:

- linkName
 - Optional
 - Common name of route
- linkEndpoints
 - Required
 - Contains the starting and ending lat/lon for the location
- linkId
 - Optional
 - Agreed upon unique spatial dataset identifier for the roadway
- linkType
 - Required
 - Classification of the roadway location represents. Values might indicate Interstate, US route, State route, local roads, other

The linkEndpoints tag contains the following child elements:

- startLocation
 - Required
 - Contains details about starting point
- endLocation
 - Required
 - Contains details about ending point

The linkId tag contains the following child elements:

- spatialId
 - Required
 - Contains the spatial feature type which defines this location
- databaseId
 - Required
 - Contains the database ID for this route

The startLocation and endLocation tags contain the following children elements:

- pointNodeId
 - Optional
 - The unique GIS database identifier for the point.
- pointName
 - Required in startLocation, will not appear in endLocation if the operator only selected a single point
 - If the point was predefined then it is the name of the point (Milepost 52, High Water Bridge, etc.); if the point was not predefined then this value is free text that the operator typed in describing the point
- geoLocationPoint
 - Required in startLocation, will not appear in endLocation if the operator only selected a single point for the event
 - Points are described using a consistent EPSG.

The pointNodeId tag contains the following child elements:

- spatialId
 - Required
 - Contains the spatial feature type which defines this location
- databaseId
 - Required
 - Contains the database ID for this route

The geoLocationPoint tag contains the following child elements:

- Latitude
 - Required
 - The latitude in degrees for this point. The latitude is multiplied by 100000000 and any non-integer part of the result is truncated.
- Longitude
 - Required
 - The longitude in degrees for this point. The longitude is multiplied by 100000000 and any non-integer part of the result is truncated.

5.2 Header

The header tag contains general information about the event. The header tag contains the following child elements:

- senderIncidentID
 - Required
 - Unique identifier for the event
- Basics
 - Required
 - Common information for the event
- issueTime
 - Required
 - Information about this specific update to the event

The issueTime tag contains the following child elements:

- timePoint
 - Required
 - Date and time this update was published
- count
 - Required
 - Ordinal number of this update. The initial message for an event has count = 1
- issueType
 - Required
 - 'create' if this is the first message for the event, 'update' otherwise

The basics tag contains the following child elements:

- incidentLoc
 - Required
 - Information on the location of the event. Contents depend on event type
- typeEvent
 - Required
 - Describes the type of event
- severity
 - Optional
 - Describes the severity of the event
- status
 - Required
 - Describes whether the event is active. Possible values are:
 - 'active' for active events which should be displayed on 511
 - 'inactive' for inactive events which should not be displayed on 511
 - 'expired' for events which have expired
 - 'erased' for events which have been erased from the system
 - 'deleted' for events which have been deleted from the system

The incidentLoc tag contains the following child elements:

- routeLocation
 - Required (Incidents only)
 - Information on the location of the event
- linearReference
 - Required (Incidents only)
 - Describes primary direction of the event
- preCoded
 - Required
 - Describes DeIDOT County

The preCoded tag contains the following child elements:

- locationName
 - Required
 - DOT District name. Possible values are defined locally

The linearReference tag contains the following child elements:

- lateralOffsetRef
 - Required
 - Required by schema. No real meaning
- travelDirection
 - Required
 - Primary direction of the event impacts. Possible values are compass points
- side
 - Optional (present only if the event impacts travel in both directions)
 - Will always contain the text “both”

The typeEvent tag contains one of following child elements:

- accidentsAndIncidents
 - Required (RTTA only)
 - Local values describing event type
- roadwork
 - Required (STR only)
 - Local values describing work type.

5.3 Description Reports

Contains descriptive information about the RTTA/STR event.

The escriptionReport tag contains the following child elements:

- header
 - Required
 - Required by schema. No new information here
- typeEvent
 - Required
 - Required by schema. No new information here
- subject
 - Optional
 - Operator entered free text to be appended to the end of the message
- description
 - Optional (note contents are within a text tag)
 - DOT internal text for this event
- localDescription
 - Optional
 - 1512 extensions with local description

The local Description tag contains the following child elements:

- delayImpact
 - Optional
 - Estimates of delay impacts
- locationDisplay
 - Optional (present if the operator overrode the default location description for the message)
 - Location description details
- messageFlags

- Optional (STR only)
- Flags for STR event message options.

The delayImpact tag contains the following child elements:

- delayType
 - Optional
 - Values “major” or “minor”
- delayMiles
 - Optional
 - Real valued number

The locationDisplay tag contains the following child elements:

- miles
 - Required
 - Real valued number
- direction
 - Required
 - Compass point
- landmark
 - Required
 - One of the predefined location description landmarks. Possible values determined locally

The msgFlags tag contains the following child elements:

- times
 - Required
 - True if start and end times should be included in STR message. Should be False otherwise
- start
 - Required
 - True if start date should be included in STR message. Should be False otherwise
- days
 - Required
 - True if days of the week should be included in STR message. Should be False otherwise

5.4 Distribution

Describes which systems should respond to the message.

The distribute tag contains the following child elements.

- from
 - Required
 - Sender – will always be the same
- to
 - Required
 - List of systems which should read the message. Each recipient is described in a to-item tag
- reference
 - Required
 - Unique identifier of the event

Both from and to-item tags contain the following child elements:

- endpoint
 - Required
 - Name of the subsystem (same as value in centerID)
- centerID
 - Required
 - Name of the subsystem (same as value in endPoint)

The labels used to describe subsystems are listed in the table below:

| Subsystem | Description |
|--------------|---|
| ALL | Denotes any consumer endpoint (not limited to specific recipient) |
| IVR | Denotes the IVR system |
| TMC-APP | Denotes sourced from one of the application systems at the TMC |
| TMC-EXTRANET | Denotes the TMC Extranet system |
| WEB-INTRANET | Denotes the DelDOT Intranet |
| WEB-INTERNET | Denotes the DelDOT Public website |

5.5 Timemarks

The timeMarks tag contains any number of timeMark tags. The timeMark tag contains the following child elements:

- timePoint
 - Required
 - Date and time for the given timepoint
- meaning
 - Required
 - Describes meaning of the time mark. See below for interpretation

TimeMark meanings:

- confirmTime – (RTTA only) the start time entered
- clearedTime – (RTTA only) the end time entered
- workingStartTime – (STR only) the start time entered
- workingStopTime – (STR only) the stop time entered
- scheduledStartTime – (STR only) the start date entered
- scheduledStopTime – (STR only) the stop date entered

5.6 RTTA - Incidents

The incident tag is nested inside the networkConditionsReport/bundledATIS/incidents tags and contains the following child elements:

- location
 - Required
 - Required by schema. Empty tag
- typeEvent
 - Required
 - Required by schema. No new information here
- localIncidentInformation
 - Optional
 - 1512 extensions with local description

The localIncidentInformation tag contains the following child elements:

- obstructions
 - Optional
 - Contains some number of nested obstruction tags. Possible values are defined locally. These are the phrases that can be included in a public message

- closures
 - Optional
 - Contains some number of nested closure tags. Possible values are defined locally. These are the phrases that can be included in a public message
- warnings
 - Optional
 - Contains some number of nested warning tags. Possible values are defined locally. These are the phrases that can be included in a public message

5.7 STR - Scheduled

The event tag is nested inside the networkConditionsReport/bundledATIS/events tags and contains the following child elements:

- location
 - Required
 - Contains a routeLocation and linearReference tag containing segment location information
- typeEvent
 - Required
 - Required by schema. No new information here
- furtherData
 - Optional
 - URL for planned event project website
- localEventInformation
 - Required
 - 1512 extensions with local event information

The localEventInformation tag contains the following child elements:

- closuresAndDelays
 - Optional
 - Contains some number of nested closureOrDelay tags. Possible values are defined locally. These are the phrases that can be included in a public message
- warnings
 - Optional
 - Contains some number of nested warning tags. Possible values are defined locally. These are the phrases that can be included in a public message
- restrictions
 - Optional
 - Contains some number of nested restriction tags. Possible values are defined locally. These are the phrases that can be included in a public message
- dayValues
 - Optional
 - A string containing one letter abbreviations for the days of the week on which the project is active. If a project is active every day of the week then the contents would be 'MTWHFSU'
- untilValue
 - Optional
 - The text for the message which describes the end date of the planned event

5.8 EDXL Distribution Tags

The EDXLDistribution tag contains the following child elements:

- distributionID
 - Required
 - This is the unique identifier for the event
- dateTimeSent
 - Required
 - Timestamp from when this version of the event was issued
- distributionStatus
 - Required
 - States whether this event is a real event or not. Consumers should only process events with value 'Actual'
- language
 - Optional
 - Code for the language used within this message
- recipientRole
 - Optional
 - Suggestions on who should consume the message
- contentObject
 - Required
 - This is the message payload

The contentObject tag contains the following child elements:

- incidentID
 - Optional
 - Replicates the ID found in the EDXL distributionID
- xmlContent/embeddedXMLContent
 - Required
 - This is the 1512 message payload

5.9 Impact Reports

The impactReport is an optional child of idxSubParts. If present it contains specific information on lane closures.

The impactReports/impactReport tag contains the following child elements:

- header
 - Required
 - Replicates the ID found in the EDXL distributionID
- lanes
 - Required
 - Wrapper for the list of lane reports

The lanes element contains zero or more lane elements. Each lane element optionally contains the following child elements:

- lanesAffected
 - Optional
 - The number of lanes closed in a particular direction
- laneCnt
 - Optional
 - The total number of lanes in a particular direction
- location
 - Optional
 - The direction of travel for the lane set
- condition
 - Optional
 - Will always be 'closed'

6. TEXT-TO-SPEECH AUDIO MESSAGES

Outside of the normal incident management message types that have been discussed up to this point, there is another category of messages. This is for the interchange of request and response messages for generating text-to-speech audio files from the text-to-speech engine. The proposed Text-to-Speech server(s) provided by the Vendor must create audio files in both .WAV and .MP3 format and publish those files to the ITMS ESB as described in Section 3.12 of the Traveler Information Scope of Work.

This category of message will be generated by the TMC-APP and IVR endpoint. The table below shows the two scenarios for requesting and response from the two message consumers and producers currently envisioned by the system.

| Source | Destination | Description |
|---------|----------------|--|
| TMC-APP | IVR | The TMC App layer will generate a request audio message containing text to speech message that needs to be converted to WAV/MP3 audio file. The IVR will consume these messages and in return generate response message that TMC App layer will consume. |
| IVR | TMC-APP | The IVR will generate a response message that will contain the converted text to speech in the format of a WAV and MP3 audio file. The audio file will need to be Base64 encoded. |

The messages from the TMC-APP source to IVR will not have any Base64 encoded content payload. While the response message from the IVR to TMC-APP consumer will have the audio file payload in XML markup as Base64 encode string.

Base64 Encoding should follow the RFC4648 standard.

Once encoded properly as Base64, the content can be added to the content tag of the response XML message.


```
<EDXLDistribution xmlns="urn:oasis:names:tc:emergency:EDXL:DE:1.0">
  <distributionID>audioTmc01021</distributionID>
  <senderID>TMC-APP</senderID>
  <dateTimeSent>2011-11-11T12:00:00-05:00</dateTimeSent>
  <distributionStatus>Pending</distributionStatus>
  <distributionType>Request</distributionType>
  <contentObject>
    <contentDescription>
      This is a test of the text to speech call and should be converted into a MP3 file.
    </contentDescription>
  </contentObject>
</EDXLDistribution>
```

Text-To-Speech Response Message

Once the IVR system has received an audio request message from the TMC-APP sender (producer) it will generate associated audio file. Once the audio file (in WAV and MP3 format) the file will be Base64 encoded (as described at the top of this section). This Base64 encoded string then will be added to XML distribution message. Example of this message is as follows:

```
<EDXLDistribution xmlns="urn:oasis:names:tc:emergency:EDXL:DE:1.0">
  <distributionID>audioTmc01021</distributionID>
  <senderID>IVR</senderID>
  <dateTimeSent>2011-11-11T12:00:31-05:00</dateTimeSent>
  <distributionStatus>Success</distributionStatus>
  <distributionType>Response</distributionType>
  <contentObject>
    <contentDescription>
      This is a test of the text to speech call and should be converted into a MP3 file.
    </contentDescription>
    <nonXMLContent>
      <mimeType>audio/mpeg</mimeType>
      <contentData>
        PEhUTUw+PEhFQUQ+DQo8VElUTEU+TmV0d29yayBFcnJvcjwvVElUTEU+DQo8L0hFQUQ+DQo8Qk9E
        WT4NCjxGT05UIGZhy2U9Ikh1bHZldGljYSI+DQo8YmlnPjxzdzdHJvbmc+PC9zdHJvbmc+PC9iaWc+
```

```
PEJSPg0KPC9GT05UPg0KPGJsb2NrcXVvdGU+DQo8VEFCTEUgYm9yZGVyPTAgY2VsbFBhZGRpbmc9
MSB3aWR0aD0iODAlIj4NCjxUUj48VEQ+DQo8Rk9OVCBmYWN1PSJIZWx2ZXRPY2EiPg0KPGJpZz50
ZXR3b3JrIEVycm9yICh0Y3BfZXJyb3IpPC9iaWc+DQo8QlI+DQo8QlI+DQo8L0ZPTlQ+DQo8L1RE
PjwvVFI+DQo8VFI+PFREPg0KPEZPTlQgZmFjZT0iSGVsdmV0aWNhIj4NCkEgY29tbXVuaWNhdGlv
biBlcnJvcjBvY2N1cnJlZDogIknvbm51Y3Rpb24gcmVmdXN1ZCINCjwvRk9OVD4NCjwvVEQ+PC9U
Uj4NCjxUUj48VEQ+DQo8Rk9OVCBmYWN1PSJIZWx2ZXRPY2EiPg0KVGHlIFdlYiBTZXJ2ZXIgbWF5
IGJlIGRvd24sIHRvbyBidXN5LCBvcjBlcHB1cmllbmNpbmcgb3RoZXIgcHJvYmx1bXMgcHJldmVu
dGluZyBpdCBmcm9tIHJlc3BvbmRpbmcgdG8gcmVxdWVzdHMuIFlvdSBtYXkgd2lzaCB0byB0cnkg
YWdhaw4gYXQgYSBsYXRlcjB0aWllLg0KPC9GT05UPg0KPC9URD48L1RSPg0KPFRRSPjxURD4NCjxG
T05UIGZhY2U9Ikh1bHZldG1jYSIu0laRT0yPg0KPEJSPg0KU3RhdGUgQmx1ZUNvYXQgUHJveHkg
Z2VuZXJhdGVkIG1lc3NhZ2UuICBZJiB5b3UgdGhpbmsgdGhpcyBpcyBpbmNvcnJlY3QsIHBSZWZz
ZSBzZW5kIHRoaXMgc2NyZWVuIHRvOiAgU3RhdGVQcm94eUBsaXN0cy5pbmRyYW51dC5zdGF0ZS5k
ZS51cy4gIFlvdXIgcVxdWVzdGVkIGhvc3QgInd3dzEubmV0YXhzLmNvbSIgIFlvdXIgdXN1ciBu
YW1lIFNUQVRFXGRvbi5oYXNzICBZb3VyIFBDIGFkZHZJlc3MgMTcyLjI0LjM5LjcyPGJyPjxicj5Z
b3VyIHJlcXVlc3Qgd2FzIGNhdGVnb3JpemVkIGJ5IEJsdWUgQ29hdCBXZWIgRmlsdGVyIGFzICdC
dXNpbmVzcy9FY29ub215O0NvbXB1dGVycy9JbnRlc5ldCcuIDxicj5JZiB5b3Ugd2lzaCB0byBx
dWVzdGlvbiBvcjBkaXNwdXRlIHRoaXMgcVzdWx0LCBwbGVhc2UgY2xpY2sgPGEgaHJlZj0iaHR0
cDovL3NpdGVyZXZpZxcuYmx1ZWNvYXQuY29tL3NpdGVyZXZpZxcuanNwP3JlZmVycmVpPTEzNiZl
cmw9aHR0cDovL3d3dzEubmV0YXhzLmNvbTo4MDgwL35kZ3Jlc2gvZmVycmlzL2xpZmUud2F2Ij5o
ZXJlPC9hPi4NCjwvRk9OVD4NCjwvVEQ+PC9UUj4NCjwvVEFCTEU+DQo8L2Jsb2NrcXVvdGU+DQo8
L0ZPTlQ+DQo8L0JPRFk+PC9IVE1MPgOK
</contentData>
</nonXMLContent>
</contentObject>
</EDXLDistribution>
```

7. COMMON AUDIO MESSAGE ELEMENTS

The following is a list and explanation of common XML elements within the previous sections audio message examples.

7.1 EDXL Distribution Tags

The EDXLDistribution tag contains the following child elements:

- distributionID

- Required
- This is the unique identifier for the audio request/response
- dateTimeSent
 - Required
 - Timestamp from when this request or response was issued
- distributionStatus
 - Required
 - States whether this request is a real request not processed. IVR consumer should only process events with value 'pending'
- contentObject
 - Required
 - This is the message payload
- senderID
 - Required
 - Name of the subsystem (see table below)

| Subsystem | Description |
|-----------|--|
| IVR | Denotes the IVR system |
| TMC-APP | Denotes sourced from one of the application systems at the TMC |

The contentObject tag contains the following child elements:

- contentDescription
 - Required
 - This is the actual text that should be or was converted to speech audio
- nonXMLContent/mimeType
 - Required
 - Should always be audio/mpeg if MP3 is the agreed upon format.
- nonXMLContent/contentData
 - Required
 - This is the Base64 encode string representation of the actual audio file

Appendix C

511 PLUS PROJECT

Table of Requirements

NOVEMBER 1, 2011

Appendix D

Escrow Agreement