Submitted by the expert from China

Informal document **GRVA-08-04**
8th GRVA, 14-16 December 2020
Agenda item 9(a)

中汽中心 | NTCAS 全国汽车标准化技术委员会 National Technical Committee of Auto Standardization

Overview of China ICV standards development and proposals for UN/WP.29/GRVA

Sun Hang, CATARC
December, 2020

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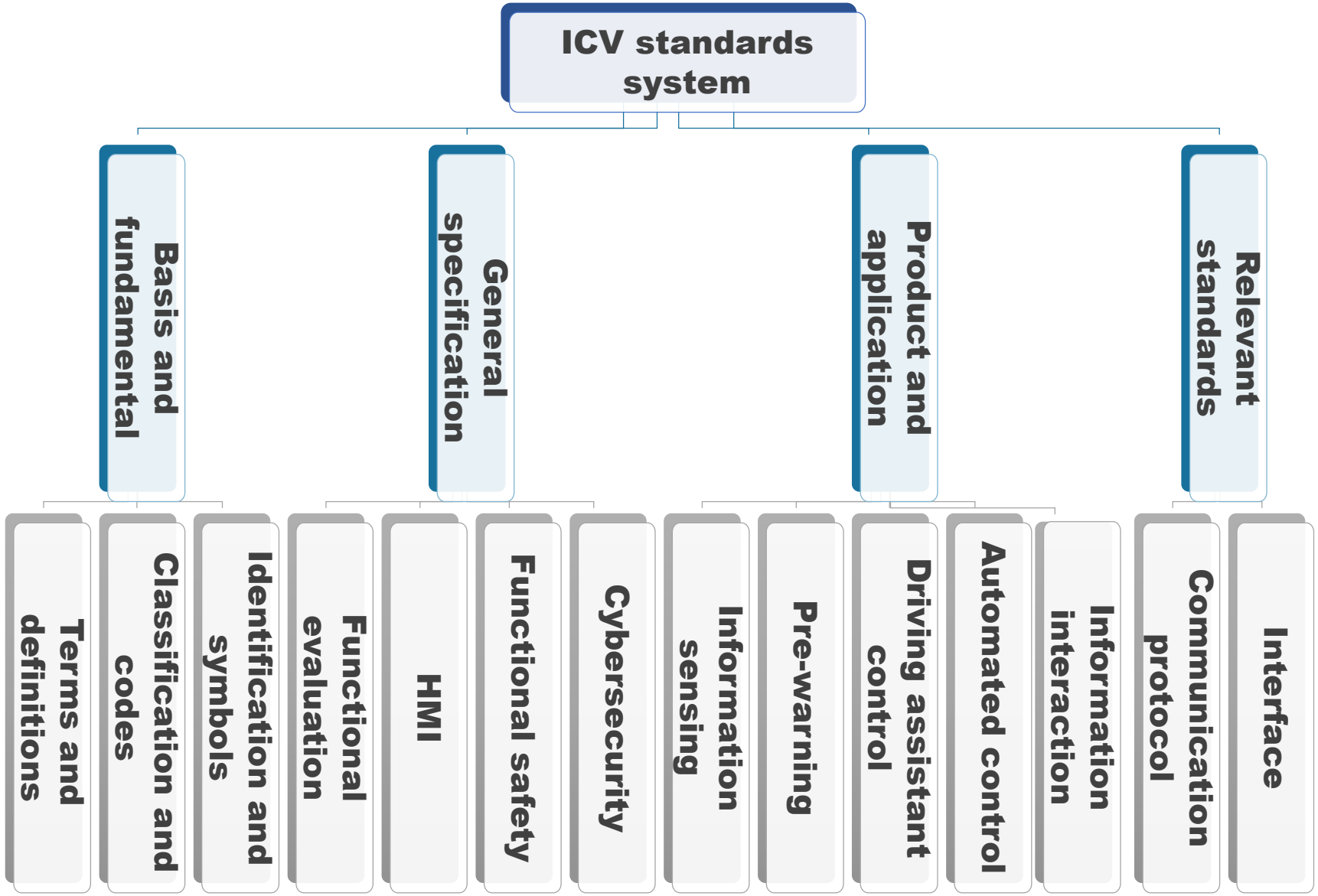
1. ICV Standard System Framework



Standard projects

53 standards have been launched in total
standard publication-5, final text for approval-5, new project registered-13

Pre-research projects

23 Standard Research Project
Research released- 18
In process-5

2. Organizational structure of SC34 on ICV

Organizational structure

SAC/TC 114

↓

SC 34 on ICV

subcommittee on Intelligent and Connected Vehicles

Established in December 2017

↓

- ADAS
- Automated Driving
- Communication function
- Cyber security
- Resource management and Information service

FEAG

HEAG

Scope:
vehicle driving environment perception and pre-warning, driving assistance, automated driving and vehicle information service etc

Members:
OEMs, Parts supplier, Testing organization etc from Europe, America, Japan, China and other countries.

Foreign Experts Advisory Group
established in June 2018
composed by authoritative technical experts, scholars or officials from the United Nations, ISO, SAE, Europe, America, Japan etc.
Provide consulting for Chinese ICV standardization

Harmonization Experts Advisory Group
established in August 2018
composed by OEMs, testing institutions and Internet companies etc, all of them from China.
harmonization of international standards and regulations of China ICV in the fild of WP.29/ISO/IEC.

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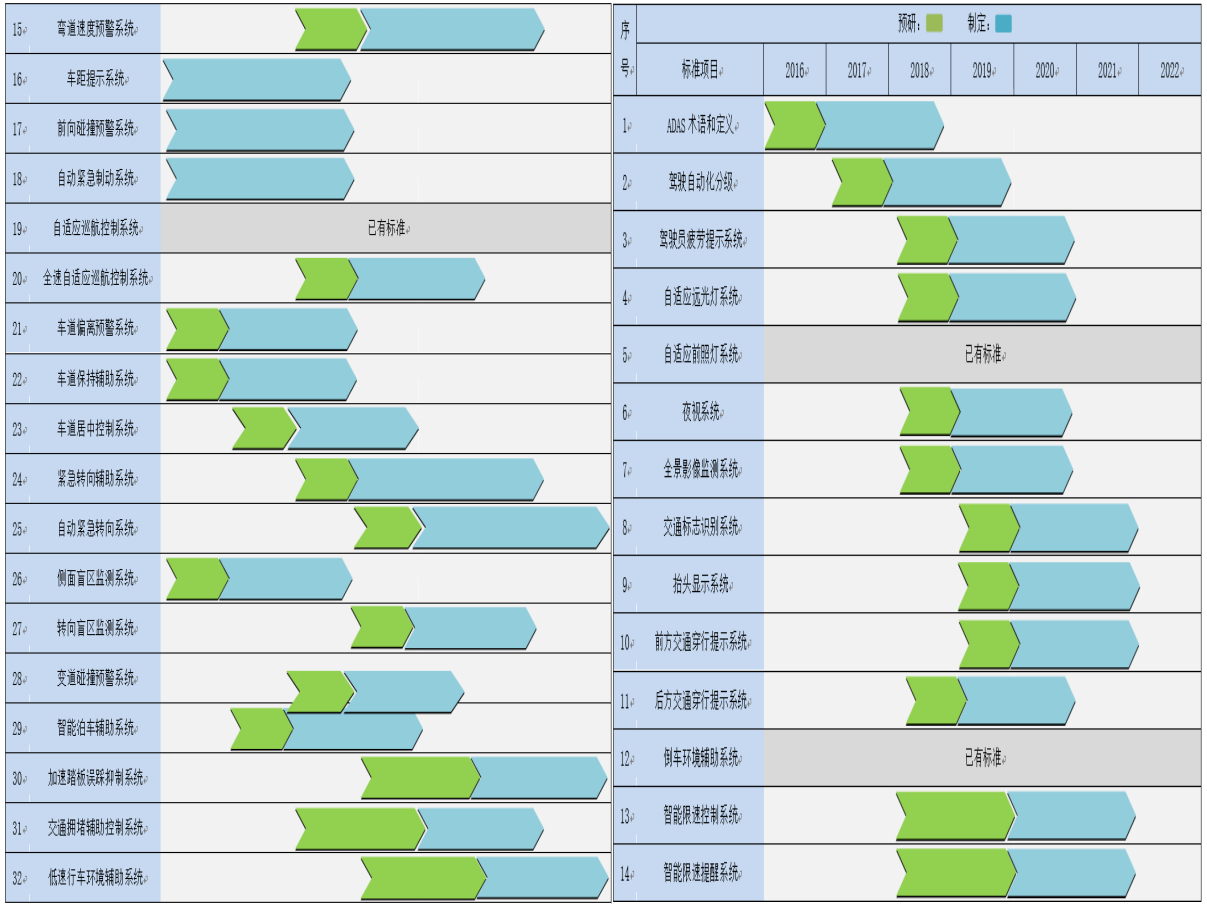
1. Advanced Driver Assistance System

Based on ADAS standardization roadmap, 23 standard projects have been launched, among them, publication-5, new project registered-7

ADAS Roadmap



AEBS of commercial car

LKA of passenger car

ESC commercial vehicle

BSD

ADAS Terms and Definitions

AEBS of passenger car

LKA of commercial vehicles

Intelligent speed limit

PA

symbols

DMS

AVM

Night vision

DOW

RCTA

combined driver assistance system : 2 parts

full speed range ACC

Test device for ADAS and AD: 4 parts

- publication
- final text for approval
- new project registered
- project proposed for registration
- drafting stage

2. An example for ADAS standards—DMS

Functional requirements

System monitoring behavior definition and warn conditions

behavior	definition
eyes closed	Complete closure of eyelids
yawn	The aspect ratio of mouth opening is greater than 0.6
Abnormal head posture	Head twist angle ≥ 45 ° left and right, ≥ 30 ° up and down
Receiving and Making Calls	The distance between the phone and the face is within 5cm
smoking	Hold the cigarette within 2cm to the mouth

test method

Dummy driver + Human driver

- The single test shall be repeated 10 times
- Validate the influence on the system from respective light angles and conditions(forward, backward, lateral, night)
- The simulation driver validates the real-time performance and detection rate of the system through repeated actions
- Multiple drivers are responsible for validating the detection ability of random drivers

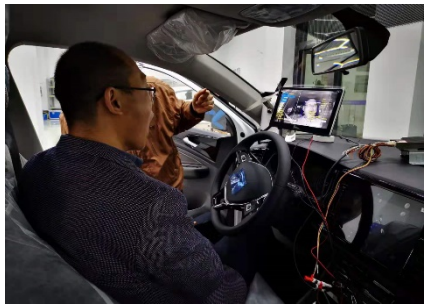
Performance requirements

Accuracy rate

The ratio of the correct number of a behavior to the number of detected events

Detection rate

The ratio of the correct number to the number of real events of a behavior



3. Automated Driving

13 standard projects have been launched, among them, final text for approval-1, standard projects approved-2

AD standards

- **General specification**
  - OEDR
  - HMI
  - MRM
- **Test Method**
  - Simulation
  - Proving ground
  - Real road
- **Key systems**
  - DSSAD
- **basic**
  - Terms and definitions
  - Taxonomy of AD level

Principle: follow the same logic for urban roads and highways, but carry out standardization work independently

- Taxonomy of AD level
- Proving ground test
- terms and definitions of ICV
- Evaluation Guidelines for AD Functions
- DSSAD
- Real road test
- General functional requirements for AD
- Operational design condition
- AD applications in constrained areas
- Auto-parking
- Vehicle positioning system

final text for approval | new project registered | project proposed for registration | idrafting stage

4. Communication Function & Application

5 standard projects have been launched, among them, 2 automobile industry standards, new project registered-2

CFA standard subSystems

Basic	Terms and definitions; Classification and Coding
General specification	Vehicular communication system; Functional evaluation
Specific application	DAY I: Driving safety related DAY II: Fusion with perceptual information DAY III: For collaborative automated driving

- Extended vehicle (ExVe) methodology
- LTE-V2X PC5
- On board short range wireless communication
- Vehicular cable

new project registered | project proposed for registration | drafting stage

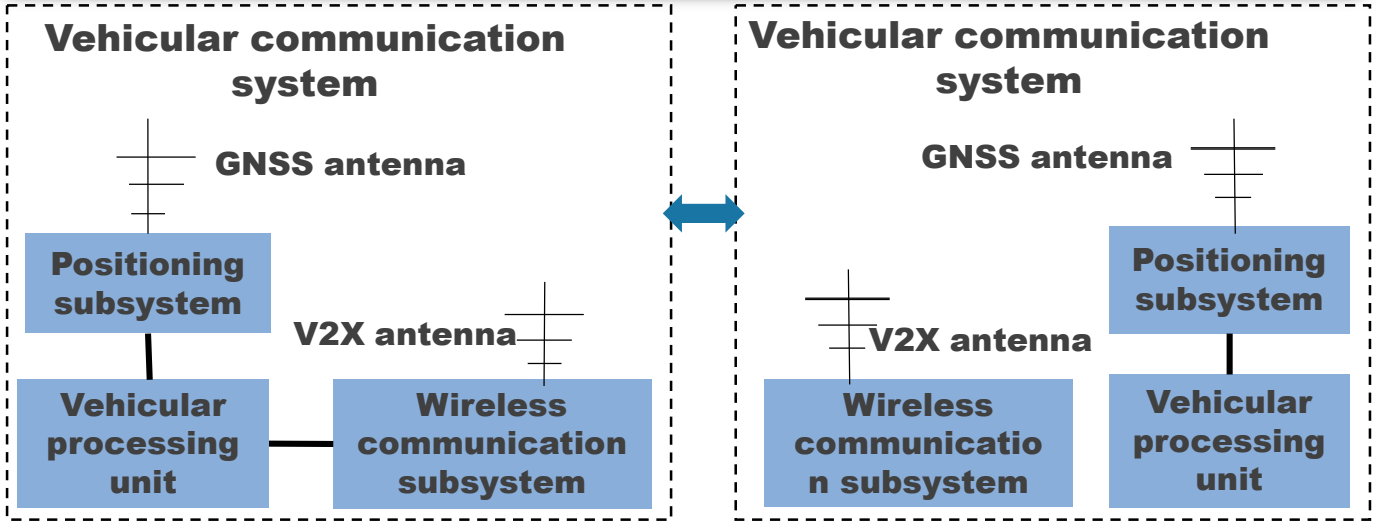
5. An example for CFA standardization—LTE-V2X PC5

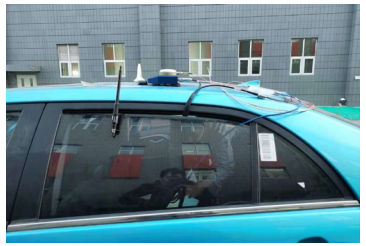
Technical Requirements of Vehicular Communication System based on LTE-V2X Direct Communication

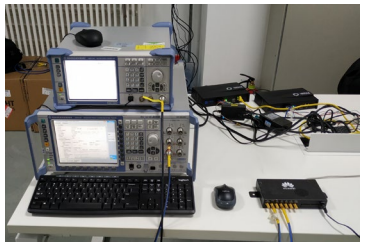
Composition of Project Group

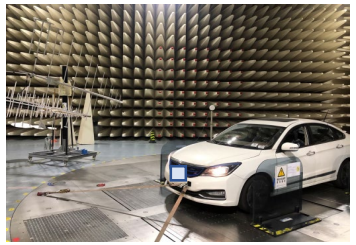
CATARC、Qualcomm、BMW、DAIMLER、volkswagen、TOYOTA、FORD and Some Chinese Enterprises

System Overview









General requirements

- Electrical performance
- Weatherability
- Enclosure protection
- Mechanical properties
- Durability
- EMC

System function

- Access layer
- network layer
- application layer
- Security layer

Communication performance

- RF performance
- Antenna performance

Timing and positioning

- Positioning requirement
- Timing

Test methods

- system test
- Vehicle test

6. CS & RMIS

Cybersecurity

Basic general
- Terms and definitions
- Concept and process
- General specification

Generic Technology
- risk assessment
- security protection
- Test evaluation

Key systems and components
- External interface
- Vehicle internal communication

Function application and management

Relevant standards
- Network Communications
- Platform facilitis

13 standard projects have been launched, final text for approval-4,new project registered-2

Resource Management and Information Service

Hardware	High performance AD information processing unit
Software	Vehicle operating system
Platform	Vehicle and remote computing and service platform
Data	Vehicle data resource management and Application
Application	Standardization Requirement analysis and coordination of ICV

3 standard projects have been launched, project proposed for registration-2

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1. Proposal for next steps of GRVA

1. Good coordination between VMAD and FRAV needs to be established

To ensure the requirements both from overall and specific perspective are aligned, deliverables from both IWGs should have defined interface for exchange, and both IWGs need create more opportunities to work together in order to figure out how to match each other.

2. Framework for the regulation on ADS needs to be established first

A pre-designed framework for the final regulation(s) would serve as guideline for individual IWGs to work efficiently. It is recommended that the highway and urban can share the same overall framework and specific requirements for each could be varied.

3. Consideration of ADAS

ADAS has great potential in promoting road traffic. Besides ADS, ADAS should not be neglected.
If needed, China volunteered to daft a preliminary list of ADAS working items for the consideration of GRVA.

CATARC

中汽中心

NTCAS

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