Session 5 : Global Standards on ITS radio communications - Japan -

ISO/TC204/WG15 Committee of Japan

Kikuo Tachikawa

(Oki Electric Industry Co., Ltd.)

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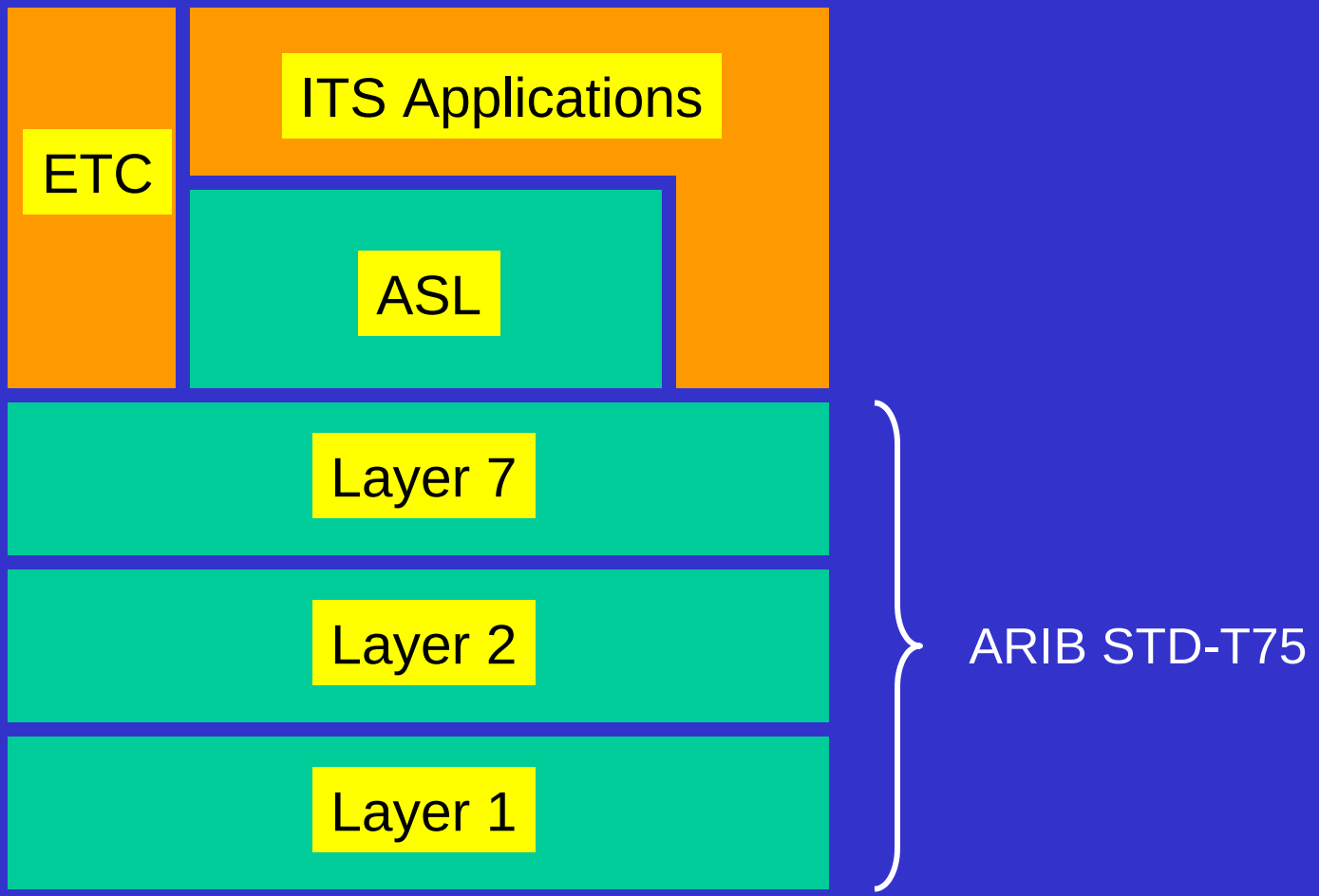
1. Progress of Japan's DSRC standardization

- 1994 : Start of deliberation of DSRC for ETC
  at Telecommunication Technology Council
- 1997/09 : Regulations issued by MPT
  (Decision on 5.8GHz active system)
- 1997/11 : Standard established as ARIB STD -T55
- 2000/02 : Start of deliberation of DSRC system
  at Telecommunication Technology Council
- 2000/10 : Report from the Council
- 2001/04 : New DSRC regulations issued by MPHPT
- 2001/09 : Standard established as ARIB STD -T75
- 2002-2003 : Deliberation of ASL

2. Japan's DSRC architecture



3. Outline of Japan's DSRC
(1) Japan's DSRC radio system

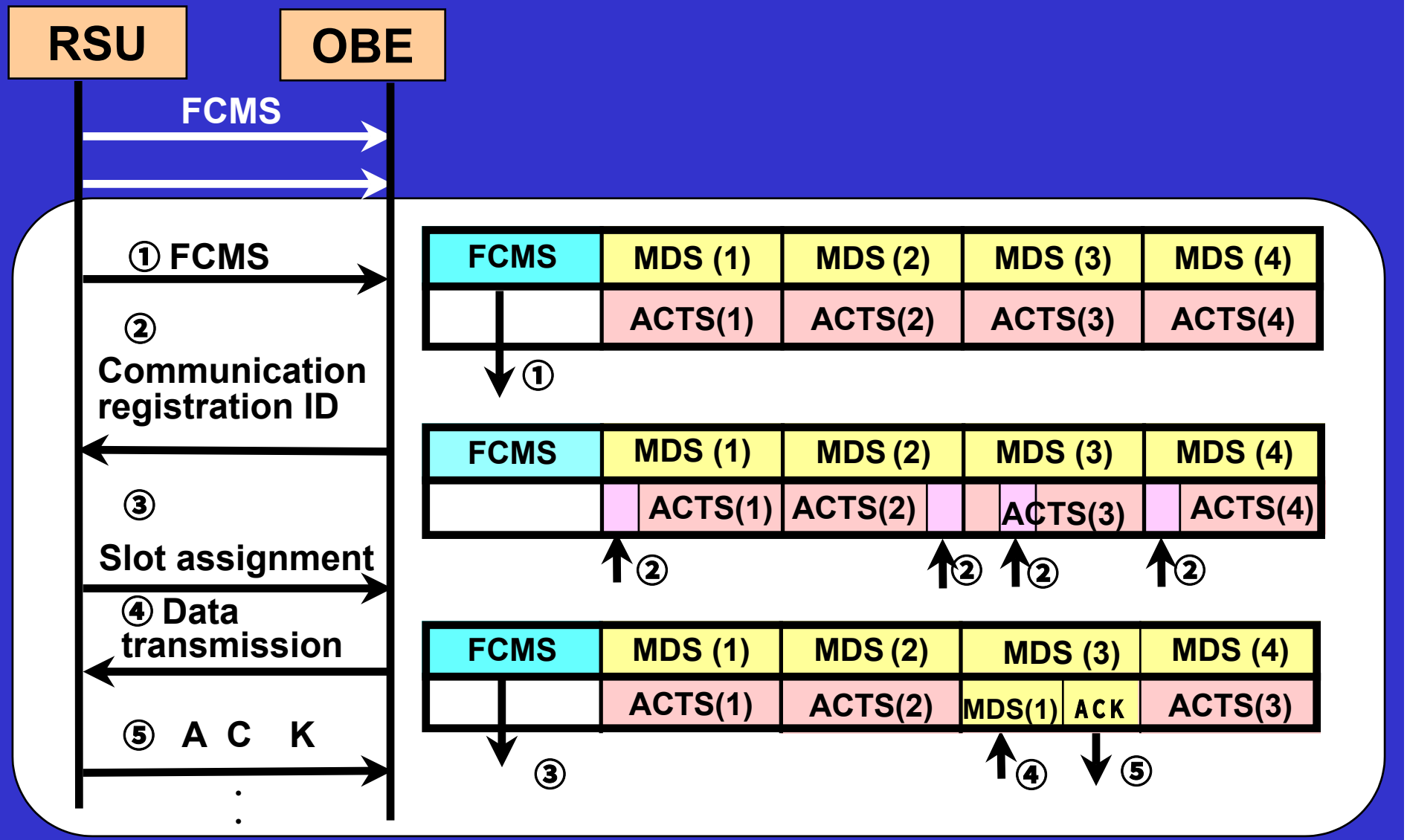
Item	ARIB STD-T55		ARIB STD-T75	
	Base station	Mobile station	Base station	Mobil station
- Frequency band	5.8 GHz band		5.8 GHz band	
- Channel separation	10 MHz		5 MHz	
- Channels - Down link	2		7	
- Up link	2		7	
- Modulation	ASK		ASK, QPSK	
- Data rate	1 Mbps		1 Mbps/ASK, 4 Mbps/QPSK	
- Communication	TDMA/FDD		TDMA/FDD	
- Power supplied to antenna	≤300mW	≤10mW	≤300mW	≤10mW
- License	Necessary	Not necessary (*)	Necessary	Not necessary (*)

- Base station : RSU, Mobile station : OBE
(*) : Certification is necessary

(2) Japan's DSRC/Layer 2 [1]

- Applicable both to lane-based and free-flow communication zones with the following features:
  - Reliable communication with re-transmission scheme
  - Full-duplex operation of RSUs to increase channel capacity
  - Synchronous protocol with TDMA scheme to reduce interferences

(2) Japan's DSRC/Layer 2 [2]



(3) Japan's DSRC/Layer 7

- **Almost the same as CEN's L7**
  - Harmonizing as one standard

- **Minor change requirements**
  - Modification of initial connection
  - Addition of Fragment Length (FL)
  - Addition of new AID =14, etc.
  - Others

4. R&D of DSRC

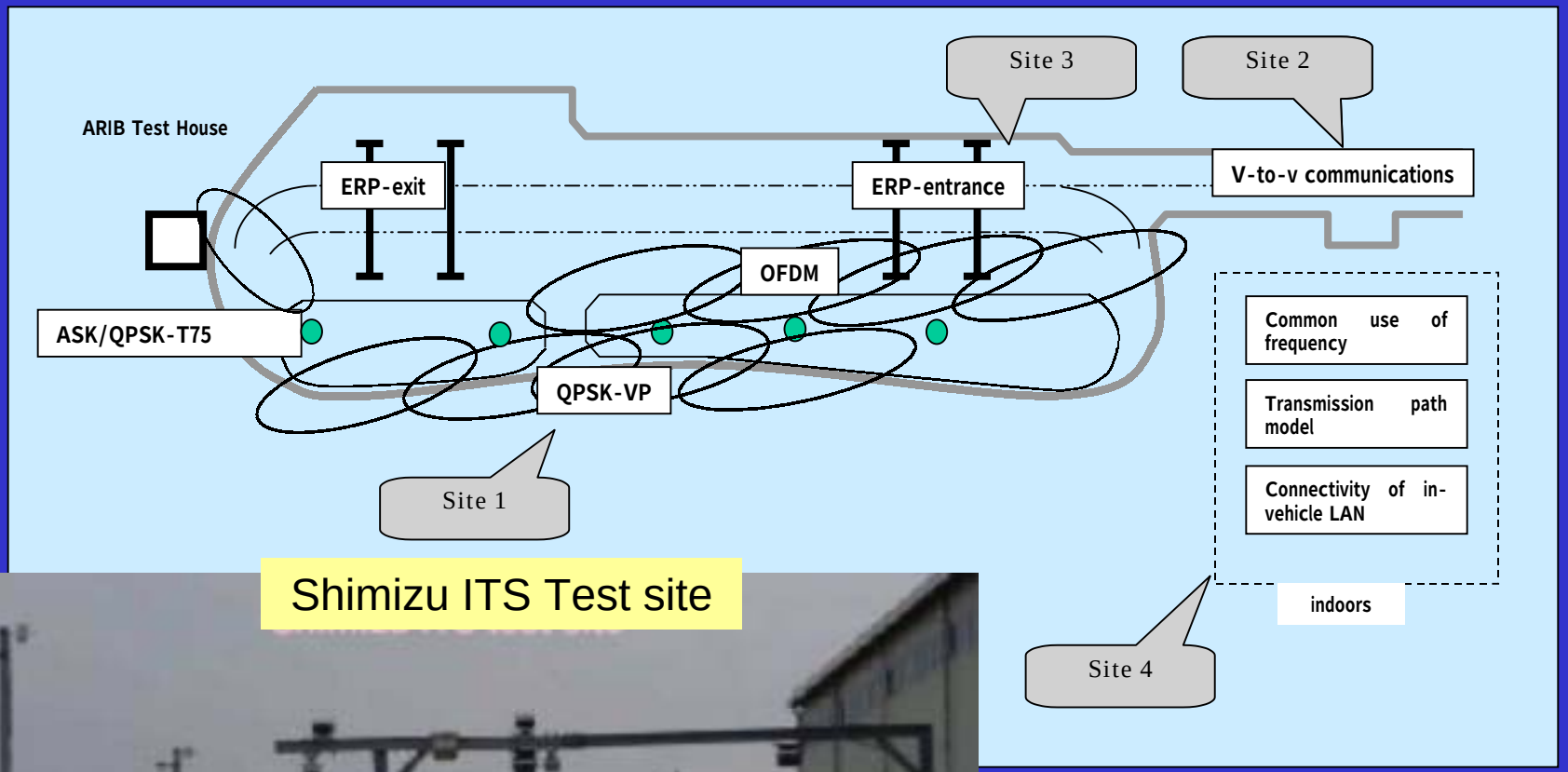
(1) Projects on DSRC-related R&D or experiment [1]

Project	Organization	Year	Aim / Outline
Advanced and general purpose of wireless IC card on vehicles	TAO (5 manufacturers including NTT communications)	1999	R&D for DSRC standards development and experiment of parking lot management system
Popularization of OBE's for ITS by DSRC generalization	NEDO/JSK (15 manufacturers)	1999 -2000	R&D for application of DSRC and large-scale experiment of ETC
Internet ITS	Toyota, Denso, NEC, etc.	2001 -2002	R&D and business study about Internet platform in vehicle
EFP service	ITS Research Institute	2002	Experiment about realization of DSRC application system

(1) Projects on DSRC-related R&D or experiment [2]

Project	Organization	Year	Aim / Outline
Smart gateway	TAO (6 manufacturers including KDDI)	2000 -2002	R&D about advanced technology of DSRC toward AHS realization
Smart communications	NILIM/HIDO (14 manufacturers)	2001 -2003	Experiment about effectiveness of smart communications platform at SA, PA, etc.
Commonly using technology at 5.8GHz band	ARIB (5-10 manufacturers)	2000 -2002	R&D about DSRC-related radio system using 5.8GHz band
Info-communications model system for Regional ITS	ARIB (4 local self-governing bodies)	2002 -2003	Experiment for inter-connectivity between RSU and OBE by some manufacturers

(2) Commonly using technology at 5.8GHz band



Shimizu ITS Test site

5. Japanese application of DSRC

1) Parking lot management-type DSRC system
2) Filling station-type DSRC system
3) Convenience store-type DSRC system
4) Drive-through-type DSRC system
5) Logistics management-type DSRC system
6) Pedestrian support-type DSRC system
7) Specific region entry charging-type DSRC system
8) Information supply-type DSRC system used in semi-stationary state
9) Information supply-type DSRC system used while traveling at high speeds