Third-Generation (3G) Mobile Broadband

US Standards Bodies & US Industry - -Their Roles in Making 3G Happen
August 10, 1999, Dan Bart, TIA

Telecommunications Industry Association (TIA)

❖ A Full Service Trade Association representing 1,000 member companies that provide communications and information technology products, materials, systems, distribution services and professional services in the United States and around the world

Telecommunications Industry Association (TIA)

❖ Services to members include:

- Trade Shows

- Domestic Public Policy

- Foreign Affairs, Policy, Trade Missions, Reverse Trade Missions, Trade Promotion

- Marketing Statistics

❖ An ANSI-accredited Standards Development Organization (SDO)

Telecommunications Industry Association (TIA)

- TIA Standards and Technology Department comprised of five product Divisions
- Wireless Communications Division
- Satellite Communications Division
- Fiber Optics Division
- User Premises Equipment Division
- Network Equipment Division
- www.tiaonline.org

TIA Engineering Committees

- **TR-8**
  Mobile and Personal Private Radio Standards

- **TR-14**
  Point-to-Point Communications Systems

- **TR-29**
  Facsimile Systems and Equipment

- **TR-30**
  Data Transmission Systems and Equipment

- **TR-32**
  Personal Radio Equipment

- **TR-34**
  Satellite Equipment and Systems

- **TR-41**
  User Premises Telephone Equipment Requirements

- **TR-42**
  Telecom. Cabling Infrastructure

- **TR-45**
  Mobile and Personal Communications Systems

- **TR-46**
  Mobile and Personal Communications

- **FO-2**
  Optical Communications Systems

- **FO-6**
  Fiber Optics

Standards Participation

- Approx. 1,500 individuals listed in TIA database
- Approx. 250 member companies of TIA are represented
- Approx. 150 companies which are not members of TIA are represented

- Participation is open to any party having a direct and material interest, Int'l liaisons
- At present, voting limited to organizations that have a permanent place of business in the U.S., Mexico, or Canada

Telecom Standards Developers in the US who are major US contributors to ITU

- In the United States, there are <u>two</u> major accredited standards developers for telecommunications
  - TIA
  - Committee T1
- Both are accredited by the American National Standards Institute (ANSI)

Telecommunications Standards More Global than Ever

- ❖ NAFTA
- ❖ CITEL
- ❖ APEC
- ❖ ETSI
- ❖ GSC
- ❖ RAST
- ❖ ITU/IMT-2000
- ❖ 3GPPs

Players in the international standards arena

❖ ITU is the "Pre-eminent" global standards developer for telecommunications
  – Most countries/regions of the world do not contribute to standards development in ITU

❖ International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) and Joint Technical Committee 1 (JTC1), Information Technology, are other sources of international standards. Recently, IETF.

Global Standards Collaboration (GSC)

❖ GSC5 will be hosted by TIA/T1 in Williamsburg, VA in 8/99. Invitees include:

ACIF, TSACC, TTA, TIA/T1, TTC/ARIB, ETSI, ITU-T, ITU-D, ITU-R, IISP, ATMF, IETF, JTC-1, China, Mexico, India, CITEL

❖ 3G/IMT-2000 topics on the agenda

RAdio STandardization (RAST)

◆ Basically same SDOs (countries) as GSC

◆ Similar purpose to GSC, except radio

◆ Meets about every 9 months

◆ RAST7 meeting just held in January, 1999, next meeting, RAST8, will be co-located with GSC5 in Williamsburg, VA in 1999

Global Market for Mobile Communications

- According to ITU, expected to grow from approximately 200 million users in 1998 to nearly 2.4 billion by 2015

- Current Market Saturation Less Than 10%

- 3G Systems Intended to Provide "Anytime, Anywhere" Services

IMT-2000

- International Mobile Telecommunications-2000
- The ITU vision of global wireless access in the 21st century, including mobile and fixed access, IMT-2000 is aimed at providing direction to the many related technological developments in this area to assist the convergence of these essentially competing wireless access technologies.
- A/k/a Third Generation or "3G"

IMT-2000

International Mobile Telecommunications 2000 (IMT-2000) Initiative with User Benefits to Include:

◆ Advanced Multi-Media Services

◆ Data Rates up to 2 Mbps

◆ Next-Generation Mobile Internet and Advanced Packet Services

◆ Global Roaming

IMT-2000 June 1998 Proposals

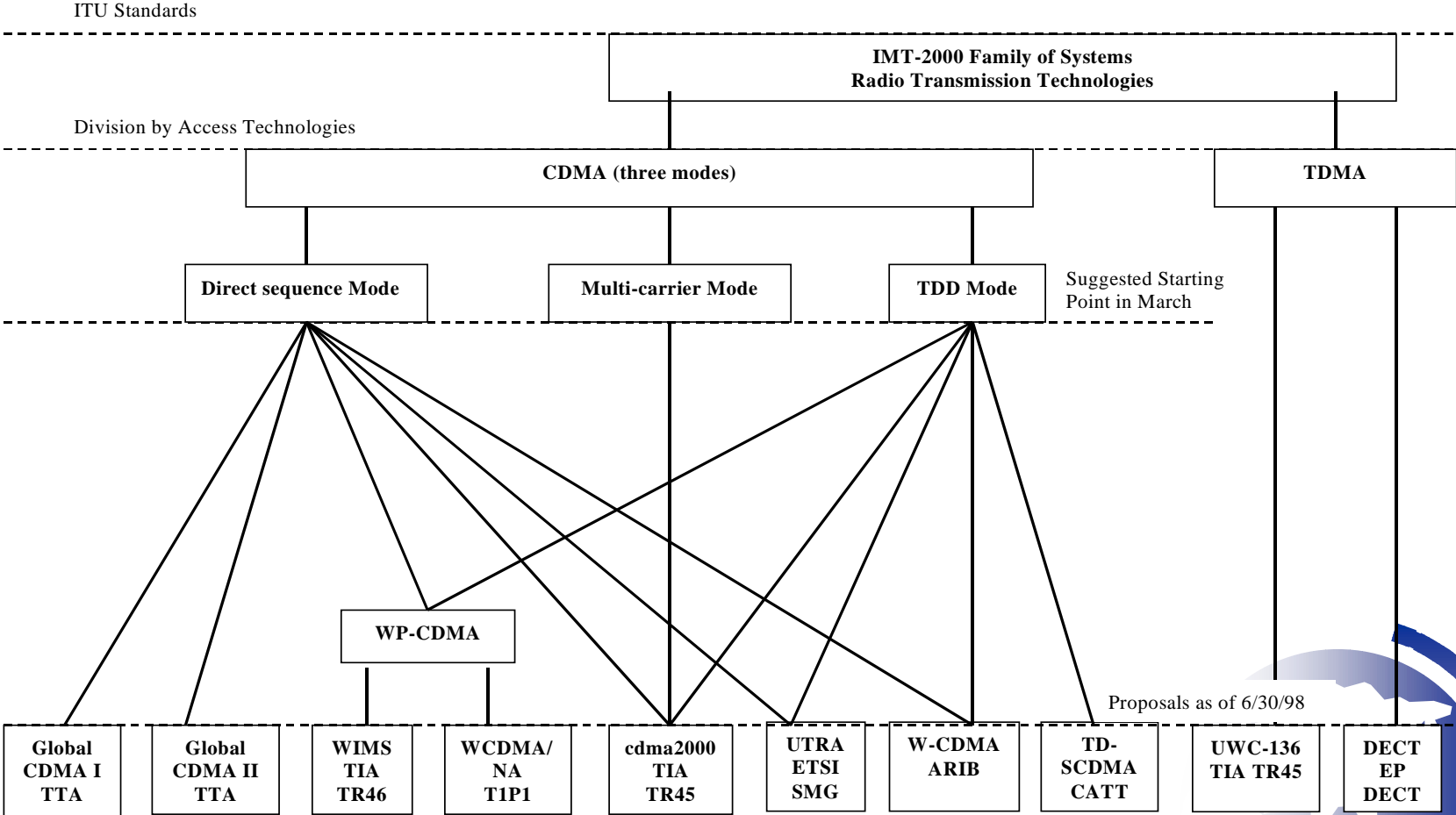| Proposal	Type	Description	Source
UWC-136	**Terrestrial**	**Universal Wireless Communications**	**USA TIA TR-45.3**
WIMS W-CDMA	**Terrestrial**	**Wireless Multimedia and Messaging Services Wideband CDMA**	**USA TIA TR-46.1**
NA: W-CDMA	Terrestrial	North American - Wideband CDMA	USA T1P1-ATIS
cdma2000	**Terrestrial**	**Wideband CDMA (IS-95)**	**USA TIA TR-45.5**
SAT-CDMA	Satellite	49 LEO Satellites in 7 planes at 2000 km	South Korea TTA
DECT	Terrestrial	Digital Enhanced Cordless Telecommunications	ETSI Project (EP DECT)
TD-SCDMA	Terrestrial	Time-Division Synchronous CDMA	China Academy Telecommunications Technology

IMT-2000 June 1998 Proposals

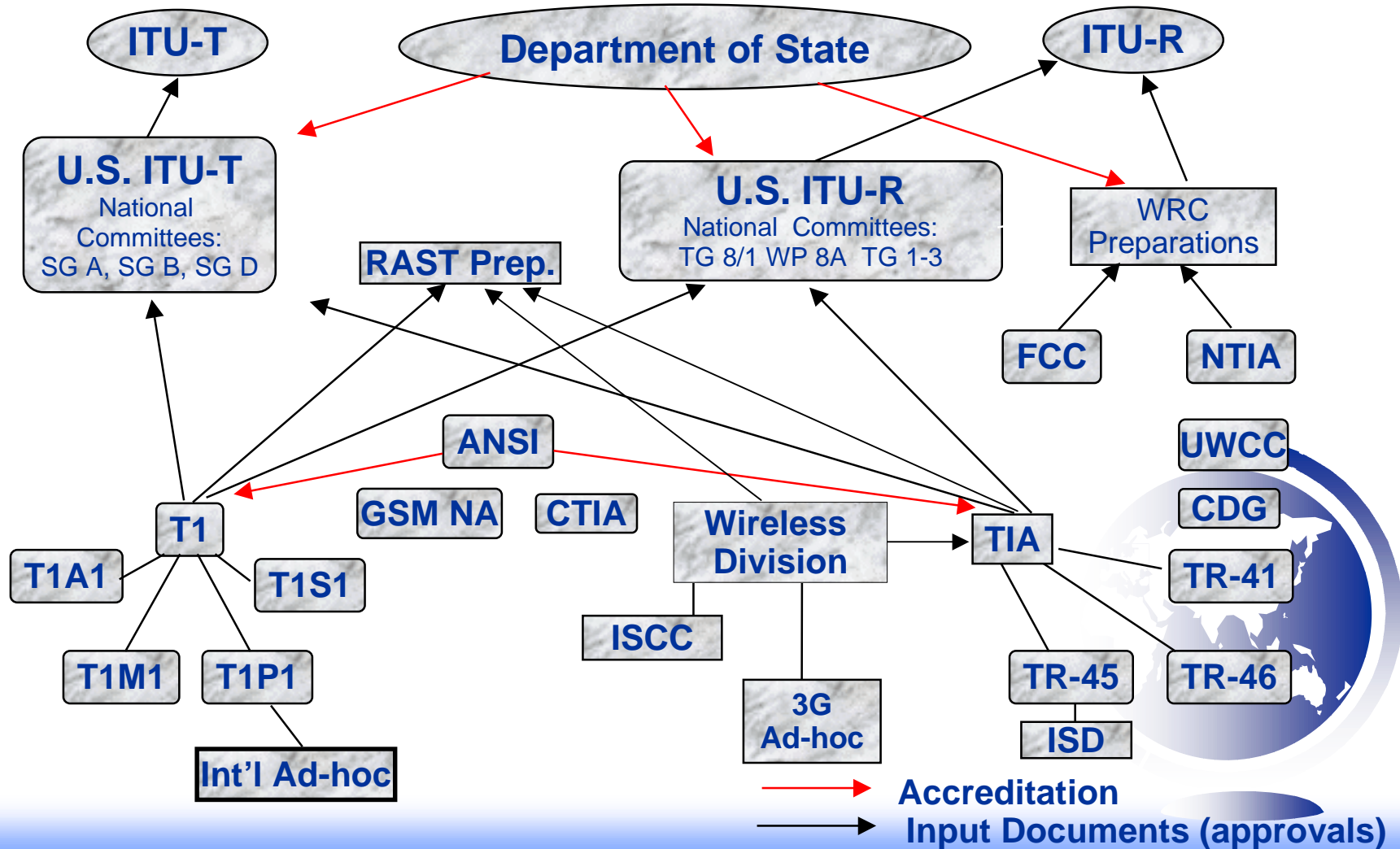| Proposal	Type	Description	Source
SW-CDMA	Satellite	Satellite Wideband CDMA	European Space Agency
SW-CTDMA	Satellite	Satellite Wideband Hybrid CDMA/TDMA	European Space Agency
ICO RTT	Satellite	10 MEO Satellites in 2 planes at 10,390 km	ICO Global Communications
W-CDMA	Terrestrial	Wideband CDMA	Japan ARIB
CDMA II	Terrestrial	Asynchronous DS-CDMA	South Korea TTA
CDMA I	Terrestrial	Multiband Synchronous DS-CDMA	South Korea TTA
UTRA	Terrestrial	UMTS Terrestrial Radio Acess	ETSI SMG2
Horizons	Satellite	Horizons Satellite System	Inmarsat

Figure 1. Access Technology Categories

ITU Standards

IMT-2000 Family of Systems
Radio Transmission Technologies

Division by Access Technologies

CDMA (three modes)

TDMA

Direct sequence Mode

Multi-carrier Mode

TDD Mode

Suggested Starting
Point in March

WP-CDMA

Proposals as of 6/30/98

| Global CDMA I TTA | Global CDMA II TTA | WIMS TIA TR46 | WCDMA/ NA T1P1 | cdma2000 TIA TR45 | UTRA ETSI SMG | W-CDMA ARIB | TD-SCDMA CATT | UWC-136 TIA TR45 | DECT EP DECT |

U.S. Standards Process Terrestrial Wireless (2G, 3G) Standards

ITU-T

Department of State

ITU-R

U.S. ITU-T
National Committees:
SG A, SG B, SG D

RAST Prep.

U.S. ITU-R
National Committees:
TG 8/1 WP 8A TG 1-3

WRC
Preparations

FCC

NTIA

ANSI

UWCC

CDG

GSM NA

CTIA

Wireless Division

TIA

TR-41

T1

T1A1

T1S1

ISCC

TR-45

TR-46

T1M1

T1P1

3G Ad-hoc

ISD

Int'l Ad-hoc

→ **Accreditation**

→ **Input Documents (approvals)**

TIA WCD 3G ad hoc achieved its mission

✦ Given complexities of USA system, at request of TIA Board, WCD established 3G ad hoc to work:
- harmonization,
- communication to government on 3G, and
- spectrum

✦ 3 Task Groups established

✦ By March 1999 WCD meeting, work finished and ad hoc proposed to be disbanded.

European Telecommunications Standards Institute (ETSI)

- Born in 1988 - less than 10 staff
- 10th Anniversary 1998, 100 staff, $30M
- An ESO like CEN, CENELEC
- Big push to make ETSI standards, Global Standards
- In 1998, proposed new "Partnership Project" approach for 3G

Third-Generation Partnership Projects (3GPPs)

- ETSI proposed 3GPP in March 98 to TIA/T1
- Accelerate Specifications for 3G
- ETSI focus GSM/UTRA
- Launched in Dec 98
- 5 SDOs
- Then 800K Euro support, now 7 ME

- ANSI International Committee reviewed
- Urged ANSI SDOs to participate
- TR-45 decision in Sept 98, ANSI-41 and related RTTs
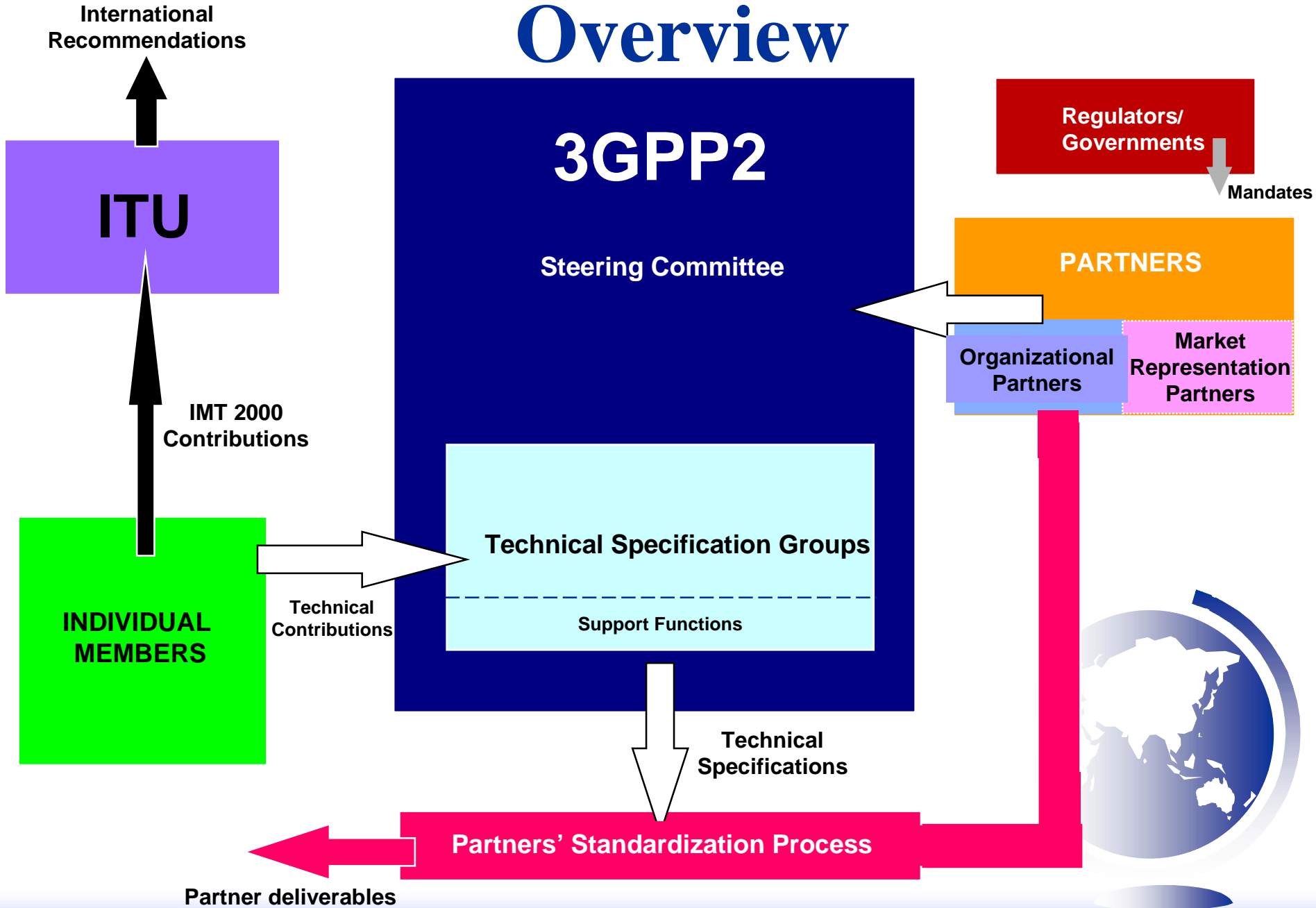- Meetings 9/98, 10/98, 12/98 with SDOs
- 3GPP2 launched 1/99 4 SDOs

Definition of the Third-Generation Partnership Project

The 3GPP2 will provide globally applicable technical specifications for 3rd generation mobile systems based on evolved IMT 2000 technologies, to be transposed by relevant standardization bodies (Organizational Partners) into appropriate deliverables (*e.g.*, standards). WWW.3GPP2.ORG

Overview

International Recommendations

ITU

3GPP2

Steering Committee

Regulators/ Governments

Mandates

PARTNERS

Organizational Partners

Market Representation Partners

IMT 2000 Contributions

Technical Specification Groups

Support Functions

INDIVIDUAL MEMBERS

Technical Contributions

Technical Specifications

Partners' Standardization Process

Partner deliverables

Participants in 3GPP2

- USA (TIA – Telecommunications Industry Association)

- Korea (TTA – Telecommunications Technology Association)

- Japan (TTC – Telecommunication Technology Committee)

- Japan (ARIB -Association of Radio Industries and Businesses)

- China (CWTS - China Wireless Telecommunication Standard group)

- Observers also, ETSI, TSACC, Australia

Operators' Harmonization Group (OHG)

- Series of meetings to define what Operators need from 3G
- Status reports to ITU, 3GPPs, SDOs
- Manufacturers invited to last meetings
- May 1999 Recommendations for 3- Mode CDMA

- OHG Recommendations accepted by US TABD in June 1999
- OHG accepted in Beijing by TG 8/1 June 1999
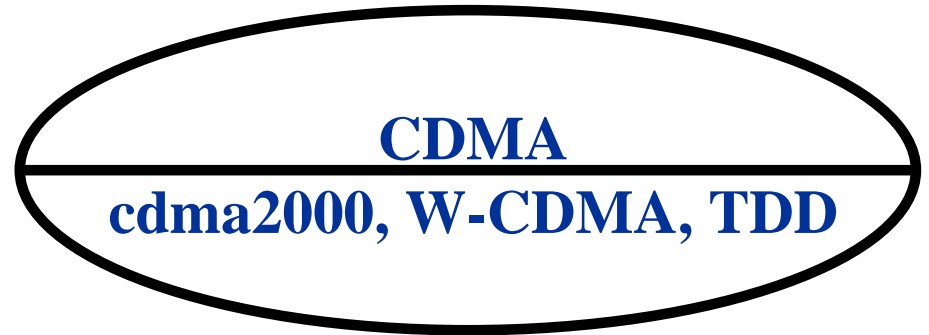- 3GPP in Nice in July
- 3GPP2 in Montreal in July

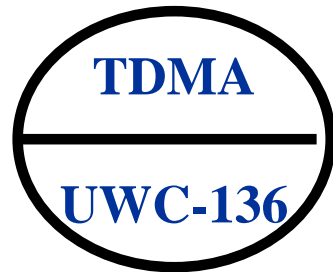# Workshops Planned for August and September

- Direct Sequence (DS) on evolved ANSI-41
- Multicarrier (MC) on evolved GSM/MAP
- Network interworking requirement of OHG recommendations
- www.3gpp.org and www.3gpp2.org for more information

3G Family of Standards

RF Interface

TDMA

UWC-136

CDMA
cdma2000, W-CDMA, TDD

Core Network

ANSI-41

GSM MAP

Internet and IETF involvement in International Standards

- ITU-T has adopted referencing Recommendation for IETF documents
- TIA and T1 working with IETF
- ETSI TIPHON working with IETF
- TIA and T1 working with TIPHON
- ITU-T SG 13 lead on Internet/Telephony

CONCLUSIONS

- For the Telecom Sector, Global Standards are what the market is demanding, especially 3G

- The world's telecom SDOs including T1, ETSI, and TIA are cooperating more than ever to meet the market demand

- ITU is pre-eminent, but the ITU process needs acceleration

- All key SDOs and industry players need to be part of the process

Questions??

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