Advanced Automatic Collision Notification (AACN)

Vehicle Emergency Data Set (VEDS)

APCO NENA Candidate ANS 2.102.1.20XX.

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EXECUTIVE SUMMARY

On behalf of public safety communications professionals across the nation, the Standards Development Committee Joint APCO/NENA Advanced Automated Collision Notification (AACN) Standards Development Writing Group has created the Vehicular Emergency Data Set (VEDS) to convey useful and critical data elements to Emergency Communications Centers (ECCs). VEDS is a data set specification (a data object) that is conveyed using a protocol, especially in a Next-Generation 9-1-1 (NG9-1-1) [1] emergency call. The defined data elements assist ECCs in providing an efficient emergency response to vehicular emergency incidents. The VEDS carries data elements related to a vehicle and incident (e.g., a crash or other situation). The VEDS schema and data uses the Extensible Markup Language (XML) and National Information Exchange Model (NIEM) open standards. The diversity of our committee which included representatives from ECCs of different sizes, locations and responsibilities, as well as our technologists familiar with what is on the technology roadmap, allowed the committee to identify many different facets that will be found in this standard.

VEDS version 2.0 reflected the changes to VEDS version 1.0 resulting from the work of the Advanced Collision Notification (ACN) data committee that met in March 2004. VEDS version 3.0 reflected the changes resulting from the work of the AACN Joint APCO/NENA Data Standardization Working Group between January 2010 and February 2012. VEDS version 3.0 incorporated a schema for the defined fields with the namespace http://www.veds.org/acn/1.0**.** VEDS version 3.1 adds several fields and incorporates a schema with namespace http://www.veds.org/acn/3.1**.** Telematics Service Providers (TSPs) and vehicle OEMs were invited to partner with ECCs to initiate a pilot to determine whether further modifications to VEDS were necessary.

VEDS identifies the data elements that TSPs and direct-connect vehicles should send when the data is available. VEDS version 3.1 further identifies the importance to the ECCs of each data element. More than 206 ECCs across the United States responded to a survey in 2018 asking the ECCs to rank each data element as “High”, “Medium”, or “Low”. VEDS 3.1 reflects this collective response.

Vehicle and telematics equipment and systems manufacturers, OEMs, and vendors SHALL transmit as many VEDS data elements as they are capable of and SHOULD support further data elements as additional and more advanced sensors and data points are added to vehicles and telematics systems. Data elements classified in VEDS 3.1 as High should be the first priority to support, with those classified as Medium being the second priority. Regardless of priority, all data elements that can be supported SHALL be.

Properly functioning Next-Generation Advanced Automatic Crash Notification (NG-AACN) systems, including accurate and sufficient crash data, offer significant advantages to all parties. Vehicle occupants and others involved in vehicle incidents have a greater likelihood of reduced mortality and morbidity through prompt and appropriate emergency response, public safety and responder agencies have quicker notification and the information they need, and vehicle manufacturers and system vendors are able to claim enhanced safety offerings. Vehicle systems have a long lead-in time prior to deployment, and vehicles have a long service life, making it imperative for manufacturers and vendors to immediately

[1] NENA-STA-010.3a-2021 NENA i3 Standard for Next Generation 9-1-1, https://www.nena.org/resource/resmgr/standards/nena-sta-010.3a-2021_i3_stan.pdf

include NG-AACN support in their specifications, and continuous NG-AACN and data set improvement in their road maps. The NENA specification for Next-Generation 9-1-1 (NG9-1-1) includes support for NG-AACN, so as ECCs in North America upgrade to support NG9-1-1, they will expect to receive NG-AACN calls.

This document establishes a uniform data set for the transmission of AACN elements among all TSPs, vehicle OEMs, and target recipient agencies including ECCs, emergency responders, and downstream entities including medical facilities capable of providing trauma level patient care.

Chapter One

INTRODUCTION

SCOPE

The scope of this document as a whole applies to ECCs, vehicle manufacturers, OEMs, TSPs, CHE vendors, downstream responders and anyone else involved in the continuum of motor vehicle emergency response.

The scope of this section (the Introduction) introduces the subject material and places it in context.

ACN, AACN, and NG-AACN

An Automatic Crash [or Collision] Notification (ACN) call is an emergency call initiated by a vehicle. Vehicles initiate ACN calls in the event of a crash or other incident when certain thresholds have been exceeded, or upon vehicle occupant request. A vehicle initiates an ACN call either directly to 9-1-1 or to a TSP call center, which verifies the emergency and initiates an emergency call. During an ACN call, some incident- and vehicle-related data (such as vehicle location and description) is conveyed to the Public Safety Telecommunicator (PST)[2], typically via audio communication from a TSP call taker or text-to-speech capability by the vehicle. As part of the emergency call, a voice channel is established between the PST and the vehicle interior (and TSP call taker if a TSP is used). ACN systems and calls have been deployed for over twenty years, saving lives and enhancing safety.

An Advanced ACN (AACN) call is an advanced form of ACN in which a more comprehensive set of data is conveyed. As with ACN, immediately following a crash or other incident when certain thresholds have been exceeded, or upon vehicle occupant request, a vehicle initiates an emergency call (either directly to 9-1-1 or to a TSP call center, which after verifying the emergency initiates an emergency call to 9-1-1). As part of the emergency call, a voice channel is established between the PST and the vehicle interior (and PST if a TSP is used). In a legacy (circuit-switched) AACN call, data is conveyed using the voice channel[3]. In a Next-Generation AACN (NG-AACN) call, the data is conveyed in the call set-up signaling (further data and/or requests for the vehicle to perform an action and the results of such requests may be conveyed during the call, without interrupting the voice channel). AACN data includes vehicle location, incident information, and occupant data. Incident information includes enhanced crash-

[2] Elsewhere referred to as “ECC call taker,” “PSAP call taker,” or just “telecommunicator.”

[3] In North America, the data is typically conveyed in the voice channel orally (spoken by the TSP call taker or text-to-speech systems in the vehicle). In Europe, AACN, known as eCall, is mandated. The data set is standardized as the Minimum Set of Data (MSD). In legacy eCall, the MSD is transmitted using an in-band modem. During data transmission, microphones and audio are muted so vehicle occupants and the TSP call taker are not confronted with the modem screeches, and the in-band modem is not disrupted by voices or background sounds. Next-Generation eCall (NG-eCall) uses the same mechanisms as NG-AACN in North America to transmit data as part of the emergency call setup, and to convey further data, requests from the ECC for the vehicle to perform actions, and responses to those requests.

severity data and crash pulse data collected by embedded, in-vehicle sensors. AACN capabilities significantly increase the benefits of ACN, facilitating timely and appropriate response.

Next-Generation AACN (NG-AACN) takes advantage of the capabilities provided by NG9-1-1 to transcend the limitations of legacy AACN. While legacy 9-1-1 (like legacy telephony in general) is inherently voice-centric, NG9-1-1 (like NG telephony) is inherently data-centric; the call is data at its core. In NG-AACN, data describing the incident, the vehicle, and the occupants is transmitted to the ECC as part of the emergency call setup. The data is standardized as a Vehicle Emergency Data Set (VEDS) object. Standardized data allows ECC call-handling equipment to display ECC-designated fields to the PST at call presentation, with other fields available to the PST (e.g., through screen options). PSTs can immediately see crucial information, such as the nature of the incident, projected need for trauma transport, etc. Being standardized, the data is usable by other agencies (e.g., if the call is transferred) as well as by responders). Standardized data and logging enable post-incident analysis individually as well as in the aggregate (agencies can use the log to improve protocols).

VEDS

The VEDS is a standardized data set that conveys information available within vehicles or known by TSPs to ECCs and responders. VEDS is carried within a Next-Generation AACN (NG-AACN) emergency call, as specified by the NENA architecture for NG9-1-1[4] and IETF RFC 8148[5].

The VEDS data elements are designed to provide major benefits in the dispatch of first responders and to the patient care chain of survival. Based on predictive algorithms, one such data element is an indicator of the likelihood of severe injury. In addition, emergency calls initiated by vehicles have reliability and resiliency advantages over emergency calls initiated by vehicle occupants' cellphones[6].

As a standardized, open, interoperable data set, VEDS is designed to be widely supported by vehicle manufacturers, telematics module vendors, TSPs, ECCs and their vendors for Call Handling Equipment and Computer Aided Dispatch and downstream providers.

All vehicle manufacturers are expected to support VEDS and incorporate these safety elements for life saving from a crash or other emergency event. VEDS provides ECCs in North America[7] with crash data to quickly assess and deploy appropriate emergency response to save lives and property. The standard is

[4] National Emergency Number Association (NENA) 911 Core Services Committee, i3 Architecture Working Group, 2021, "NENA i3 Standard for Next Generation 9-1-1" https://www.nena.org/resource/resmgr/standards/nena-sta-010.3a-2021_i3_stan.pdf

[5] Gellens, R., Rosen, B., & Tschofenig, H., 2017, "Next-Generation Vehicle-Initiated Emergency Calls", RFC 8148, https://datatracker.ietf.org/doc/html/rfc8148

[6] For example, vehicles have inherently greater power, which offers a greater likelihood that an emergency call will be successful in areas of marginal cellular network coverage. Vehicles with on-board cellular modems are typically designed to optimize cellular connectivity (e.g., with greater antenna capability) compared to a vehicle occupant's cellphone, which in addition to device limitations, may be occluded by window treatments, attenuated by vehicle body, etc. Also, a vehicle occupant may be unconscious or incapacitated and unable to reach a phone or initiate an emergency call.

[7] The European eCall system (mandated within the European Union) uses a different data set, known as the Minimum Set of Data (MSD). Aside from the data sets, NG-AACN calls are the same in North America and Europe. See Gellens, R., & Tschofenig, H., 2017, "Next-Generation Pan-European eCall", RFC 8147, https://tools.ietf.org/html/rfc8147, for more information.

also the benchmark for OEMs to incorporate important sensors into their vehicles. The public benefits from having as much of VEDS as possible incorporated into the vehicles they drive as well as autonomous vehicles. Vehicle manufacturers benefit from having enhanced safety measures that save lives and reduce injury when crash avoidance is not possible.

The VEDS data set carries data elements critical to providing appropriate and timely emergency response to vehicular emergency incidents. The data set includes what is often referred to as crash data (although an incident is not necessarily a crash). The data identifies the vehicle and provides information related to the incident. The VEDS data set uses the XML and NIEM open standards to allow easier implementation and provide for wide adoption. The specification will be used by ECCs, medical/EMS and public safety communities, and the telematics/vehicle industries.

As specified in the NENA i3 standard for NG9-1-1 and in IETF RFC 8148, a VEDS data object (along with an NG-AACN metadata/control data object) is conveyed in the call setup signaling of an NG-AACN call (whether initiated by a vehicle or TSP). An incoming NG9-1-1 call is identifiable as an NG-AACN call during call setup and routing. VEDS data elements are thus available to ECC Call Handling Equipment (CHE) before PST assignment. ECC policies are expected to designate VEDS data elements to display to the PST at call presentation, or made available for display upon PST request, or not to be accessed by the ECC at all.

Use Case Scenarios

Two primary use case scenarios are defined: “direct” and “TSP”[8].

DIRECT: In the direct use case scenario, a vehicle initiates an NG-AACN call itself. The call set-up contains a VEDS object (and a metadata/control data object identifying the vehicle’s capabilities and supported actions). The data specific to NG-AACN is in addition to the usual emergency call setup data. The NG9-1-1 call establishes an interactive voice channel. In the Direct model, during the call the ECC may send requests to the vehicle to perform various actions (e.g., sending updated data, flashing lights, etc.) and the vehicle responds directly to the ECC.

TSP: In the TSP use case scenario, a vehicle contacts its TSP and conveys data as determined by the parties involved. The TSP initiates an NG-AACN call. The call set-up contains a VEDS object (and a metadata/control data object identifying the capabilities and supported actions). The data specific to NG-AACN is in addition to the usual emergency call setup data. The NG9-1-1 call establishes an interactive voice channel. In the TSP model, during the call the ECC may transmit to the TSP requests for the vehicle to perform various actions (e.g., sending updated data, flashing lights, etc.), which the TSP relays to the vehicle. The vehicle responds to the TSP, and the TSP relays the responses to the ECC. Communication between the vehicle and TSP is not subject to standardization and is outside the scope of this document.

[8] RFC 8148, “Next-Generation Vehicle-Initiated Emergency Calls,” contains more explanation and background on the direct and TSP modes, which are identified here as use case scenarios. See Gellens, R., Rosen, B., & Tschofenig, H., “Next-Generation Vehicle-Initiated Emergency Calls”, RFC 8148, https://datatracker.ietf.org/doc/html/rfc8148

Chapter Two

AGENCY RESPONSIBILITIES

SCOPE

This section (Agency Responsibilities) discusses the responsibilities of public safety agencies that are expected to receive VEDS objects associated with emergency calls (i.e., PSAP/ECC).

2.1 ECC AACN and VEDS Familiarity

The agency responsibilities at the ECC include:

- Becoming familiar with VEDS elements.
- Identifying if any changes to policy-based routing rules are needed.
- Working with their call handling equipment vendors to verify correct NG-AACN processing and VEDS handling.
- Establishing call-handling policy rules to designate VEDS data elements as to be displayed to PSTs at call presentation, to be available to PSTs upon request, or not accessed by the ECC at all.
- Updating their Standard Operating Procedures (SOPs).

Verifying correct logging and retention of NG-AACN signaling and all accessed VEDS data elements.

2.2 AACN/VEDS testing from TSPs and OEMs to ECCs

As Next Generation 9-1-1 services are deployed, the 9-1-1 Authority's responsibilities include testing for both TSPs and OEMs for their abilities to initiate NG9-1-1 AACN calls that include VEDS, and ECCs for their ability to receive and process NG-AACN calls that include VEDS, along with the ability to perform transfers and log the data. (For legacy 9-1-1, testing has in the past been performed using NENA i2 for TSP standard ALI and relay communication.) For NG9-1-1, testing should be performed with the coordination of the NGCS provider and the ECCs, to verify ECC ability to receive and process complete VEDs.

Chapter Three

Vehicular Emergency Data Set Information Exchange Package Documentation (IEPD)

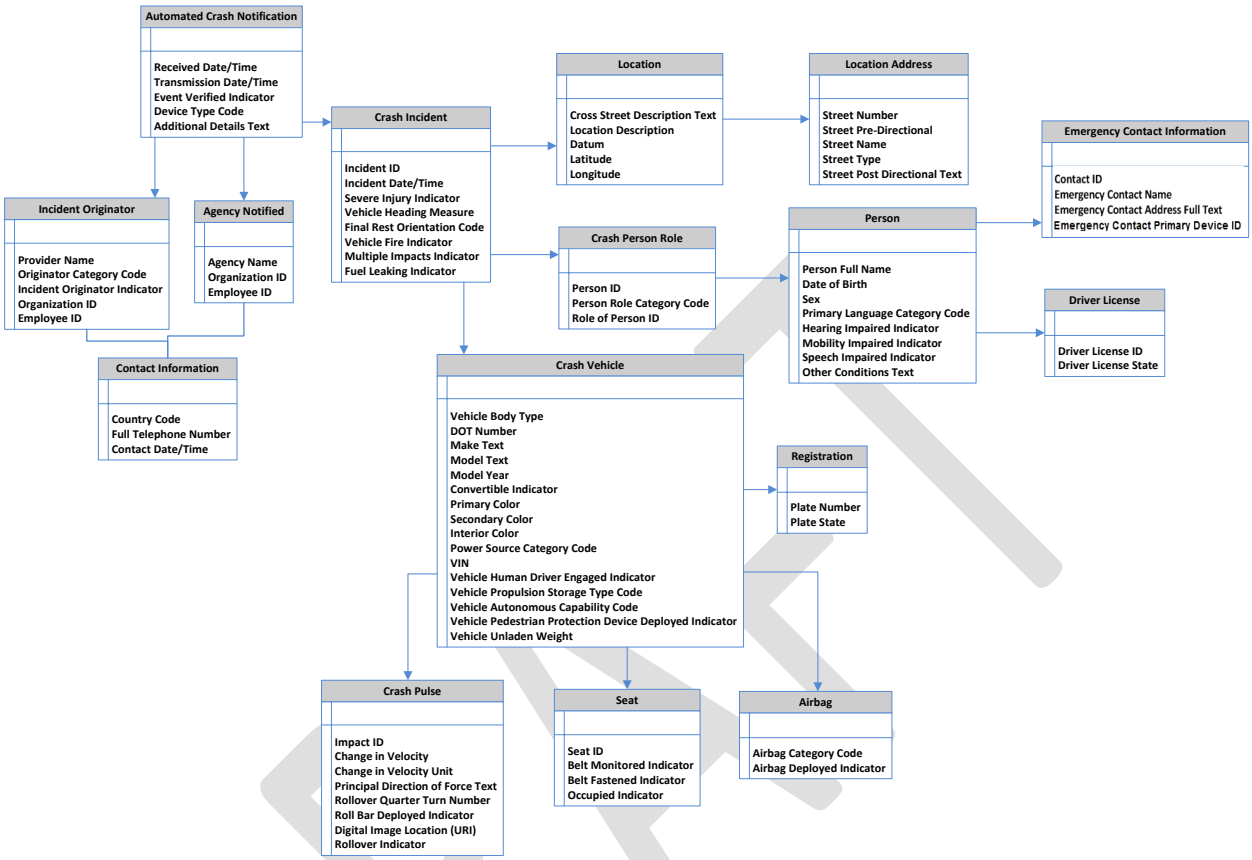
SCOPE

This section contains the definition and description of the VEDS object and its constituent fields.

3.1 Data Object Model

Continued on next page

VEDS Structure – Data Object Model



339 ## 3.2 Data Fields in Order of Importance to the PSAP/ECC

340 # VEDS Structure – Data Fields

PSAP/ECC Importance	Data Elements		
High	• Agency Name • Airbag Category • Airbag Deployed Indicator • Belt Fastened Indicator • Contact Date/Time (Agency Notified) • Cross Street Description (Cross Street 1) • Cross Street Description (Cross Street 2) • Datum • Device Type • Event Verified Indicator • Final Rest Orientation • Fuel Leaking Indicator • Full Telephone Number (Agency Notified) • Full Telephone Number (Incident Originator),	• Hearing Impaired Indicator • Incident Date and Time, • Incident ID Number • Latitude • License Plate • License Plate State • Location Description • Longitude • Make • Model • Multiple Impacts Indicator • Occupied Indicator • Organization ID (Agency Notified) • Person Full Name • Primary Color • Received Date/Time of Incident (By Incident Originator)	• Rollover Indicator • Rollover Quarter Turns • Seat ID • Severe Injury Indicator • Street Name • Street Number • Street Post Directional • Street Pre Directional • Street Type • Transmission Date and Time (To ECC/PSAP) • Vehicle Autonomous Capability • Vehicle Body Type • Vehicle Fire Indicator • Vehicle Human Driver Engaged Indicator • Vehicle Pedestrian Protection Device Deployed Indicator • Vehicle Propulsion Storage Type
Medium	• Additional Details/Open Text • Change in Velocity • Change in Velocity Unit • Contact ID • Convertible Indicator • Digital Image Location • Emergency Contact Name • Emergency Contact Primary Device ID • Impact ID	• Incident Originator Indicator • Mobility Impaired Indicator • Model Year • Organization ID (Incident Originator) • Originator Category • Other Conditions • Person Role Category	• Principal Direction of Force • Provider Name • Roll Bar Deployed Indicator • Sex • Speech Impaired Indicator • Vehicle Heading Measure
Low	• Belt monitored Indicator • Country Code (Agency Notified) • Country Code (Incident Originator) • Date of Birth • DOT Number	• Emergency Contact Address Full • Employee ID (ECC/PSAP) • Employee ID (Incident Originator) • Interior Color • Person ID	• Power Source Category • Primary Language Category • Secondary Color • Vehicle Unladen Weight • VIN

3.3 Data Definition[9]

VEDS Structure – Data Definition

3.3.1 Automated Crash Notification Data

Automated Crash Data			
NAME	**LABEL**	**DESCRIPTION**	**ECC Importance**
Received Date/Time (By Incident Originator)	*<veds:AutomatedCrashNotification/nc:DocumentReceivedDate/**nc:DateTime**>	UTC date and time that the incident originator received notification of the incident. Value: CCYY-MM-DDThh:mm:ss.sss (concatenation of date and time , separated by a literal letter "T") as specified in xsd:dateTime	High
Transmission Date and Time (To ECC)	<veds:AutomatedCrashNotification/nc:DocumentPostDate/**nc:DateTime**>	UTC date and time that the incident data was transmitted to the PSAP when such a transport mechanism exists such as NLETS or NG9-1-1. Value: CCYY-MM-DDThh:mm:ss.sss (concatenation of date and time , separated by a literal letter "T") as specified in xsd:dateTime	High
Event Verified Indicator	<veds:AutomatedCrashNotification/**veds:EventVerifiedIndicator**>	Indicates if there was confirmation (either verbal or electronic) of the event by the incident originator and a PSAP or other public safety agency. Values: • true (incident verified) • false (incident not verified)	High
Device Type	*<veds:AutomatedCrashNotification/veds:**NotificationDeviceTypeCode**>	Type of device that caused event notification to occur. Values: • NORMAL • AIRBAG (AACN Airbag) • TENSIONER (AACN Seatbelt Tensioner) • ACCELEROMETERS (AACN Vehicle Accelerometers) • MANUAL (Manual Push Button) • INJURY (AACN Injury Severity) • OTHER (AACN Other)	High
Additional Details / Open Comment	<veds:AutomatedCrashNotification/**nc:DocumentDescriptionText**>	Field for Comment. Format: Free Text	Medium

[9] A data element left blank or missing is an implied "Unknown".

3.3.2 Incident Originator Data

Information about the entity providing data about the incident.			
NAME	**LABEL**	**DESCRIPTION**	**ECC Importance**
Provider Name	*<veds:AutomatedCrashNotification/veds:NotificationOriginatingOrganization/**nc:OrganizationName**>	Name of provider or system providing data. Format: Text	Medium
Originator Category	*<veds:AutomatedCrashNotification/veds:NotificationOriginatingOrganization/**veds:VEDSNotificationOriginatorCode**>	Categorizes the provider or source of the data. As with most VEDS elements, this element may appear multiple times, e.g., a data source may be In-Vehicle Telemetry and a second data source may be the Vehicle Telematics Service Provider, while a third data source might be the Public Safety Agency. Values: • VEHICLE (In-Vehicle Telemetry) • DIRECT (Direct Dial) • TELEMATICS (Vehicle Telematics Service Provider) • ROADSIDE (Roadside Assistance Provider) • COMMERCIAL (Commercial Vehicle Operator) • PSAP (Public Safety Answering Point, also known as Emergency Communications Center) • PSA (Public Safety Agency)	Medium
Incident Originator Indicator	*<veds:AutomatedCrashNotification/veds:NotificationOriginatingOrganization/**veds:IncidentOriginatorIndicator**>	Indicates if the source providing the data is the originator of the incident. Values: • true • false	Medium
Organization ID (Incident Originator)	*<veds:AutomatedCrashNotification/veds:NotificationOriginatingOrganization/nc:OrganizationIdentification/**nc:IdentificationID**>	A unique identifier for possible interface exchanges between a Telematics Service Provider and a 9-1-1 ECC using NG9-1-1, NLETS, or another transport method. Superseded in most cases by the metadata/control object of RFC8147, as referenced in RFC8148. A suggested value is the Content-ID of the metadata/control object sent with the NG9-1-1-call. Format: Text	Medium
Employee ID (Incident Originator)	*<veds:AutomatedCrashNotification/veds:NotificationOriginatingOrganization/nc:EmployeeIdentification/**nc:IdentificationID**>	ID of the employee that initiated the data transmission to the ECC. Typically, an employee's initials or other ID. Format: Text	Low
Full Telephone Number (Incident Originator)	*<veds:AutomatedCrashNotification/veds:ContactActivity/nc:ContactTelephoneNumber/nc:InternationalTelephoneNumber/**nc:TelephoneNumberID**>	7 X 24 telephone number to contact the originating agency. Format: NPA-NXX-LINE	High

NAME	LABEL	DESCRIPTION	ECC Importance
Country Code (Incident Originator)	<veds:AutomatedCrashNotification/veds:ContactActivity/nc:ContactTelephoneNumber/nc:InternationalTelephoneNumber/**nc:TelephoneCountryCodeID**>	ITU-T Country Code if international Format: Numeric	Low

3.3.3 Agency Notified

Agency notified by the incident originator			
NOTE: As a matter of record, an ECC logs and retains unaltered the VEDS data transmitted with and/or received during an NG9-1-1 call. If an ECC or downstream agency updates any VEDS fields, it should do so in a copy. Normally, ECCs and downstream agencies update data within an Emergency Incident Data Object (EIDO) rather than within original data objects received with a call.			
Begin Child Elements of Agency Notified			
NAME	**LABEL**	**DESCRIPTION**	**ECC Importance**
Agency Name	*<veds:AutomatedCrashNotification/veds:NotificationDestinationOrganization/**nc:OrganizationName**>	Name of agency notified by incident originator. Format: Text	High
Organization ID (Agency Notified)	<veds:AutomatedCrashNotification/veds:NotificationDestinationOrganization/nc:OrganizationIdentification/**nc:IdentificationID**>	Unique identifier for the agency receiving the data. Typically, this could be a NLETS ORI, a NG9-1-1 agency identifier, or other identifier. May be a required field for certain data transmission layers. Format: Text	High
Employee ID (Agency Notified)	*<veds:AutomatedCrashNotification/veds:NotificationDestinationOrganization/nc:EmployeeIdentification/**nc:IdentificationID**>	Identification number or name of individual at agency who received call. Format: Text	Low
Full Telephone Number (Agency Notified)	<veds:AutomatedCrashNotification/veds:ContactActivity/nc:ContactTelephoneNumber/nc:InternationalTelephoneNumber/**nc:TelephoneNumberID**>	7 X 24 telephone number called to contact agency. Format: NPA-NXX-LINE	High
Country Code (Agency Notified)	<veds:AutomatedCrashNotification/veds:ContactActivity/nc:ContactTelephoneNumber/nc:InternationalTelephoneNumber/**nc:TelephoneCountryCodeID**>	ITU-T Country Code if international Format: Numeric	Low
Contact Date/Time (Agency Notified)	<veds:AutomatedCrashNotification/veds:ContactActivity/nc:ActivityDate/**nc:DateTime**>	UTC date and time the notified agency was first contacted by incident originator. Value: CCYY-MM-DDThh:mm:ss.sss (concatenation of date and time , separated by a literal letter "T") as specified in xsd:dateTime	High
End Child Elements of Agency Notified			

3.3.4 Crash Incident Data

Begin Child Elements of Crash Incident Data			
NAME	**LABEL**	**DESCRIPTION**	**ECC Importance**
Incident ID Number	*<veds:AutomatedCrashNotification/veds:Crash/nc:ActivityIdentification/**nc:IdentificationID**>	Indicates the internal case identifier number of the incident used by the incident originator. Format: Text	High
Severe Injury Indicator	*<veds:AutomatedCrashNotification/veds:Crash/**veds:SevereInjuryIndicator**>	High Likelihood of Severe Injury? Values: • true • false The value 'true' indicates a greater than 20% probability of an Injury Severity Score ISS15 as predicted by an injury severity algorithm per the recommendations from the 2008 CDC AACN Expert Panel	High
Vehicle Heading Measure	*<veds:AutomatedCrashNotification/veds:Crash/m:ConveyanceHeadingMeasure/**nc:MeasurePointValue**>	Direction vehicle was heading directly before crash, as a measure of the angular heading of the vehicle. Values: A compass heading in the range 0 to 359. NIEM 2.1 defines this as a point value, a range, or text. RFC 8148 has an example of '278', as a compass heading. Specifying this seems more consistent and reliable.	Medium
Final Rest Orientation	*<veds:AutomatedCrashNotification/veds:Crash/**veds:VehicleFinalRestOrientationCategoryCode**>	Orientation of vehicle at final rest. Values: • Normal • Driver • Passenger • Roof • Rear (Rear Bumper) • Front (Front Bumper) • Unknown Format: Text	High
Vehicle Fire Indicator	*<veds:AutomatedCrashNotification/veds:Crash/**veds:VehicleFireIndicator**>	Indicates if any part of the vehicle is on fire. Values: • true • false	High

NAME	LABEL	DESCRIPTION	ECC Importance
Multiple Impacts Indicator	*<veds:AutomatedCrashNotification/veds:Crash/veds:MultipleImpactsIndicator>	Indicates if the vehicle was subjected to multiple impacts. Values: • true • False	High
Fuel Leaking Indicator	<veds:AutomatedCrashNotification/veds:Crash/veds:FuelLeakingIndicator>	Indicates if a fuel leak has been detected. Values: • true • false	High
End Child Elements of Crash Data			

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3.3.5 Crash Incident Location

Describes the location of the incident using a set of child elements – Latitude, Longitude, Closest Civic Address and/or Intersection [10]			
Begin Child Elements of Crash Incident Location			
NAME	**LABEL**	**DESCRIPTION**	**ECC Importance**
Cross Street Description (Cross Street 1)	*<veds:AutomatedCrashNotification/nc:Location/nc:LocationCrossStreet/**nc:CrossStreetDescriptionText**>	This is the closest cross street to the incident. May be the first street of an intersection. Format: Text	High
Cross Street Description (Cross Street 2)	*<veds:AutomatedCrashNotification/nc:Location/nc:LocationCrossStreet/**nc:CrossStreetDescriptionText**>	If two cross streets are indicated, this indicates the second. May be the second street of an intersection. Format: Text	High
Datum	*<veds:AutomatedCrashNotification/nc:Location/nc:LocationTwoDimensionalGeographicCoordinate/**nc:GeographicDatumCode**>	Map projection and coordinate system recommended for the display of the Longitude and Latitude coordinates. Example values permitted by the nc:GeographicDatumCode code list. • NAR-C (Contiguous United States) • NAR-A (Alaska) • NAR-B (Canada) • NAR-H (Hawaii) • NAS-A (Eastern United States) • NAS-B (Western United States)(Additional values are as specified in the nc:GeographicDatumCode code list)) NOTE: **nc:GeographicDatumCode** does not permit WGS84 nor NAD83. However, VEDS is carried in an NG9-1-1 call, which conveys a PIDF-LO that can use WGS84 and other values.	

[10] As currently defined, VEDS conveys location in two dimensions (e.g., as latitude and longitude but not "Z-axis" information such as elevation, altitude, or height above ellipsoid). However, VEDS is not sent in isolation. It is sent in an NG9-1-1 call, which transmits location information in a PIDF-LO structure conveyed in the call signaling. The PIDF-LO format allows three-dimensional points in geospatial formats and Z-axis information such as floor in civic formats. In NG9-1-1, the location information conveyed at the SIP (call setup) level is the primary location used for routing and the default location used for dispatch in the absence of better location (such as location conveyed verbally by the caller during the call). The location information within VEDS is supplemental but can be more accurate than location information conveyed in the call setup, depending on how each location estimate is determined. As an example, in various situations location estimated by a vehicle can be more accurate than location estimated by a cellphone due to the vehicle's inherent advantages, such as greater power, more sensitive Global Navigation Satellite System (GNSS, e.g., GPS) reception capability, ability to use speed and heading information to compensate for GNSS fade or loss, etc. Location determination technologies deployed in vehicles (e.g., GNSS) typically support Z-axis information (depending on circumstances). For these reasons, it is recommended that enhancing VEDS to convey Z-axis information be a consideration for a future update.

NAME	LABEL	DESCRIPTION	ECC Importance
Latitude	*<veds:AutomatedCrashNotification/nc:Location/nc:LocationTwoDimensionalGeographicCoordinate/nc:GeographicCoordinateLatitude/**nc:LatitudeDegreeValue**>	Latitudinal coordinate of the incident site in decimal degrees (-90° to +90°). Child element of Location. Format: (+/-) 00.###### Omit value if latitude is unknown	High
Longitude	*<veds:AutomatedCrashNotification/nc:Location/nc:LocationTwoDimensionalGeographicCoordinate/nc:GeographicCoordinateLongitude/**nc:LongitudeDegreeValue**>	Longitudinal coordinate of the incident site in decimal degrees (-180 to +180°). Child element of Location. Format: (+/-) 000.###### Omit value if longitude is unknown	High
Street Number	*<veds:AutomatedCrashNotification/nc:Location/nc:LocationAddress/nc:StructuredAddress/nc:LocationStreet/**nc:StreetNumberText**>	A number that identifies a particular unit or location within a street. Format: Numeric	High
Street Pre Directional	*<veds:AutomatedCrashNotification/nc:Location/nc:LocationAddress/nc:StructuredAddress/nc:LocationStreet/**nc:StreetPredirectionalText**>	A direction that appears before a street name. Format: Alpha	High
Street Name	*<veds:AutomatedCrashNotification/nc:Location/nc:LocationAddress/nc:StructuredAddress/nc:LocationStreet/**nc:StreetName**>	A name of a street. Format: Text	High
Street Type	*<veds:AutomatedCrashNotification/nc:Location/nc:LocationAddress/nc:StructuredAddress/nc:LocationStreet/**nc:StreetCategoryText**>	A kind of street. Format: Text	High
Street Post Directional	*<veds:AutomatedCrashNotification/nc:Location/nc:LocationAddress/nc:StructuredAddress/nc:LocationStreet/**nc:StreetPostdirectionalText**>	A direction that appears after a street name. Format: Text	High
End Child Elements of Crash Incident Location			

3.3.6 Crash Vehicle

Data automatically generated by the incident originator.			
Begin Child Elements of Vehicle Data			
NAME	**LABEL**	**DESCRIPTION**	**ECC Importance**
Vehicle Body Type	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/**j:VehicleBodyCategoryCode**>	Vehicle Body Type. Values: A code in the range 101 through 116, per NIEM 2.0: 101 Passenger Car 102 (Sport)Utility Vehicle 103 Passenger Van 104 Cargo Van (10,000 lbs (4,536 kg) or less) 105 Pick Up 106 Motor Home 107 School Bus 108 Transit Bus 109 Motor Coach 110 Other Bus 111 Motor Cycle 112 Moped 113 Low Speed Vehicle 114 Other Light Trucks (10,000 lbs (4,536 kg) or less) 115 Medium/Heavy Trucks (more than 10,000 lbs (4,536 kg)) 116 Other Notes: • **Motorcycles** *(Includes motorcycles, motor scooters, mopeds, motor-powered bicycles, three-wheel motorcycles, and All-Terrain Vehicles.) Typical vehicles have saddle type seats and are steered by handlebars rather than steering wheels* • **Passenger Vehicles** *(Includes Passenger Cars, Electric Vehicles, Alternate Propulsion Vehicles, Utility Vehicles, Van-Based Light Trucks, Light Conventional Trucks, and Other Light Conventional Trucks <10,000 lbs.) Typical vehicles are those manufactured primarily for the purpose of carrying passengers and single-unit vehicles pulling recreational or other light trailers)* • **Buses** *(All Buses except van-based)* • **Motor Homes** *(All classes including light/medium/heavy truck-based motor homes, and campers or unknown type motor homes)* • **Heavy/Medium Vehicles 10,000-30,000 lbs** *(Typically trucks with dual rear wheels or more than two axles)* • **Semi-Truck** *(Big rig, transport vehicle, may be up to 120,000 lbs)* • **Other Vehicles** *(Snowmobiles, farm vehicles, construction equipment other than trucks, street sweepers, dune buggy, go-cart- golf cart, etc.)*	High

NAME	LABEL	DESCRIPTION	ECC Importance
DOT Number	<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/**j:CommercialCarrierUSDOTNumber**>	USDOT assigned vehicle number (if commercial); USDOT value could be used for other purposes, i.e., LoJack, OnStar, etc. Format: seven digits (NNNNNNN)	Low
Make	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/**nc:ItemMakeName**>	Indicates vehicle make, e.g., Cadillac, Ford Format: Text	High
Model	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/**nc:ItemModelName**>	Indicates vehicle model, e.g., Escalade, Taurus Format: Text	High
Model Year	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/**nc:ItemModelYearDate**>	Indicates vehicle model year, e.g., 2002 Format: normally a simple four-digit year, but any xsd:gYear value is permitted	Medium
Convertible Indicator	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/**veds:ConvertibleIndicator**>	Indicates whether a vehicle is a convertible. Values: • true • false	Medium
Primary Color	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/**nc:ConveyanceColorPrimaryText**>	Indicates Primary Color of Vehicle. Format: Text	High
Secondary Color	<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/**nc:ConveyanceColorSecondaryText**>	Indicates Vehicle Secondary Color. Format: Text	Low
Interior Color	<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/**nc:VehicleColorInteriorText**>	Indicates Vehicle Interior Color. Format: Text	Low
Power Source Category	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/**veds:PowerSourceCategoryCode**>	Indicates the nature of the power source. Values: • MAIN (main battery) • BACKUP (backup battery). • OTHER	Low
VIN	<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/nc:VehicleIdentification/**nc:IdentificationID**>	Vehicle Identification Number, length of 17 characters. Format: Text	Low
License Plate Number	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/nc:ConveyanceRegistrationPlateIdentification/**nc:IdentificationID**>	Indicates license plate number of vehicle. Format: Text	High

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NAME	LABEL	DESCRIPTION	ECC Importance
License Plate State Name	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/nc:ConveyanceRegistrationPlateIdentification/**nc:IdentificationJurisdictionText**>	Indicates the license plate state. Values: • State abbreviation (United States and Mexico) • Canadian province, • Otherwise, full value if other location Format: Text	High
Vehicle Human Driver Engaged Indicator	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:VehicleHumanDriverEngagedIndicator>	True indicates that the vehicle has detected that the human driver was engaged (e.g., hands on the wheel, eyes on the road) at the time that the data was collected during the crash. Values: • true • false	High
Vehicle Propulsion Storage Type	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:VehiclePrpulsionStorageCode>	A code list that describes the method that is used to store energy for a vehicle. Values: • Gasoline = Gasoline Storage Present • CNG = Compressed Natural Gas Storage Present • Diesel = Diesel Storage Present • Electric = Electric Energy Storage Present • Ethanol = Ethanol Storage Present • Hydrogen = Hydrogen Storage Present • LPG = Liquid Propane Gas Storage Present • Other = Other	High
Vehicle Autonomous Capability	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:VehicleAutonomousCapabilityCode>	Based on the SAE International's Standard J3016, this code list classifies a system's level of sophistication. Values: • 0 = Not Autonomous • 1 = Driver Assistance • 2 = Partial Automation • 3 = Conditional Automation • 4 = High Automation • 5 = Complete Automation Format: Numeric	High
Vehicle Pedestrian Protection Device Deployed Indicator	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:VehiclePedestrianProtectionDeviceDeployedIndicator>	True indicates that the vehicle pedestrian protection device deployed during the crash. Values: • true • false	High
Vehicle Unladen Weight	<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/nc:VehicleUnladenWeightMeasure/**nc:MeasurePointValue**>	Indicates curbside weight of vehicle measured in pounds. Format: a positive integer	Low
End Child Elements of Crash Vehicle Data			

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Crash Data About the Impact(s).			
Begin Child Element of Crash Pulse			
NAME	**LABEL**	**DESCRIPTION**	**ECC Importance**
Impact ID	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:VehicleCrashPulse/nc:ActivityIdentification/**nc:IdentificationID**>	Numerical and sequential impact identifier. Values: • First • Second • Third • Forth • Fifth • Sixth • Seventh • Eight • Ninth • Tenth • (etc.) Format: Text	Medium

Change in Velocity
and
Change in Velocity Unit
	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:VehicleCrashPulse/veds:CrashPulseChangeInVelocityMeasure/**nc:MeasurePointValue**>	Force of impact based on the change in velocity over the duration of the crash pulse (measured in units of 0-999 KPH or MPH.
		Format: The KPH or MPH numeric value and the string "MPH" or "KPH", e.g.,
		`<CrashPulseChangeInVelocityMeasure>`
		`<nc:SpeedMeasure>`
		`<nc:MeasurePointValue>100`
		`</nc:MeasurePointValue>`
		`<nc:MeasureUnitText>MPH`
		`</nc:MeasureUnitText>`
		`</nc:SpeedMeasure>`
		`</CrashPulseChangeInVelocityMeasure>`
			Medium

Principal Direction of Force	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:VehicleCrashPulse/**veds:CrashPulsePrincipalDirectionOfForceValue**>	Principal direction of the force of the impact to nearest O'clock Reading (valid numbers are integers 1 through 12, where 12 O'clock corresponds to a frontal collision, 3 O'clock corresponds to a passenger side (right side) collision etc.	Medium

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NAME	LABEL	DESCRIPTION	ECC Importance
Rollover Quarter Turns	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:VehicleCrashPulse/**veds:CrashPulseRolloverQuarterTurnsValue**>	Number of quarter turns in concert with a rollover. Expressed as a non-negative integer. Format: Non-negative integer	High
Roll Bar Deployed Indicator	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/**veds:VehicleRollbarDeployedIndicator**>	Is Roll Bar Deployed? Values: • true • false	Medium
Digital Image Location	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/**nc:Image/nc:BinaryLocationURI**>	URL where digital image is available.[11] Format: URL	Medium
Rollover Indicator	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:VehicleCrashPulse/**veds:VehicleRolloverIndicator**>	Indicates if the vehicle rolled over. Values: • true • false	High
End Child Element of Crash Pulse			

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[11] Note that as specified in RFC 8148, NG-AACN allows the vehicle or TSP to indicate to the ECC that one or more on-board cameras are available, and for the ECC to request one or more camera feeds. See Gellens, R., Rosen, B., & Tschofenig, H., 2017, "Next-Generation Vehicle-Initiated Emergency Calls", RFC 8148, https://datatracker.ietf.org/doc/html/rfc8148

3.3.6.2 Seat Data

Begin Child Elements of Seat			
NAME	**LABEL**	**DESCRIPTION**	**ECC Importance**
Seat ID	<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:VehicleSeat/**veds:VehicleSeatLocationCategoryCode**>	Indicates seatbelt and seat sensor data for individual seat positions in the vehicle. Required attribute Position. Values 1-9: 1=Driver front 2=Passenger front 3=second row left 4=second row middle 5=second row right 6=third row left 7=third row middle 8=third row right 9=front row middle	High
Belt Monitored Indicator	<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:VehicleSeat/**veds:VehicleSeatbeltMonitoredIndicator**>	Indicates if this seatbelt is being monitored. Values: • true • false	Low
Belt Fastened Indicator	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:VehicleSeat/**veds:VehicleSeatbeltFastenedIndicator**>	Indicates if this seatbelt is fastened. Values: • true • false	High
Occupied Indicator	<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:VehicleSeat/**veds:VehicleSeatOccupiedIndicator**>	Indicates if this seat sensor determines seat is occupied. Values: • true • false	High
End Child Elements of Seat			

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366 3.3.6.3 Airbag

Begin Child Elements of Airbag			
NAME	**LABEL**	**DESCRIPTION**	**ECC Importance**
Airbag Deployed Indicator	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:Airbag/**veds:AirbagDeployedIndicator**>	Indicates if this airbag is deployed. Values: • true • false	High
Airbag category	<veds:AutomatedCrashNotification/veds:Crash/veds:CrashVehicle/veds:Airbag/**veds:AirbagCategoryCode**>	Categorizes this airbag. Values: • FRONT (front) • SIDE (side) • CURTAIN (curtain) • ROOF (roof) • SEAT (seat belt airbag) Format: Text	High
End Child Element of Airbag			

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3.3.7 Individuals Associated with the Vehicle

Common details about any person involved in a traffic accident or other incident.			
Begin Child Elements of Crash Person			
NAME	**LABEL**	**DESCRIPTION**	**ECC Importance**
Person ID	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashPerson/veds:CrashPersonIdentification/**nc:IdentificationID**>	A sequential identification assigned to each person involved in a crash or other incident. First person has the value 0, second person has the value 1, etc. Format: Numeric	Low
Person Role Category	*<veds:AutomatedCrashNotification/veds:Crash/veds:CrashPerson/**nc:RoleOfPersonReference**>	Describes the role of any person involved in the crash or other incident. This field may occur multiple times Values: • CONFIRMED (Confirmed Driver) • PRIMARY (Primary Driver) • FREQUENT (Frequent Driver) • PASSENGER (Passenger) • SUBSCRIBER (Telematics Service Subscriber) • OWNER (Vehicle Owner) Format: Text	Medium
Person Full Name	*<veds:AutomatedCrashNotification/veds:Person/nc:PersonName/**nc:PersonFullName**>	Name of the associated person. Format: Text	High
Date of Birth	*<veds:AutomatedCrashNotification/veds:Person/**nc:PersonBirthDate/nc:Date**>	Date of Birth for the Associated Individual expressed as ~~at~~ four-digit year, hyphen, two-digit month, hyphen, two-digit day. Format: yyyy-mm-dd.	Low
Sex	*<veds:AutomatedCrashNotification/veds:Person/**nc:PersonSexCode**>	Indicates the gender identity of the person. Values: M = Male F = Female[12]	Medium

[12] A future revision of VEDS should add a nonbinary option.

NAME	LABEL	DESCRIPTION	ECC Importance
Primary Language[13] Category	<veds:AutomatedCrashNotification/veds:Person/nc:PersonPrimaryLanguage/**nc:LanguageName**>	Primary Language. Values: • English • Spanish • French • German • Russian • Japanese • Chinese • Arabic • Italian • Korean • Portuguese • Vietnamese • (Other - Specified as Open Text) Format: Text	Low
Hearing[14] Impaired Indicator	<veds:AutomatedCrashNotification/veds:Person/**veds:PersonHearingImpairedIndicator**>	Indicates whether the person is hearing impaired. Values: • true • false	High
Mobility Impaired Indicator	<veds:AutomatedCrashNotification/veds:Person/**veds:PersonMobilityImpairedIndicator**>	Indicates whether the person is mobility impaired Values: • true • false	Medium

[13] Since VEDS is transmitted inside an NG9-1-1 call, RFC 8373, "Negotiating Human Language in Real-Time Communications" provides a mechanism to negotiate human language and modality (spoken, text, signed) during call set-up. This mechanism is supported by the NENA Next-Generation 9-1-1 (i3v3) architecture and policy-based routing. See Gellens, R., 2018, “Negotiating Human Language in Real-Time Communications”, RFC 8373, https://datatracker.ietf.org/doc/html/rfc8373

[14] Since VEDS is transmitted inside an NG9-1-1 call, RFC 8373, "Negotiating Human Language in Real-Time Communications" provides a mechanism to negotiate human language and modality (spoken, text, signed) during call set-up. This mechanism is supported by the NENA Next-Generation 9-1-1 (i3v3) architecture and policy-based routing. See Gellens, R., 2018, “Negotiating Human Language in Real-Time Communications”, RFC 8373, https://datatracker.ietf.org/doc/html/rfc8373

NAME	LABEL	DESCRIPTION	ECC Importance
Speech Impaired[15] Indicator	<veds:AutomatedCrashNotification/veds:Person/**veds:PersonSpeechImpairedIndicator**>	Indicates whether the person is speech impaired. Values: • true • false	Medium
Other Conditions	<veds:AutomatedCrashNotification/veds:Person/**veds:PersonOtherConditionsText**>	Other condition information that may be of use to responders. Format: Text	Medium
Driver's License ID	<veds:AutomatedCrashNotification/veds:Person/nc:DriverLicense/nc:DriverLicenseIdentification/**nc:IdentificationID**>	Driver License Number. (If applicable) Format: Text	Medium
Driver's License State	<veds:AutomatedCrashNotification/veds:Person/nc:DriverLicense/nc:DriverLicenseIdentification/**nc:IdentificationJurisdictionText**>	Driver's License State or Province (If applicable) Format: Text	Medium
End Child Elements of Crash Person			

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372 3.3.7.1 Each Emergency Contact

Begin Child Elements of Each Emergency Contact			
NAME	**LABEL**	**DESCRIPTION**	**ECC Importance**
Contact ID	<veds:AutomatedCrashNotification/veds:ContactInformation/**veds:ContactIdentification**>	ID for each emergency contact: 0 to infinity Format: Numeric	Medium
Emergency Contact Name	<veds:AutomatedCrashNotification/veds:ContactInformation/**nc:ContactEntityDescriptionText**>	Name of Emergency Contact Format: Text	Medium

[15] Since VEDS is transmitted inside an NG9-1-1 call, RFC 8373, "Negotiating Human Language in Real-Time Communications", provides a mechanism to negotiate human language and modality (spoken, text, signed) during call set-up. This mechanism is supported by the NENA i3 standard for NG9-1-1 and policy-based routing. See Gellens, R., 2018, "Negotiating Human Language in Real-Time Communications", RFC 8373, https://datatracker.ietf.org/doc/html/rfc8373

Emergency Contact Address Full	<veds:AutomatedCrashNotification/veds:ContactInformation/nc:ContactMailingAddress/**nc:AddressFullText**>	Full Address of Emergency Contact Format: Text	Low
Emergency Contact Primary Device ID	<veds:AutomatedCrashNotification/veds:ContactInformation/nc:ContactTelephoneNumber/**nc:FullTelephoneNumber**>	Emergency contact primary contact device number identification i.e., Telephone or pager Format: NPA-NXX-LINE	Medium
End Child Elements of Each Emergency Contact			

3.4 Post-Crash On-Scene Data

Information gathered by inquiries of the incident originator or agencies on the scene responding to the incident.
Note: Remaining Post-Crash On-Scene Data was decided by the AACN Joint APCO/NENA Data Standardization Workgroup to be Out-of-Scope in providing a data set that TSPs could use to send crash notifications to 9-1-1 PSAPs for initial dispatch purposes and moving forward with pilots. The Section 3.4 dataset will be reintroduced at a later date once considered within scope and after the initial pilots with the TSPs/PSAPs have been achieved.

3.5 Personal Medical Data (Placeholder)

Medical information previously known and stored by the incident originator or a third party provider.
Individuals Associated with the Vehicle Having a Role and/or Occupants **Information for each individual listed under personal medical data subscription with required attribute: id.**
Note: Personal Medical Data was decided by the AACN Joint APCO/NENA Data Standardization Workgroup to be Out-of-Scope in providing a data set that TSPs could use to send crash notifications to 9-1-1 PSAPs for initial dispatch purposes and moving forward with pilots. The Section 3.5 dataset will be reintroduced at a later date once considered within scope and after the initial pilots with the TSPs/ECCs have been achieved.

Chapter Four

VEDS Examples

SCOPE

This section provides examples for illustration of valid filled-in VEDS objects.

4.1 Example 1 (RFC 8148)

The following example is the one from RFC 8148 adjusted to better fit with the schema in this document and add prefixes to certain data elements.

```
<?xml version="1.0" encoding="UTF-8"?>
<veds:AutomatedCrashNotification xmlns:s="http://niem.gov/niem/structures/2.0"
xsi:schemaLocation="http://www.veds.org/acn/1.1 ../Schema/veds/1.1/veds.xsd"
xmlns:j="http://niem.gov/niem/domains/jxdm/4.1"
xmlns:m="http://niem.gov/niem/domains/maritime/2.1" xmlns:nc="http://niem.gov/niem/niem-
core/2.0" xmlns:veds="http://www.veds.org/acn/1.1"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

    <veds:Crash>
      <veds:CrashVehicle>
        <nc:ItemMakeName >
          Saab
        </nc:ItemMakeName>
        <nc:ItemModelName >
          9-5
        </nc:ItemModelName>
        <nc:ItemModelYearDate  >
          2015
        </nc:ItemModelYearDate>
        <veds:Airbag>
          <veds:AirbagCategoryCode>
            FRONT
          </veds:AirbagCategoryCode>
          <veds:AirbagDeployedIndicator>
            true
          </veds:AirbagDeployedIndicator>
        </veds:Airbag>
        <veds:ConvertibleIndicator>
          false
        </veds:ConvertibleIndicator>
```

```
<veds:PowerSourceCategoryCode>
    MAIN
</veds:PowerSourceCategoryCode>
<j:VehicleBodyCategoryCode>
   101
</j:VehicleBodyCategoryCode>
<veds:VehicleCrashPulse>
   <veds:CrashPulseChangeInVelocityMeasure>
      <nc:MeasurePointValue>
         100
      </nc:MeasurePointValue>
      <nc:MeasureUnitText>
         MPH</nc:MeasureUnitText>
    </veds:CrashPulseChangeInVelocityMeasure>
         <veds:CrashPulsePrincipalDirectionOfForceValue>12
         </veds:CrashPulsePrincipalDirectionOfForceValue>
   <veds:CrashPulseRolloverQuarterTurnsValue>1
   </veds:CrashPulseRolloverQuarterTurnsValue>
</veds:VehicleCrashPulse>
<veds:VehicleRollbarDeployedIndicator>false
</veds:VehicleRollbarDeployedIndicator>
<veds:VehicleSeat>
   <veds:VehicleSeatLocationCategoryCode>1
   </veds:VehicleSeatLocationCategoryCode>
   <veds:VehicleSeatOccupiedIndicator>true
   </veds:VehicleSeatOccupiedIndicator>
   <veds:VehicleSeatbeltFastenedIndicator>true
   </veds:VehicleSeatbeltFastenedIndicator>
   <veds:VehicleSeatbeltMonitoredIndicator>true
   </veds:VehicleSeatbeltMonitoredIndicator>
</veds:VehicleSeat>
<nc:VehicleUnladenWeightMeasure>
   <nc:MeasurePointValue>
      600
      </nc:MeasurePointValue>
   <nc:MeasureUnitText>
      kilogram
   </nc:MeasureUnitText>
</nc:VehicleUnladenWeightMeasure>
</veds:CrashVehicle>
<veds:FuelLeakingIndicator>
    true
</veds:FuelLeakingIndicator>
```

```
        <veds:MultipleImpactsIndicator>
            false
        </veds:MultipleImpactsIndicator>
        <veds:SevereInjuryIndicator>
            true
        </veds:SevereInjuryIndicator>
        <veds:VehicleFinalRestOrientationCategoryCode>
            Driver
        </veds:VehicleFinalRestOrientationCategoryCode>
        <veds:VehicleFireIndicator>
            false
        </veds:VehicleFireIndicator>
    </veds:Crash>
</veds:AutomatedCrashNotification>
```

4.2 Example 2 (More Extensive)

The following is a more extensive example:

```
<?xml version="1.0" encoding="UTF-8"?>
<veds:AutomatedCrashNotification xmlns:s="http://niem.gov/niem/structures/2.0"
xsi:schemaLocation="http://www.veds.org/acn/3.1 ../Schema/veds/3.1/veds.xsd"
xmlns:j="http://niem.gov/niem/domains/jxdm/4.1"
xmlns:m="http://niem.gov/niem/domains/maritime/2.1" xmlns:nc="http://niem.gov/niem/niem-
core/2.0" xmlns:veds="http://www.veds.org/acn/3.1"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <!-- Addional Details Text -->
    <nc:DocumentDescriptionText>
        Vehicle accident 2018-01-04
    </nc:DocumentDescriptionText>
    <nc:DocumentPostDate>
        <!-- Transmission Date Time -->
        <nc:DateTime>2018-01-04T02:29:00.0Z</nc:DateTime>
    </nc:DocumentPostDate>
    <nc:DocumentReceivedDate>
        <!-- Received Date/Time -->
        <nc:DateTime>2018-01-04T02:30:00.0Z</nc:DateTime>
    </nc:DocumentReceivedDate>
    <!-- Event Verified Indicator -->
    <veds:EventVerifiedIndicator>true</veds:EventVerifiedIndicator>
    <veds:ContactActivity>
        <nc:ActivityDate>
            <!-- Contact Date/Time -->
```

```
            <nc:DateTime>2018-01-04T02:29:35.0Z</nc:DateTime>
         </nc:ActivityDate>
         <nc:ContactTelephoneNumber>
            <nc:FullTelephoneNumber>
               <!-- Contact Activity Telephone Number -->
               <nc:TelephoneNumberFullID>888-555-1212
               </nc:TelephoneNumberFullID>
            </nc:FullTelephoneNumber>
         </nc:ContactTelephoneNumber>
      </veds:ContactActivity>
      <veds:ContactInformation s:id="CXT1">
         <!-- Emergency Contact Email -->
         <nc:ContactEmailID>jsponder@mail.example.com
         </nc:ContactEmailID>
         <nc:ContactTelephoneNumber>
            <!-- Emergency Contact Phone Number -->
            <nc:FullTelephoneNumber>
               <nc:TelephoneNumberFullID>602-555-1212
               </nc:TelephoneNumberFullID>
            </nc:FullTelephoneNumber>
         </nc:ContactTelephoneNumber>
         <!-- Emergency Contact Name -->
         <nc:ContactEntityDescriptionText>Janet Sponder
         </nc:ContactEntityDescriptionText>
         <veds:ContactIdentification>
            <!-- Contact ID -->
            <nc:IdentificationID>1</nc:IdentificationID>
         </veds:ContactIdentification>
      </veds:ContactInformation>
      <veds:Crash s:id="CRASH1">
         <nc:ActivityIdentification>
            <!-- Incident ID -->
            <nc:IdentificationID>CR2346</nc:IdentificationID>
         </nc:ActivityIdentification>
         <nc:ActivityDate>
            <!-- Incident Date/Time -->
            <nc:DateTime>2018-01-04T02:29:00.0Z</nc:DateTime>
         </nc:ActivityDate>
         <!-- Vehicle Passenger Quantity -->
         <j:DrivingIncidentPassengerQuantityText>2
         </j:DrivingIncidentPassengerQuantityText>
         <m:ConveyanceHeadingMeasure>
            <!-- Direction vehicle was traveling in degrees -->
```

```
544             <nc:MeasurePointValue>90</nc:MeasurePointValue>
545          </m:ConveyanceHeadingMeasure>
546          <veds:CrashPerson>
547             <nc:RoleOfPersonReference s:ref="PERS1"/>
548             <veds:CrashPersonIdentification>
549                <!-- Person ID -->
550                <nc:IdentificationID>001</nc:IdentificationID>
551             </veds:CrashPersonIdentification>
552             <!-- Person Role Category Code -->
553             <veds:CrashPersonRoleCode>PRIMARY</veds:CrashPersonRoleCode>
554          </veds:CrashPerson>
555          <veds:CrashVehicle>
556             <!-- Vehicle Primary Color -->
557             <nc:ConveyanceColorPrimaryText>Red
558             </nc:ConveyanceColorPrimaryText>
559             <!-- Vehicle Secondary Color -->
560             <nc:ConveyanceColorSecondaryText>Black
561             </nc:ConveyanceColorSecondaryText>
562             <!-- Vehicle Make Name -->
563             <nc:ItemMakeName>Ford</nc:ItemMakeName>
564             <!-- Vehicle Model Name -->
565             <nc:ItemModelName>Mustang</nc:ItemModelName>
566             <!-- Vehicle Model Year -->
567             <nc:ItemModelYearDate>2018</nc:ItemModelYearDate>
568             <nc:ConveyanceRegistrationPlateIdentification>
569                <!-- Vehicle Plate Number -->
570                <nc:IdentificationID>ABC123</nc:IdentificationID>
571                <!-- Vehicle Plate State -->
572                <nc:IdentificationJurisdictionText>Kansas
573                </nc:IdentificationJurisdictionText>
574             </nc:ConveyanceRegistrationPlateIdentification>
575             <!-- Vehicle Interior Color -->
576             <nc:VehicleColorInteriorText>Gray
577             </nc:VehicleColorInteriorText>
578             <nc:VehicleIdentification>
579                <!-- VIN -->
580                <nc:IdentificationID>1HGS43423552234
581                </nc:IdentificationID>
582                <nc:IdentificationJurisdictionText/>
583             </nc:VehicleIdentification>
584             <veds:Airbag>
585                <!-- Airbag Category Code -->
586                <veds:AirbagCategoryCode>CURTAIN
```

```
            </veds:AirbagCategoryCode>
            <veds:AirbagDeployedIndicator>true
            </veds:AirbagDeployedIndicator>
         </veds:Airbag>
         <veds:Airbag>
            <!-- Airbag Category Code -->
            <veds:AirbagCategoryCode>CURTAIN
            </veds:AirbagCategoryCode>
            <veds:AirbagDeployedIndicator>true
            </veds:AirbagDeployedIndicator>
         </veds:Airbag>
         <!-- DOT Number -->
         <j:CommercialCarrierUSDOTNumber>0000000
         </j:CommercialCarrierUSDOTNumber>
         <!-- Vehicle Convertible Indicator -->
         <veds:ConvertibleIndicator>true
         </veds:ConvertibleIndicator>
         <nc:Image>
            <!-- Digital Image Location URI (e.g.,
             uploaded by vehicle to a service site or
             conveyed to TSP -->
            <nc:BinaryLocationURI>
https://vehicleservices.example.net/1HGS43423552234/2018-01-04T02%3A29%3A00.0Z
            </nc:BinaryLocationURI>
         </nc:Image>
         <!-- Power Source Category Code -->
         <veds:PowerSourceCategoryCode>BACKUP
         </veds:PowerSourceCategoryCode>
         <!-- Vehicle Body Type -->
         <j:VehicleBodyCategoryCode>101
         </j:VehicleBodyCategoryCode>
         <!-- Vehicle Autonomous Capability Code -->
         <veds:VehicleAutonomousModeCode>1
         </veds:VehicleAutonomousModeCode>
         <veds:VehicleCrashPulse>
            <nc:ActivityIdentification>
               <!-- Impact ID -->
               <nc:IdentificationID>001
               </nc:IdentificationID>
            </nc:ActivityIdentification>
            <veds:CrashPulseChangeInVelocityMeasure>
               <!-- Change in velocity -->
               <nc:MeasurePointValue>-32.2
```

```
                </nc:MeasurePointValue>
                <!-- Change in velocity unit -->
                <nc:MeasureUnitText>KPH</nc:MeasureUnitText>
            </veds:CrashPulseChangeInVelocityMeasure>
            <!-- Princial Direction of Force Text-->
            <veds:CrashPulsePrincipalDirectionOfForceValue>9
            </veds:CrashPulsePrincipalDirectionOfForceValue>
            <!-- Rollover quarter turns number -->
            <veds:CrashPulseRolloverQuarterTurnsValue>3
            </veds:CrashPulseRolloverQuarterTurnsValue>
        </veds:VehicleCrashPulse>
        <!-- Vehicle Human Driver Engaged Indicator -->
        <veds:VehicleHumanDriverEngagedIndicator>true
            </veds:VehicleHumanDriverEngagedIndicator>
        <!-- Vehicle Pedestrian Protection Device Deployed
             Indicator -->
        <veds:VehiclePedestrianProtectionDeviceDeployedIndicator>
             true
        </veds:VehiclePedestrianProtectionDeviceDeployedIndicator>
        <!-- Vehicle Propulsion Storage Type Codes -->
        <veds:VehiclePropulsionStorageCode>GASOLINE
        </veds:VehiclePropulsionStorageCode>
        <veds:VehiclePropulsionStorageCode>ELECTRIC
        </veds:VehiclePropulsionStorageCode>
        <!-- Vehicle Roll Bar Deployed Indicator -->
        <veds:VehicleRollbarDeployedIndicator>true
        </veds:VehicleRollbarDeployedIndicator>
        <!-- Vehicle Rollover Indicator -->
        <veds:VehicleRolloverIndicator>true
        </veds:VehicleRolloverIndicator>
        <!-- Driver Seat Info -->
        <veds:VehicleSeat>
            <!-- Seat Category Code, Front Row Middle -->
            <veds:VehicleSeatLocationCategoryCode>9
            </veds:VehicleSeatLocationCategoryCode>
            <!-- Occupied Indicator -->
            <veds:VehicleSeatOccupiedIndicator>true
            </veds:VehicleSeatOccupiedIndicator>
            <!-- Belt Fastened Indicator -->
            <veds:VehicleSeatbeltFastenedIndicator>true
            </veds:VehicleSeatbeltFastenedIndicator>
            <!-- Belt Monitored Indicator -->
        </veds:VehicleSeat>
```

```
673             <!-- Front Passenter  Seat Info -->
674             <veds:VehicleSeat>
675                <!-- Seat Category Code -->
676                <veds:VehicleSeatLocationCategoryCode>2
677                </veds:VehicleSeatLocationCategoryCode>
678                <!-- Occupied Indicator -->
679                <veds:VehicleSeatOccupiedIndicator>true
680                </veds:VehicleSeatOccupiedIndicator>
681                <!-- Belt Fastened Indicator -->
682                <veds:VehicleSeatbeltFastenedIndicator>true
683                </veds:VehicleSeatbeltFastenedIndicator>
684                <!-- Belt Monitored Indicator -->
685                <veds:VehicleSeatbeltMonitoredIndicator>true
686                </veds:VehicleSeatbeltMonitoredIndicator>
687             </veds:VehicleSeat>
688             <nc:VehicleUnladenWeightMeasure>
689                <nc:MeasurePointValue>6000
690                </nc:MeasurePointValue>
691             </nc:VehicleUnladenWeightMeasure>
692          </veds:CrashVehicle>
693          <!-- Fuel Leaking Indicator -->
694          <veds:FuelLeakingIndicator>false
695          </veds:FuelLeakingIndicator>
696          <!-- Multiple Impacts Indicator -->
697          <veds:MultipleImpactsIndicator>false
698          </veds:MultipleImpactsIndicator>
699          <!-- Severe Injury Indicator -->
700          <veds:SevereInjuryIndicator>true
701          </veds:SevereInjuryIndicator>
702          <!-- Final Rest Orientation Category -->
703          <veds:VehicleFinalRestOrientationCategoryCode>Roof
704         </veds:VehicleFinalRestOrientationCategoryCode>
705          <!-- Vehicle Fire Indicator -->
706          <veds:VehicleFireIndicator>false</veds:VehicleFireIndicator>
707       </veds:Crash>
708       <nc:Location s:id="LOC1">
709          <nc:LocationCrossStreet>
710             <!-- Cross Street Description -->
711             <nc:CrossStreetDescriptionText>
712                Enighed and FR3900
713             </nc:CrossStreetDescriptionText>
714          </nc:LocationCrossStreet>
715          <!-- Location Description -->
```

```
716         <nc:LocationDescriptionText>Near Blue Silo
717         </nc:LocationDescriptionText>
718         <nc:LocationTwoDimensionalGeographicCoordinate>
719            <!-- Datum -->
720            <nc:GeographicDatumCode>NAR-C
721            </nc:GeographicDatumCode>
722            <nc:GeographicCoordinateLatitude>
723               <!-- Latitude -->
724               <nc:LatitudeDegreeValue>
725                  37.09024
726               </nc:LatitudeDegreeValue>
727            </nc:GeographicCoordinateLatitude>
728            <nc:GeographicCoordinateLongitude>
729               <!-- Longitude -->
730               <nc:LongitudeDegreeValue>
731                  -95.712891
732               </nc:LongitudeDegreeValue>
733            </nc:GeographicCoordinateLongitude>
734         </nc:LocationTwoDimensionalGeographicCoordinate>
735      </nc:Location>
736      <veds:NotificationDestinationOrganization s:id="ORG1">
737         <nc:OrganizationIdentification>
738            <nc:IdentificationID>43</nc:IdentificationID>
739         </nc:OrganizationIdentification>
740         <!-- Agency Notified -->
741         <nc:OrganizationName>City Police</nc:OrganizationName>
742         <nc:EmployeeIdentification>
743            <!-- Employee ID -->
744            <nc:IdentificationID>234</nc:IdentificationID>
745         </nc:EmployeeIdentification>
746      </veds:NotificationDestinationOrganization>
747      <!-- Notification Device Type Code -->
748      <veds:NotificationDeviceTypeCode>AIRBAG
749      </veds:NotificationDeviceTypeCode>
750      <veds:NotificationOriginatingOrganization>
751         <nc:OrganizationIdentification>
752            <!-- Incident Originator Organization ID -->
753            <nc:IdentificationID>VEDS</nc:IdentificationID>
754         </nc:OrganizationIdentification>
755         <!-- Provider Name -->
756         <nc:OrganizationName>SafeKarSystems</nc:OrganizationName>
757         <nc:EmployeeIdentification>
758            <!-- Incident Originator Employee ID -->
```

```
            <nc:IdentificationID>323</nc:IdentificationID>
         </nc:EmployeeIdentification>
         <!-- Incident Originator Indicator -->
         <veds:IncidentOriginatorIndicator>true
         </veds:IncidentOriginatorIndicator>
         <!-- Originator Category Code -->
         <veds:VEDSNotificationOriginatorCode>ROADSIDE
         </veds:VEDSNotificationOriginatorCode>
      </veds:NotificationOriginatingOrganization>
      <veds:Person s:id="PERS1">
         <nc:PersonBirthDate>
            <!-- Date of Birth -->
            <nc:Date>2001-04-02</nc:Date>
         </nc:PersonBirthDate>
         <nc:PersonName>
            <!-- Person Full Name -->
            <nc:PersonFullName>Jamie Doe</nc:PersonFullName>
         </nc:PersonName>
         <nc:PersonPrimaryLanguage>
            <nc:LanguageName/>
         </nc:PersonPrimaryLanguage>
         <!-- Sex -->
         <nc:PersonSexCode>M</nc:PersonSexCode>
         <nc:DriverLicense>
            <nc:DriverLicenseIdentification>
               <!-- Driver License Number -->
               <nc:IdentificationID>KS-123456
               </nc:IdentificationID>
               <!-- Driver License State -->
               <nc:IdentificationJurisdictionText>Kansas
               </nc:IdentificationJurisdictionText>
            </nc:DriverLicenseIdentification>
         </nc:DriverLicense>
         <!-- Hearing Impaired Indicator -->
         <veds:PersonHearingImpairedIndicator>false
         </veds:PersonHearingImpairedIndicator>
         <!-- Mobility Impaired Indicator -->
         <veds:PersonMobilityImpairedIndicator>false
         </veds:PersonMobilityImpairedIndicator>
         <!-- Other Conditions Text -->
         <veds:PersonOtherConditionsText>
         </veds:PersonOtherConditionsText>
         <!-- Speech Impaired Indicator -->
```

```
802         <veds:PersonSpeechImpairedIndicator>false
803         </veds:PersonSpeechImpairedIndicator>
804       </veds:Person>
805       <j:ActivityLocationAssociation>
806         <nc:ActivityReference s:ref="CRASH1"/>
807         <nc:LocationReference s:ref="LOC1"/>
808       </j:ActivityLocationAssociation>
809       <nc:OrganizationContactInformationAssociation>
810         <nc:OrganizationReference s:ref="ORG1"/>
811         <nc:ContactInformationReference s:ref="CXT1"/>
812       </nc:OrganizationContactInformationAssociation>
813   </veds:AutomatedCrashNotification>
```

814

ACRONYMS AND ABBREVIATIONS

AACN	Advanced Automatic Collision (or Crash) Notification
ACN	Automatic Collision (or Crash) Notification
ANS	American National Standards
ANSI	American National Standards Institute
APCO	Association of Public Safety Communications Officials
ECC	Emergency Communications Center (preceded by PSAP)
EMS	Emergency Medical Services
ID	Identification
IP	Internet Protocol
ITU-T	International Telecommunication Union — Telecommunication Standardization Sector
MPH	Miles per Hour
NAD83	North American Datum 83
NENA	National Emergency Number Association
NG9-1-1	Next Generation 9-1-1
NLETS	National Law Enforcement Telecommunications System (also-known-as The International Justice and Public Safety Network)
NPA	Number Plan Area (also referred to as an area code)
NXX	Exchange, a three-digit number that follows an NPA (area code) in a North American 10-digit phone number
PSAP	Public Safety Answering Point (term replaced by ECC)
SDC	Standards Development Committee
SIP	Session Initiation Protocol
TSP	Telematics Service Provider
USDOT	United States Department of Transportation
UTC	Universal Time Coordinate
VIN	Vehicle Identification Number
WGS84	World Geodetic System 84

844	**XML**	Extensible Markup Language

845

GLOSSARY

MULTIMEDIA: The ability to establish one or more forms of interactive or non-interactive media (e.g., real-time text, audio, video) for communication. Interactive media is used for interactive communications, i.e., by the parties on the call to speak, hear, exchange real-time or message-at-a-time text, use sign language in a video stream, etc. Non-interactive media includes static or streaming audio, video, images, etc.

NG9-1-1: Next-Generation 9-1-1 is an update of the 9-1-1 system that uses Internet protocols such as SIP rather than legacy circuit-switched protocols such as Signaling System 7 (SS7). NG9-1-1 is an end-to-end system from a caller to an ECC, with access by downstream responders. An NG9-1-1 call may transit legacy gateways at various points, e.g., if the originating device or terminating ECC does not support NG9-1-1. An NG9-1-1 call from an originating device typically connects to an origination network, which routes the call to a set of Next-Generation Core Services (NGCS) elements providing security, call routing, and other emergency call services within an Emergency Services IP Network (ESInet). NG9-1-1 replicates traditional E9-1-1 features and functions using modern technology, which provides significant additional capabilities, much faster call setup and processing, and greatly enhanced interoperability and resiliency. NG9-1-1 is designed to provide access to emergency services from all connected communications sources and provide multimedia and data capabilities for Emergency Call Centers (ECCs)/Public Safety Answering Points (PSAPs) and other emergency service organizations.

SESSION INITIATION PROTOCOL (SIP): an IETF protocol (RFC 3261[16] et al) that specifies a method for establishing calls using modern communication techniques. SIP is frequently deployed within large organizations for telecommunications and is used by many (if not most) telephony providers internally as well as in many cases for interconnection. SIP enables calls with interactive multimedia, such as voice, video, real-time text, message-at-a-time text, and multimedia conference sessions. SIP is the call signaling protocol in NG9-1-1.

[16] RFC 3261.

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