ITS JPO Research Data Submission data.transportation.gov

Purpose

The purpose of this document is to provide a series of steps for data providers that are looking to post new data to the previous Research Data Exchange (RDE) system which is now the ITS Public Data Hub. These steps are design to meet the following two goals:

1. Provide an easy and clear process to provide the data to the USDOT to meet contract requirements
2. Provide enough information about the data so other researchers and application developers can use it and understand it.

When preparing the data consider that new users of the data may have very little understanding of the context for which the data was collected and provided. Please spell out acronyms for the project, provide background on the data, and be sure to include any information you think may be useful to outside users of the data. When in doubt provide more information than less to help ensure your data is useful to others.

Here are a few examples of how the data will look on the system:
- https://data.transportation.gov/Automobiles/Pasadena-Test-Data-Sets/xig6-cb63
- https://data.transportation.gov/dataset/Southeast-Michigan-Operational-Data-Environment-SE/tw8w-mfxe

❶ Metadata Requirements

A. Please fill out the "MetadataTemplate.doc" document with the metadata for your project's data. You can refer to the example metadata in the Appendix section below for guidance. If you have already have metadata in this format, you do not need to complete the "MetadataTemplate.doc" document.
B. Please rename the "MetadataTemplate.doc" document with the name of your project. For example, "Basic Safety Message Metadata.doc"

❷ Formatting for data.transportation.gov (DTG)

A. Each data file needs to be less than 1 GB.
- For small datasets, combine similar data together, when possible.

- For large datasets, separate the data into files `that are, at most, 1 GB. Label the file with the dataset name and appropriate category which could include date, format type, or other contextual information. For example, "Basic Safety Message Part 1" or "Traveler Information Msg-20171129".

③ Sending Data

A. Zip the data files, where possible.

B. Please use a method to send the files that is effective for the size of the data.

C. Please send the following items to data.itsjpo@dot.gov:
- Zip file(s) of data either directly attached or instructions on how to download. Zip file(s) should be named in a manner understandable to users not intimately familiar with the data set.
- Completed "MetadataTemplate.doc" document or other metadata file, renamed with your project name in the file name and attach to email.
- Any associated documentation that describes any data transformation, aggregation, or sanitization processes run on the raw data to get to the data set being delivered.

Appendix: Metadata Example

POC RSE Parsed Processed Data from the Prototype Data Environment Portal

Identification Information
  Citation
    Citation Information
      Originator: Noblis processed the original data captured by Booz Allen Hamilton Inc.
      Publication Date: 20100422
      Title: Proof of Concept (POC) Roadside Equipment (RSE) Parsed Data
      Publication Information
        Publication Place: Washington, DC
        Publisher: Noblis
      Online Linkage: **https://datacapture.noblis.org/content/poc-rse-parsed-data**
      Larger Work Citation
        Citation Information
          Originator: Noblis
          Publication Date: 201004
          Title: Prototype Data Environment Test Bed
          Online Linkage: **https://datacapture.noblis.org/content/prototype-data-environment-vehicle-vehicle-v2v-and-vehicle-infrastructure-v2i-technology-tes**

Description
  Abstract: As the vehicles are driven along the road, the Onboard Equipment (OBE) units installed on vehicles log vehicle and environmental information, record "snapshots" of this information, and transmit the snapshots to a Roadside Equipment (RSE), using Dedicated Short-range Communications (DSRC) protocol and the SAE J2735 standard for probe messages. This data set contains the vehicle and environmental data that was received on RSEs installed along roadways.

  In 2005 the United State Department of Transportation (USDOT) initiated the Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) Technology Test Bed facility in the northwest suburbs of Detroit, Michigan to develop and test 5.9 GHz communications in support of the connected vehicle research. The major components of the Development Test Environment (DTE) are OBE installed on vehicles, and RSE installed along roadways. The vehicles act as probes.

  At designated events defined by the SAE J2735 standard, the OBE takes a snapshot that is a record of the values of certain variables at the instant the snapshot was taken. When the

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vehicle comes within transmission range of an RSE (normally 1 km), the OBE generate and transmits one or more messages. Each message can contain up to four messages.

The first major set of trials conducted at the DTE was the Proof of Concept (POC) trials during 2008. The POC trials featured fifty-two RSEs within 45 square miles, 27 vehicles configured with OBEs, and a Dedicated Short-Range Communications (DSRC) network. RSE data for the public application tests were available for eight days in August 2008. These six days were chosen for inclusion in the data environment because the first and last days had much higher number of duplicate records and questionable data values.

Purpose: The contents of an RSE file, with a few exceptions, follow the format of a data probe message specified in Version 17A of the SAE J2735 standard. J2735 messages are transmitted in Abstract Syntax Notation (ASN.1) format using Basic Encoding Rules (BER) to minimize the bandwidth required. However, BER files are not human readable and are not machine-readable without an expensive "translation" program. The original data collector has provided a direct "translation" of the BER files to XML format. To make the POC data more accessible to researchers, under the USDOT Data Capture and Management Program, Noblis developed a program to parse the XML files and to create comma-separated value (CSV) versions of the RSE data, which are easier to use than the original XML version of files. Each message header and each snapshot appears on one line, and individual values are separated by commas. There is one file for each date, containing all messages received by all RSEs.

Supplemental Information**:** The data fields including flags are described in the RSE documentation and RSE field values documentation on https://datacapture.noblis.org/content/rse-file-documentation. The files representing the RSEs location are available on https://datacapture.noblis.org/content/poc-rse-locations. The xls file is a spreadsheet that lists the latitude and longitude of each RSE. The ppt file shows the RSE locations superimposed on a map of the area where the trials took place. The kml file can be read by Google Earth or Google Maps to display the RSE locations, labeled with RSE numbers.

Time Period of Content
 Time Period Information
  Multiple Dates/Times
    Calendar Date: 20080821
    Calendar Date: 20080822
    Calendar Date: 20080825
    Calendar Date: 20080826
    Calendar Date: 20080827
    Calendar Date: 20080828
 Currentness Reference: Ground Condition"
Status
 Progress: Complete
 Maintenance and Update Frequency: None Planned
Spatial Domain
 Bounding Coordinates
  West Bounding Coordinate: -83.65
  East Bounding Coordinate: -83.11
  North Bounding Coordinate: 45.55
  South Bounding Coordinate: 42.35
Keywords
 Theme
  Theme Keyword Thesaurus: None
  Theme Keyword: Proof of Concept (POC)
  Theme Keyword: Vehicle-to-Vehicle
  Theme Keyword: Vehicle-to-Infrastructure
  Theme Keyword: Test bed
  Theme Keyword: Onboard Equipment (OBE)

Theme Keyword: Roadside Equipment (RSE)
Theme Keyword: Dedicated Short-range Communication (DSRC)
Place
　Place Keyword Thesaurus: None
　Place Keyword: Michigan
　Place Keyword: Detroit
Temporal
　Temporal Keyword Thesaurus: None
　Temporal Keyword: 2008
　Temporal Keyword: August
Access Constraints: To access the dataset, users must register through the portal
https://datacapture.noblis.org/user/register. The registration process will include a request for
contact information, information about how a user plans to use the connected vehicle data,
what members are also working on the project, and any other related information that help
describe their work. What information is optional versus mandatory for registration has not
been determined; however in order to encourage broad access and use, mandatory
information will be kept to a minimum and ease of use maximized.
User Constraints: Users have the following responsibilities:
1. Where the contributed materials have been utilized to any extent to enable, verify,
    supplement or validate performance measurement, analysis, research or software
    development, to fully reference the Data Capture and Management Program and the
    contributions of the individuals in all subsequent and related publications or public events,
    specifically:
    *   An publications, reference the Data Capture and Management website and the date
        accessed, data and/or data processing tools (by name and version number), and the
        individual contributors identified on the reference template associated with each data
        and/or data processing tool.
    *   In presentations or other oral communication, by noting the data and/or data processing
        tool by name and version number, and communicating the address of the Data Capture
        and Management website.
2. To accurately post and update within the Data Capture and Management website a
    description of the project utilizing the data and/or the data processing tools, including:
    *   A description of the project, including a brief statement of the project goals.
    *   A summary of the hypotheses and findings (when available) of the project.
    *   Individuals directing and/or substantively participating in the project.
    *   The name and version number of the data and/or data processing tools downloaded
        and utilized in the project.
    *   The current state of the project (upcoming, underway, completed).
    *   References to published materials (if any).
3. To report anomalies, errors or other questionable data elements using the Data Forum of
    the Data Capture and Management website, referencing the specific data or data
    processing tool by name and version number.
4. To refrain from duplication and dissemination of the data and data processing tools to third
    parties.

Point of Contact
　Contact Information
　　Contact Organization Primary
　　　Contact Organization: Noblis
　　　Contact Person: Rick Glassco
　　Contact Electronic Mail Address: Richard.Glassco@noblis.org
Data Set Credit: USDOT V2V/V2I Technology Test Bed
Native Data Set Environment: In 2005 the United State Department of Transportation (USDOT)
　　initiated the Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) Technology Test
　　Bed facility in the northwest suburbs of Detroit, Michigan to develop and test 5.9 GHz

communications in support of the connected vehicle research. The major components of the Development Test Environment (DTE) are Onboard Equipment (OBE) installed on vehicles, and Roadside Equipment (RSE) installed along roadways. The vehicles act as probes.

As the vehicles are driven around the testbed, the OBE units log vehicle and environmental information, record "snapshots" of this information, and transmit the snapshots to the RSEs, using Dedicated Short-range Communications (DSRC) protocol and the SAE J2735 standard for probe messages. The RSE passes the received messages to a Service Delivery Node (SDN), from which point they become available to connected vehicle applications.

The first major set of trials conducted at the DTE was the Proof of Concept (POC) trials during 2008. The POC trials featured fifty-two RSEs within 45 square miles, 27 vehicles configured with OBEs, and a Dedicated Short-Range Communications (DSRC) network. The testing program had three major phases: subsystem test, system integration and test, and public and private applications test. The public application testing portion of the POC trials were conducted during August 2008. RSE data for the public application tests were available for eight days in August 2008. The data in this prototype data environment consists of RSE and OBE data for the middle six of these days. These six days were chosen for inclusion in the data environment because the first and last days had much higher number of duplicate records and questionable data values.

In April 2009 a second set of trials was conducted at the testbed, directed by the National Center for Atmospheric Research (NCAR). These trials used a smaller set of vehicles, and concentrated on collecting data during periods of rainy or snowy weather. RSE data for the NCAR 2009 tests were available for nine days in April 2009. The data in this prototype data environment consists of RSE and OBE data for the best six days.

In late January through early April 2010 a third set of trials was conducted at the IMT, again directed by the National Center for Atmospheric Research (NCAR). These trials used a small set of vehicles, similar to the trials in 2009, and concentrated on comparing atmospheric data from vehicle-mounted sensors to data from a nearby fixed weather observing station. The 2010 data selected for inclusion in this prototype data environment consists of RSE and OBE data for the best six days.

There are four types of file in this prototype data environment
- **Raw Data:** The RSE XML files and the OBE log files are available with the same format and contents as originally available from the testbed operators. No changes have been made to these files. Parsed RSE files are also included with the raw data, because no data has been omitted, just formatted for easier use.
- **Processed Data:** These files have been created as subsets of the raw data files, and formatted for easier processing. In the case of RSE file files, duplicate records have been deleted and data quality flags have been added. In the case of OBE files, three data subsets have been extracted: events, snapshots, and trajectory information.
- **Documentation:** The documentation files consist of text files describing RSE and OBE operation and the contents of the RSE and OBE files. Spreadsheets providing definitions and units for each of the data fields in the raw and processed data files are also included in the documentation section.
- **Supplemental Data:** Supplemental data files contain additional information relevant to the data collection periods, such as weather data and a simulation of the probe message generation and transmission process. These files are not available in the initial version of the website, but will be added in the coming few months.

This Parsed Processed data set was produced on an Intel-based PC with Window XP, using Word 2007, Excel 2007, and Python 6.3. The data set size for the six days is 16.27MB.

Cross Reference

Citation Information
   Originator: Noblis
   Publication Date: 201004
   Title: POC RSE Locations
   *Online Linkage***: https://datacapture.noblis.org/content/poc-rse-locations**
Citation Information
   Originator: Booze Allen Hamilton
   Publication Date: 200808
   Title: POC RSE XML Files
   *Online Linkage***: https://datacapture.noblis.org/content/poc-rse-xml-files**
Citation Information
   Originator: Noblis
   Publication Date: 201004
   Title: RSE File Documentation
   *Online Linkage***: https://datacapture.noblis.org/content/rse-file-documentation**
Citation Information
   Originator: Noblis
   Publication Date: 201004
   Title: POC RSE Parsed Processed Data
   *Online Linkage***: https://datacapture.noblis.org/content/poc-rse-parsed-processed-data**

Data Quality Information
Attribute Accuracy: No accuracy assessment has been performed for the data set.
Logical Consistency Report: Following logical consistency rules were generated to check the logical consistency of the data set.

- A message should be received once by one RSE. Multiple RSEs cannot receive a same message. Snapshots should be recorded once in a message and received by one RSE.
- The location where a message was transmitted should be within 1 km radius of the RSE location that the message was captured.
- The time when a snapshot was recorded must be earlier than the time (in the message header) when the message that contains the snapshot was generated.
- The time (in the message header) when a message was generated must earlier than the time (shown in the file name) when the message was received at a RSE.
- The lag between the time when a snapshot was taken and the time when the snapshot was transmitted should be less than 60 minutes.
- Speed should be in a reasonable.
- Compared to the maximum of the day archived by National Oceanic and Atmospheric Administration (NOAA), the air temperature is expected to be less than the maximum temperature of the day plus 10°C.

Noblis removed all duplicate messages and duplicate snapshots from the RSE parsed data files and performed data quality analysis using the proposed consistency rules. Noblis created a set of processed RSE files by adding data quality flags to an extra column. The processed RSE files locate in the same data environment (https://datacapture.noblis.org/content/poc-rse-parsed-processed-data).

Data Quality Flags

Key	Variable	Value if capital	Value if lower case
Ss	Speed	Greater than 150 mph	Greater than 90 mph
Ll	Location where the message was sent	Latitude and longitude are 5°	Location is greater than 1 km from RSE location

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Aa	Air temperature	10° or more higher than the max air temp of the day	Greater than the max air temp of the day, but less than the max air temp of the day + 10°
Tt	Time between snapshot taken and when it was transmitted	Time lag greater than 60 minutes	Time lag between 30 minutes and 60 minutes

Completeness Report: Logically, it is expected that a message should be received once by one RSE, and a snapshot should be recorded once in a message and received by one RSE. According to the logical consistency report, 40% of data were deleted from the original RAW data set.

Lineage
  Source Information
    Source Citation
       Citation Information
         Originator: Noblis processed the original data captured by Booz Allen Hamilton Inc.
         Publication Date: 2008
         Title: Proof of Concept (POC) Roadside Equipment (RSE) XML Data
         *Online Linkage***:** https://datacapture.noblis.org/content/poc-rse-xml-files
  Process Step
    Process Description: To generate the data set, Noblis performed the following process. The RSE raw data files are downloaded from the connected vehicle Michigan Testbed Data environment. There is a zipped file for each day. When a file is unzipped, a directory is created for that day. Inside that directory is a directory for each RSE. Inside each directory is a file for each message received by that RSE during that day. The name of the file contains the time at which the message was received. Noblis developed a Python program to parse the XML files and to create comma-separated value (CSV) versions of parsed RSE data. There is one file containing all the RSE data from each day.

    Noblis made a few changes in the files to facilitate further processing. The changes are described as follows:
- Each RSE header and each snapshot was converted into one row (record) in the file.
- The RSE ID, date, and the name of the file were included as elements in each row. Thus each row can be traced to the RSE file from which the data was extracted. The message header and each snapshot appearing in one file have the same RSE number, date, and file name.
- The three elements of the date appearing in the message header and each of the snapshots (i.e., year, month, and day) were combined into one element with the format MM/DD/YYYY. Having the date as one field facilitates processing in a database or spreadsheet.
- The three elements of the time appearing in the message header and each of the snapshots (i.e., hour, minute, and second) were combined into one element with the format HH:MM:SS. Having the time as one field facilitates processing in a database or spreadsheet.
- In the snapshot number field, a value of '0' indicates the message header. Otherwise this field indicates the order of the snapshot in the message. Snapshot #1 is always the most recent snapshot, snapshot #2 is the next most recent, and so on.
- The OBE ID number was extracted from the serial number header and inserted into the record for the message header and each snapshot taken by the same vehicle.

Applications developers should note that this value is <u>not</u> available to connected vehicle applications.

- There is a field for each possible data element. In the original XML format, certain data elements such as airTemp or barPress may not be present at all. The commas in the CSV files are necessary to designate each field correctly, and missing values are treated as nulls.
- The data element names <on>, <off>, and <notEquipped> were treated as character strings (as defined in the J2735 standard), not data element names.
- The bit strings for lights and brakes were converted to character strings of 1s and 0s.

Process Contact:
Contact Information
Contact Organization Primary
Contact Organization: Noblis
Contact Person: Rick Glassco
Contact Electronic Mail Address: Richard.Glassco@noblis.org

Entity and Attribute Information
Detailed Description
Attribute
Attribute Label: RSE #
Attribute Definition: The RSE location number where the data of the row was recorded.
Attribute Definition Source: The RSE locations are named in positive integer numbers and the detailed location information is available on https://datacapture.noblis.org/content/poc-rse-locations.
Attribute Value Accuracy Information
Attribute Value Accuracy Explanation: The RSE locations are all represented in in the POC_RSE_Location.xls on https://datacapture.noblis.org/content/poc-rse-locations.
Attribute
Attribute Label: File_date
Attribute Definition: RSE Date Stamp – represents the date when the message was recorded on the RSE. The date was extracted from the zipfile name. The format of File_Date is MM/MM/YYYY.
Attribute Value Accuracy Information
Attribute Value Accuracy Information: The File_date must match to the file name containing the data.
Attribute
Attribute Label: File_Name
Attribute Definition: RSE Time Stamp- represents the time when the message was recorded on the RSE and was extracted from the XML file name. The format of File_name is HH.MM.SS.000(-x). When more than one message is received within the same second, files after the first one include the suffix "-1", "-2" etc. The time is recorded using Coordinated Universal Time (UTC). UTC is also known as Greenwich Mean Time (GMT).
Attribute
Attribute Label: Date
Attribute Definition: Combined from message header or snapshot year, month, and date fields. The format of Date is MM/DD/YYYY. If the row represents a snapshot, the date is when the snapshot was taken. If the row represents the header of a message, the date is when the message was generated.
Attribute
Attribute Label: Time
Attribute Definition: Combined from message header or snapshot hour, minute, and second fields. The format of Time is HH/MM/SS. If the row represents a snapshot, the time is when the snapshot was taken. If the row represents the header of a message, the time is

when the message was generated. The time is recorded using Coordinated Universal Time (UTC). UTC is also known as Greenwich Mean Time (GMT).

Attribute
  Attribute Label: SS #
  Attribute Definition: Snapshot number representing order of snapshots. A value of '0' indicates the message header. Message header contains the information on the time, location, and vehicle status that the message was sent.
   Attribute Domain Values
    Range Domain
     Range Domain Minimum: 0
     Range Domain Maximum: 4

Attribute
  Attribute Label: Serial Number
  Attribute Definition: OBE ID number extracted from the serial number header and inserted into the record for the message header. The serial numbers are recorded in the character format.
  Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute
  Attribute Label: Lat
  Attribute Definition: The degrees latitude of the location and the unit is 1/8000000, i.e. 1/8 of a microdegree, using the WGS-84 coordinate system. The data format is integer.
  Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute
  Attribute Label: Long
  Attribute Definition: The degrees longitude of the location and the unit is 1/8000000, i.e. 1/8 of a microdegree, using the WGS-84 coordinate system. The data format is integer.
  Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute
  Attribute Label: Elevation
  Attribute Definition: The Elevation is the height of a geographic location above mean sea level. The Elevation shall be taken from the spatial center of the vehicle, when a vehicle is being measured. The value of zero shall be used when an unknown elevation must be sent. When SS#=0 (that means it is the message header), the Elevation attribute is expected to have a value outside the domain range.
  Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory
  Attribute Domain Values
    Range Domain
     Range Domain Minimum: -405.9 meters
     Range Domain Maximum: 6143.9 meters

Attribute
  Attribute Label: Heading
  Attribute Definition: The current heading of the vehicle expressed in unsigned units of 0.005493247 degrees from North. The Heading is being represented in integers. . When SS#=0 (that means it is the message header), the Heading attribute is expected to have a value outside the domain range.
  Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory
  Attribute Domain Values
    Range Domain
     Range Domain Minimum: 0

Range Domain Maximum: 32757

Attribute

  Attribute Label: Speed

  Attribute Definition: The vehicle speed expressed in unsigned units 0.01 meters per second. The Speed is being represented in integer.

  Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

  Attribute Domain Values

    Range Domain

      Range Domain Minimum: 0

      Range Domain Maximum: 32765

Attribute

  Attribute Label: cntVSDTs

  Attribute Definition: The cntVSDTs represents the count of Vehicle Status Device Type (VSDTs) that follow. VSDTs are the same as the <SnapshotItem> elements within the snapshot (i.e. the number of data fields that follow in the row).

  Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute

  Attribute Label: PSN

  Attribute Definition: Probe Segment Number (PSN) is randomly generated by a vehicle every 120 seconds or 1 km, whichever comes first, to make it impossible to identify a single vehicle trajectory. However, it can be used to identify vehicle trajectory for a limited amount of time or a limited distance. PSN numbers are presented as integers.

  Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute

  Attribute Label: Lights

  Attribute Definition: The status of various exterior lights encoded in a bit string which can be used to relate the current vehicle settings. Counting the rightmost bit as bit 1, the following defines the meaning of each bit (the light is on if the bit is '1')

      1 -   Low beam head light

      2 -   High beam head light

      3 -   Left turn signal

      4 -   Right turn signal

      3&4 – Hazard signal (blinkers)

      5 -   Automatic light control

      6 -   Daytime running lights

      7 -   For lights

      8 -   Parking lights

  Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute

  Attribute Label: Brake_Status

  Attribute Definition: The Blake_Status specifies which brakes are engaged and is being represented in a bit string enumerating the status of various brake systems of the vehicle. Counting a rightmost bit as bit 1, the following list defines the meaning of each bit (the brake is engaged if the bit is '1'):

      1 -   Left front

      2 -   Left rear

      3 -   Right front

      4 -   Right rear

Attribute

  Attribute Label: Brake_Boost

Attribute Definition: The Brake_Boost reflects the engagement of the vehicle's brake boost assist function. The possible values are <on/>, <off/>, or <notEquipped>.
Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute
Attribute Label: ABS
Attribute Definition: The ABS reflects the current status of the Anti-Lock brake System status. The ABS status may have the values <on/>, <off/>, <engaged/>, or <notEquipped/>.
Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute
Attribute Label: Stability
Attribute Definition: The Stability represents the vehicle's stability control system status. The data is correlated with wheel speed, steering angle and acceleration position. The possible values are <on/>, <off/>, or <notEquipped>.
Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute
Attribute Label: Tracking
Attribute Definition: The status of the vehicle's traction control system is being represented with values as the choice of strings <on/>, <off/>, <engaged/>, or <notEquipped>.
Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute
Attribute Label: Yaw
Attribute Definition: This YAW reports the amount of a vehicle's rotation about its longitudinal axis within a certain time period by measuring a vehicle's angular velocity around its vertical axis. The vehicle's yaw rate is expressed in units of 0.01 degree per second. A positive value is to the right, and a negative value is to the left.
Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute
Attribute Label: Steering_Angle
Attribute Definition: The angle of the steering wheel in units of 0.2 degrees. A positive number indicates turn to the right, and a negative number indicate turn to the left.

Attribute
Attribute Label: Steering_Rate
Attribute Definition: The rate of change of the angle of the steering wheel, expressed in signed units of 3 degree/second over a range of 381 degrees in either direction. Rightward movement is positive.
Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute
Attribute Label: Wheels
Attribute Definition: The angle of the front wheels of the vehicle, in units of 0.3333 degrees and a range of plus or minus 42.33 degrees. A positive number indicates turn to the right, and a negative number indicates turn to the left.
Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute
Attribute Label: hozAccelLat

Attribute Definition: The horizontal lateral acceleration in units of 0.01 meters per second squared. Lateral acceleration is the acceleration along Y-axis or perpendicular to the vehicle's direction of travel in parallel with a left-to right centerline.

Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute

Attribute Label: hozAcceLong

Attribute Definition: The horizontal longitudinal acceleration in units of 0.01 meters per second squared. Longitudinal acceleration is the acceleration along X-axis or the vehicle's direction of travel in parallel with a front to rear centerline. Negative values indicate braking action.

Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute

Attribute Label: tirePress_lf

Attribute Definition: Indication of the air pressure in the left front tire. The unit for this data is pounds per square inch.

Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute

Attribute Label: tirePress_rf

Attribute Definition: Indication of the air pressure in the right front tire. The unit for this data is pounds per square inch.

Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute

Attribute Label: tirePress_lr

Attribute Definition: Indication of the air pressure in the left rear tire. The unit for this data is pounds per square inch.

Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute

Attribute Label: tirePress_rr

Attribute Definition: Indication of the air pressure in the right rear tire. The unit for this data is pounds per square inch.

Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute

Attribute Label: tirePress_spr

Attribute Definition: Indication of the air pressure in the spare tire. The unit for this data is pounds per square inch.

Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute

Attribute Label: front_ww

Attribute Definition: The current status of the wiper system on the front of the vehicle. The possible values for this data field are <off/>, <intermittent/> ,<low/>, <high/>, <notEquipped/>, and <automaticPresent/>.

Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC) Message Set Directory

Attribute

Attribute Label: rear_ww

Attribute Definition: The current status of the wiper system on the rear of the vehicle. The possible values for this data field are <off/>, <intermittent/> ,<low/>, <high/>, <notEquipped/>, and <automaticPresent/>.

Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC)
Message Set Directory
Attribute
Attribute Label: ww_rate
Attribute Definition: The current rate at which wiper sweeps are taking place on the vehicle.
In units of sweeps per minute. The value is being represented in integers.
Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC)
Message Set Directory
Attribute Domain Values
Range Domain
Range Domain Minimum: 0
Range Domain Maximum: 127

Attribute
Attribute Label: airTemp
Attribute Definition: The ambient air temperature from a vehicle or other device. The units
are degrees Centigrade, with an offset of -40 degree and are being represented
in integers. For example a temperature of 20° C is shown as 60.
Attribute Definition Source: SAE J2735 Dedicated Short Range Communications (DSRC)
Message Set Directory
Attribute Domain Values
Range Domain
Range Domain Minimum: 0
Range Domain Maximum: 191
Attribute
Attribute Label: barPress
Attribute Definition: The barometric pressure specified in units of hectoPascals (same as
millibars) with an offset of 580.

Distribution Information
Distributor
Contact Information
Contact Organization Primary
Contact Organization: Noblis
Contact Electronic Mail Address:James.Larkin@noblis.org

Metadata Reference Information
Metadata Date: 20110916
Metadata Review Date: 20110930
Metadata Future Review Date: not scheduled
Metadata Contact
Contact Information
Contact Organization Primary
Contact Organization: Noblis
Contact Person: Soojung Jung
Contact Electronic Mail Address: soojung.jung@noblis.org
Metadata Standard Name: FGDC Content Standard for Digital Geospatial Metadata
Metadata Standard Version: **FGDC-STD-001-1998**
Metadata Time Convention: Local time

If you have any questions, please contact: data.itsjpo@dot.gov