Recent LTE-V2X Standardization Activities in China

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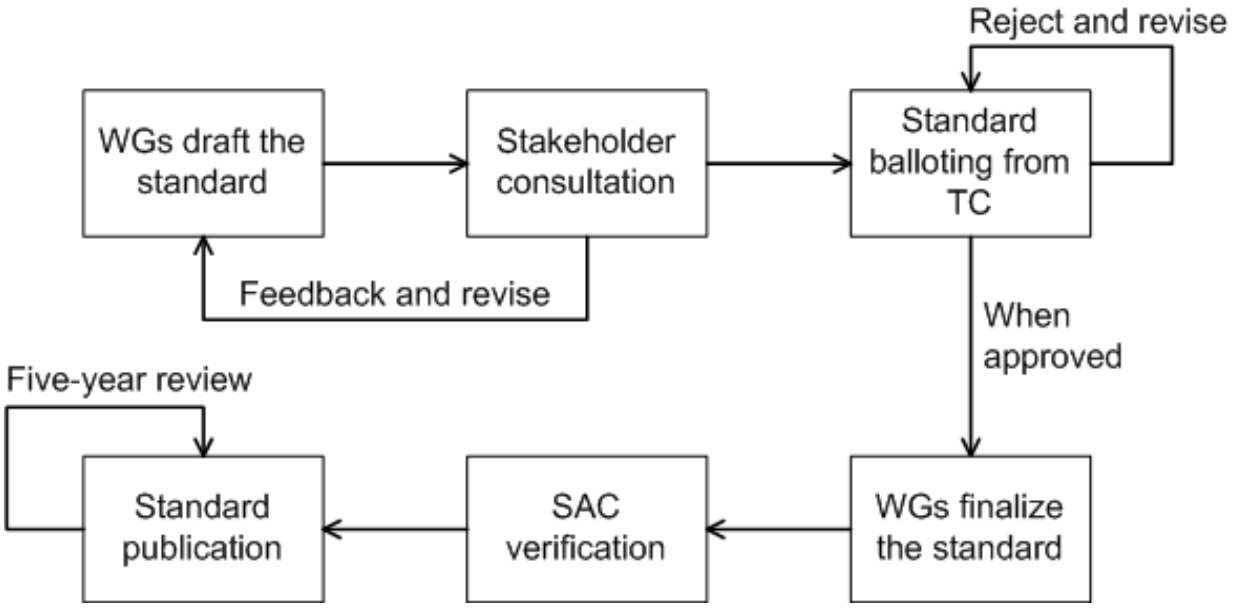
Overview

- China ITS Standard Systems
- Major ITS Standardization Bodies and Industries in China
  - CCSA (China Communications Standards Association)
  - C-ITS (China ITS Industry Alliance)
  - TIAA (Telematics Industry Application Alliance)
- LTE-V2X Standardization Activities

China ITS Standard Systems (1/2)

- Used to be ministry-driven and industry-supporting. Now industries play increasingly important roles in standard development.
- Four types of standards: National Standards (GB), Sector Standards (JB/DL/…), Provincial Standards (DB) and Enterprise Standards (QB).



National Standard Development Process

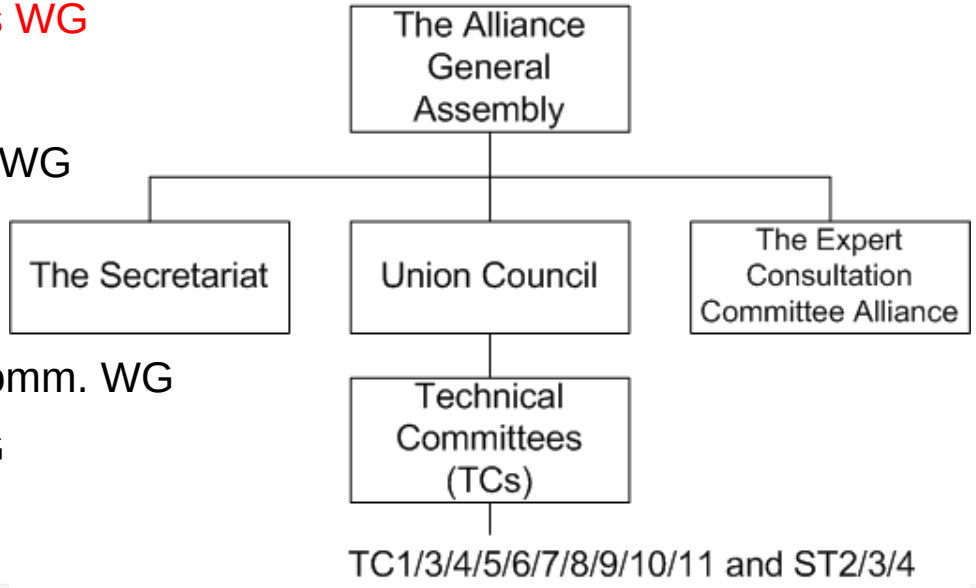
China ITS Standard Systems (2/2)

- Ministry of Industry and Information Technology (MIIT)
  - CCSA (China Communications Standards Association)
  - TIAA (Telematics Industry Application Alliance)
- Ministry of Transport (MOT)
  - RIOH (Research Institute of Highway) (mirror of ISO/TC 204)
  - C-ITS (China ITS Industry Alliance)
- China Standardization Administration (SAC)

CCSA

中国通信标准化协会
China Communications Standards Association

- Formed in 2002, CCSA is a non-profit professional group with the responsibility for developing communications technology standards, with major players covering communication enterprises, manufacturing companies, research institutes and universities. CCSA has 180 members by 2015/03.
- In CCSA, TC5 (Wireless communications) is very active in ITS-related aspects:
  - WG3: WLAN and Wireless Access WG
  - WG4: cdmaOne&cdma2000 WG
  - WG5: 3G Security and encryption WG
  - WG6: B3G WG
  - WG8: Frequency Workgroup
  - WG10: Satcom and Microwave Comm. WG
  - Special WG: AH2-IOT Special WG



C-ITS

中国智能交通产业联盟
China ITS Industry Alliance

- Established in 2013/09 initiated by 46 founding members, expanded to 145 members by 2015/03.
- New development mode, breaking down barriers across industries and disciplines, including IT manufactures, telecommunications and vehicle manufactures

TIAA

- Established in 2010, TIAA's mission is to promote telematics services and technology innovation and service applications of connected vehicle networks.
- TIAA's business scope include vehicle manufacturing, automotive electronics, automotive software, communication operation, and service integration.
- TIAA focus more in IT technology in automotive.

LTE-V2X Activities in CCSA (1/4)

- 2012/01 ~ 2012/12, CCSA TC5WG3 finished a research project titled “Study of wireless access technologies for intelligent transportation systems”.
- The project researched candidate technologies (GSM, UMTS, LTE, WiMAX, DSRC, cdma2000, McWill) for various applications, including vehicle safety, traffic efficiency, and information services.
- The pros and cons of the above-mentioned technologies are summarized.

Highlights:

- LTE has advantages in coverage and capacity, perfect for non-safety applications.
- DSRC can support safety application when the network load is low.

Main Contributors:

- Huawei, CATR, BUPT, Samsung, CATT, China Unicom, China Mobile, ZTE, Qualcomm, etc.

Timeline:

- Jan. 2012 ~ Dec. 2012

LTE-V2X Activities in CCSA (2/4)

- 2013/08 ~ 2014/12, CCSA TC5WG3 finished a research project titled “The study of vehicle safety short-range communication technology in TD-LTE”.
- The project researched the short-range wireless communication technology solutions for vehicle activate safety applications based on TD-LTE.
- Focused on active safety applications with 14 typical crash warning use cases.

Highlights:

- 14 V2V/V2I crash warning use cases
- Communication requirements
- Candidate technologies based on TD-LTE and performance evaluations

Main Contributors:

- CATT, Huawei, CATR (China Academy of Telecommunication Research), SRTC (The State Radio Monitoring Center), ZTE

Timeline:

- Aug. 2013 ~ Dec. 2014

LTE-V2X Activities in CCSA (3/4)

- In 2015/01, CCSA TC5WG3 approved a standard project titled “General technical requirements of Communication Based on LTE for Vehicle Application”. This is a joint standard project with C-ITS.
- The project aims to further study the communication requirements for active safety applications and candidate system architectures, taking into account unique traffic characteristics in China.

Highlights:

- Active safety applications
- Communication requirements and candidate system architectures
- Unique use cases / requirements of China

Main Contributors:

- CATR (China Academy of Telecommunication Research), Huawei, CATT

Timeline:

- Jan. 2015 ~ Dec. 2015 (expected)

LTE-V2X Activities in CCSA (4/4)

- In 2015/03, CCSA TC5WG8 approved a research project named “Frequency requirement and coexistence study on intelligent transportation system V2V/V2I active safety application”.
- The project aims to study candidate dedicated spectrum for ITS active safety application in China.
- CCSA TC5WG3 project “The study of vehicle safety short-range communication technology in TD-LTE” potentially used as inputs.

Highlights:

- V2V/V2I Active safety applications
- Dedicated spectrum allocation
- Spectrum requirement study
- Candidate spectrum study

Main Contributors:

- CMCC, Huawei, CATT, CATR (China Academy of Telecommunication Research), SRTC (The State Radio Monitoring Center)

Timeline:

- Mar. 2015 ~ Dec. 2016 (expected)

Recent LTE-V2X Activities in C-ITS

No	Name	Time
1	General technical requirements of Communication Based on LTE for Vehicle Application (Joint standard project with CCSA)	2014-2015
2	General technical requirements for information security in cooperative ITS systems	2014-2015
3	V2X system performance testing standards	2014-2015
4	ETC-DSRC-Key equipment for extended applications: General technical requirements / RSE / OBU / Initialization Device / Testing	2013-2014
5	Cooperative ITS DSRC Part1~4	2013-2014
6	Vehicles remote service system General technical requirements	2013-2014

C-ITS Testing Facilities

- Collaboration with automotive, communication and ITS industries to form cross-disciplinary testing platforms.
- Three major testing labs:
  - China TTL Lab 中國泰爾實驗室
  - ITS Transportation Sector Key Lab
  - TÜV-China Automotive Component Testing (ACT) Lab TÜVRheinland® Genau. Richtig. + EDAG

    ---- The first third-party lab set up in China that meets Chinese and German whole vehicle testing standards.
- Recent completed tests:
  - ETC-DSRC testing
  - Vehicle forward collision buffer system: Operation performance and detection requirements
  - Full-speed adaptive cruise control system: Operation performance and testing standards

LTE-V2X Activities in 3GPP

- In 2014/11, LTE-V2X study was initiated in SA1#68.
- In 2014/12, there was an intensive discussion on the feasibility of LTE-direct technology in the domain of V2X in RAN#66. An LS was sent from RAN to SA1, requesting SA1 to prioritize the study of V2X requirements.
- In 2015/02, A study item was approved in SA1#69 named “Study on LTE support for V2X services”, which is expected to complete by 2015/12.
- The objective is to study LTE support of V2X services taking into account V2X services and parameters defined in other SDOs (e.g., ETSI TC ITS, USDoT) or related governmental agencies. The scope covers V2V/V2I/V2P.
- In 2015/03, LSs were sent to the relevant SDOs for V2X services use cases and requirements.

Thank you

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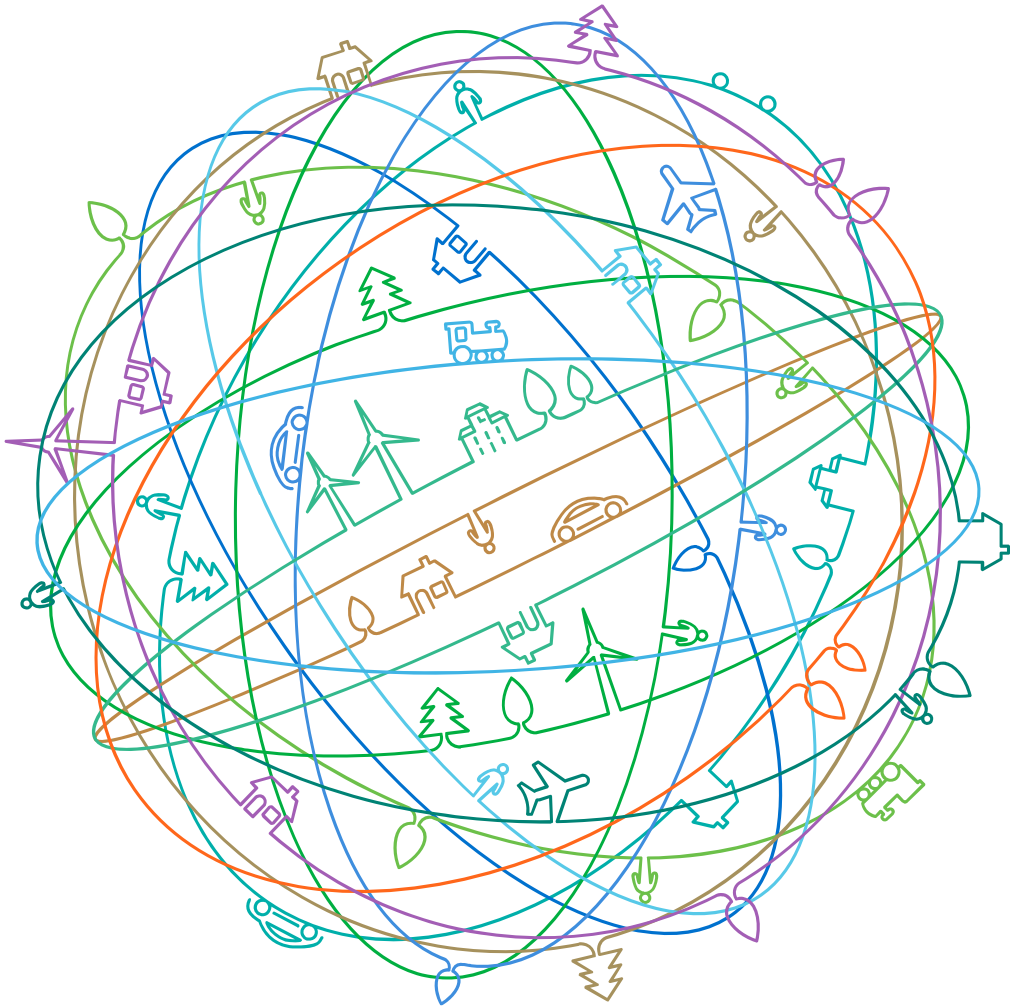

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