

Translated English of Chinese Standard: YD/T3709-2020
www.ChineseStandard.net → Buy True-PDF → Auto-delivery.
Sales@ChineseStandard.net

YD

COMMUNICATION INDUSTRY STANDARD
OF THE PEOPLE'S REPUBLIC OF CHINA

ICS 33.060.30

M30

YD/T 3709-2020

**Technical requirements of message layer of LTE-
based vehicular communication**

基于 LTE 的车联网无线通信技术消息层技术要求

Issued on: April 16, 2020

Implemented on: July 01, 2020

Issued by: Ministry of Industry and Information Technology of PRC

Table of Contents

Foreword.....	3
1 Scope.....	4
2 Normative references.....	4
3 Terms, definitions, abbreviations.....	5
3.1 Terms and definitions	5
3.2 Abbreviations.....	5
4 Message layer of LTE-based vehicular communication technology.....	6
4.1 System introduction.....	6
4.2 Architecture of message layer	7
5 Technical requirements for the message layer.....	8
5.1 Basic introduction and requirements of the message layer.....	8
5.2 Definition of data set of message layer	8
Appendix A (Informative) Type and value of DE_EventType (traffic event index)	99

Technical requirements of message layer of LTE-based vehicular communication

1 Scope

This standard specifies the technical requirements for the message layer of LTE-based vehicular communication technology, which specifically includes the structure of the data set at message layer AND specific data definitions and coding methods.

This standard applies to the message layer of the LTE-based wireless communication technology for vehicular internet.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB 2312-1980 Code of Chinese graphic character set for information interchange - Primary set

GB 5768.2-2009 Road traffic signs and markings - Part 2: Road traffic signs

GB 14886 Specifications for road traffic signal setting and installation

GB/T 27967-2011 Format of weather forecast on highway traffic

GB/T 29100-2012 Road traffic information service - Traffic event classification and coding

YD/T 3340-2018 Technical requirements of air interface of LTE-based vehicular communication

YD/T 3400-2018 General technical requirements of LTE-based vehicular communication

3 Terms, definitions, abbreviations

3.1 Terms and definitions

The following terms and definitions apply to this document.

3.1.1

Vehicle to everything, V2X

The communication, BETWEEN the on-board unit AND other devices, which includes, but is not limited to, the communication between the on-board units, the communication between the on-board unit and the roadside unit, the communication between the on-board unit and the pedestrian equipment, the communication between the on-board unit and the network.

3.2 Abbreviations

The following abbreviations apply to this document.

ASN.1: Abstract Syntax Notation One

BSM: Basic Safety Message

DE: Data Element

DF: Data Frame

DSM: Dedicated Short Message

DSMP: Dedicated Short Message Protocol

ID: IDentification

ITS: Intelligent Transportation Systems

LTE: Long Term Evolution

LTE-V2X: LTE Vehicle to Everything

RSI: Road Side Information

RSM: Road Side Message

RSU: Road Side Unit

[Definition]

Define the effective time attributes of road traffic events and road traffic sign information.

It is defined in UTC Universal Time, including the effective start time, end time, end time confidence, accurate to the minute.

[ASN.1 code]

```
RSITimeDetails ::= SEQUENCE {  
    startTime MinuteOfTheYear OPTIONAL,  
    endTime MinuteOfTheYear OPTIONAL,  
    -- Exact or estimated end time  
    endTimeConfidence TimeConfidence OPTIONAL  
}
```

5.2.3.53 DF_RTData**[Definition]**

Define road traffic incident information. Traffic incident classification supports GB/T 29100-2012. In this data frame, it contains the information source, occurrence area, timeliness, priority, impact area of the traffic incident. It may also use the form of text, to supplement the description or explanation of the event information.

When the on-board unit determines the area affected by a traffic incident, it can perform calculations in two ways, associative path and associative road segment, based on the information provided. The associated path, in the data frame, uses an ordered sequence of position points, to describe the center line of the affected area of the traffic event; meanwhile, it uses the radius to indicate the vertical distance from the center line of the affected area boundary, to reflect the width of the area to cover the actual road segment. The position points in the data frame are all offset coordinates, based on the external reference position coordinate points. Associated road segments are associated with the corresponding road segments and lanes, which are provided in the MAP message.

[ASN.1 code]

5.2.3.61 DF_TimeCountingDown

[Definition]

In the form of countdown, describe the complete timing state of a signal light phase state.

- **startTime**: If the current phase state has started (not ended), the value is 0; if the current phase state has not started, it means the time from the current moment to the next start of the phase state.
- **minEndTime**: Indicate the shortest time from the current moment to the end of the phase state (regardless of whether the phase state starts at the current moment).
- **maxEndTime**: Indicate the longest time from the current moment to the end of the phase state (regardless of whether the phase state starts at the current moment).
- **likelyEndTime**: Indicate the estimated time from the current moment to the end of the phase state next time (regardless of whether the phase state starts at the current moment or not). If the signal light's phase is a fixed period and a fixed duration, THEN, the value represents the exact time from the current moment to the next end of the phase state. If the current phase of the signal light is non-fixed timing (sensing timing, manual control, etc.), THEN, the value indicates the predicted end time. Meanwhile, the prediction time must be between minEndTime and maxEndTime, which may be predicted by historical data OR triggered by some events.
- **timeConfidence**: The confidence level of the predicted time of the above likelyEndTime.
- **nextStartTime**: If the current phase state has started (not ended), THEN, this value represents the estimated time between the current time and the next start of the phase state. If the current phase state has not started, it means the time from the current moment to the second start of this phase state. Usually, it is used in some related applications, such as ECO Drive.
- **nextDuration**: If the current phase state has started (not ended), the value indicates the duration of the phase state after the next start. If the current phase state has not started, it indicates the duration of the phase state after the second start. It is used in conjunction with nextStartTime; it is usually used in some related applications, such as ECO Drive.

Figure 7 shows the time values, when the phase state starts or does not start, at the current moment.

- A rough estimate of the time length of this phase state
- when it may next occur again.
- used to support various ECO driving power management needs.
- If already started, this value is recommended to be delivered.

}

5.2.3.62 DF_UTCTiming

[Definition]

Use UTC universal time format, to describe the complete timing state of a signal light phase state.

- startUTCTime: If the current phase state has started (not ended), THEN, the value is the time when the current state starts. If the current phase state has not started, THEN, it means the time when the current phase state starts next time.
- minEndUTCTime: Indicate the time corresponding to the next time the phase state ends, in the shortest time (regardless of whether the phase state starts at the current time or not).
- maxEndUTCTime: Indicate the time corresponding to the next time the phase state ends, in the longest time (regardless of whether the phase state starts at the current time or not).
- likelyEndUTCTime: Indicate the estimated end time next time of the phase state (regardless of whether the phase state starts at the current moment). If the phase of the signal light is a fixed period and a fixed duration, the value indicates the exact time, when the phase state will end next time. If the current phase of the signal light is non-fixed timing (sensing timing, manual control, etc.), THEN, the value indicates the predicated end time; meanwhile, the prediction time must be between minEndUTCTime and maxEndUTCTime, which may be predicted by historical data OR triggered by some events.
- timeConfidence: The confidence level of the predicted time of likelyEndUTCTime above.
- nextStartUTCTime: If the current phase state has started (not ended), THEN, this value indicates the estimated time when the phase state starts next time. If the current phase state has not started, THEN, it indicates the estimated time when the phase state starts the second time. It is usually used in some related applications, such as ECO Drive.
- nextEndUTCTime: If the current phase state has started (not ended),

one corresponding state is activated or restored from the activated state, the flag value shall be set and interacted.

When the vehicle receives a piece of data, which contains a special state of the vehicle, it needs to select a specific operation, based on the content of the data.

The special state of the vehicle is defined as follows:

- Hazard Lights: The vehicle warning lights are on.
- Stop Line Violation: Before reaching the intersection, the vehicle predicts that it may not have time to brake and cross the stop line.
- ABS: The ABS system was triggered and exceeded 100 milliseconds.
- Traction Control: The electronic system's control traction is triggered for more than 100 milliseconds.
- Stability Control: The vehicle body stability control is triggered for more than 100 milliseconds.
- Hazardous Material: Hazardous goods transport vehicles.
- Hard Braking: Vehicle brakes abruptly, AND the deceleration is greater than 0.4G.
- Lights Changed: In the past 2 seconds, the status of the lights has changed.
- Wipers Changed: In the past 2 seconds, the status of the vehicle's wipers (front window or rear window) has changed.
- Flat tire. The vehicle found that at least one tire had a puncture.
- Disabled Vehicle: The vehicle is malfunctioning AND cannot be driven.
- Air Bag Deployment: At least one airbag has popped out.

[ASN.1 code]

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----