



ITU-T

ITU-D Regional Development Forum for the Arab Region "NGN and Broadband, Opportunities and Challenges

Accessibility considerations in ITU recommendations concerning NGN and future networks

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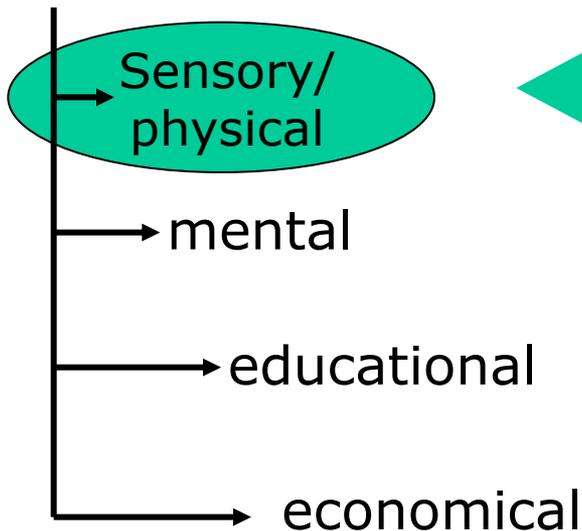
Contents

- Definitions & scope
- NGN architecture
- Accessibility guidelines & checklist
- Accessibility considerations in NGN
- Service Mobility Management (total Conversation)
- Everything done?
- Summary

Definitions & Scope

Accessibility

- **Art. 9 UN Convention on the rights of persons with disabilities**
Note: It's not a set of guidelines but the law in all countries that have ratified it
- **Accessibility (ISO16011): Usability of a product, service, environment or facility by people with the widest range of capabilities (General)**
- **=>Accessibility in the given context narrowed to disabled people**
- **Disabilities**



Consideration in NGN standardization (ITU-T JCA-AHF)

- ✓ **Accessible design:** Accessibility has to be built in into products and services from the very beginning
- ✓ **Availability:** Accessible products and services must be on hand to users
- ✓ **Affordability:** Access to products and services must be reasonable

Definitions & Scope

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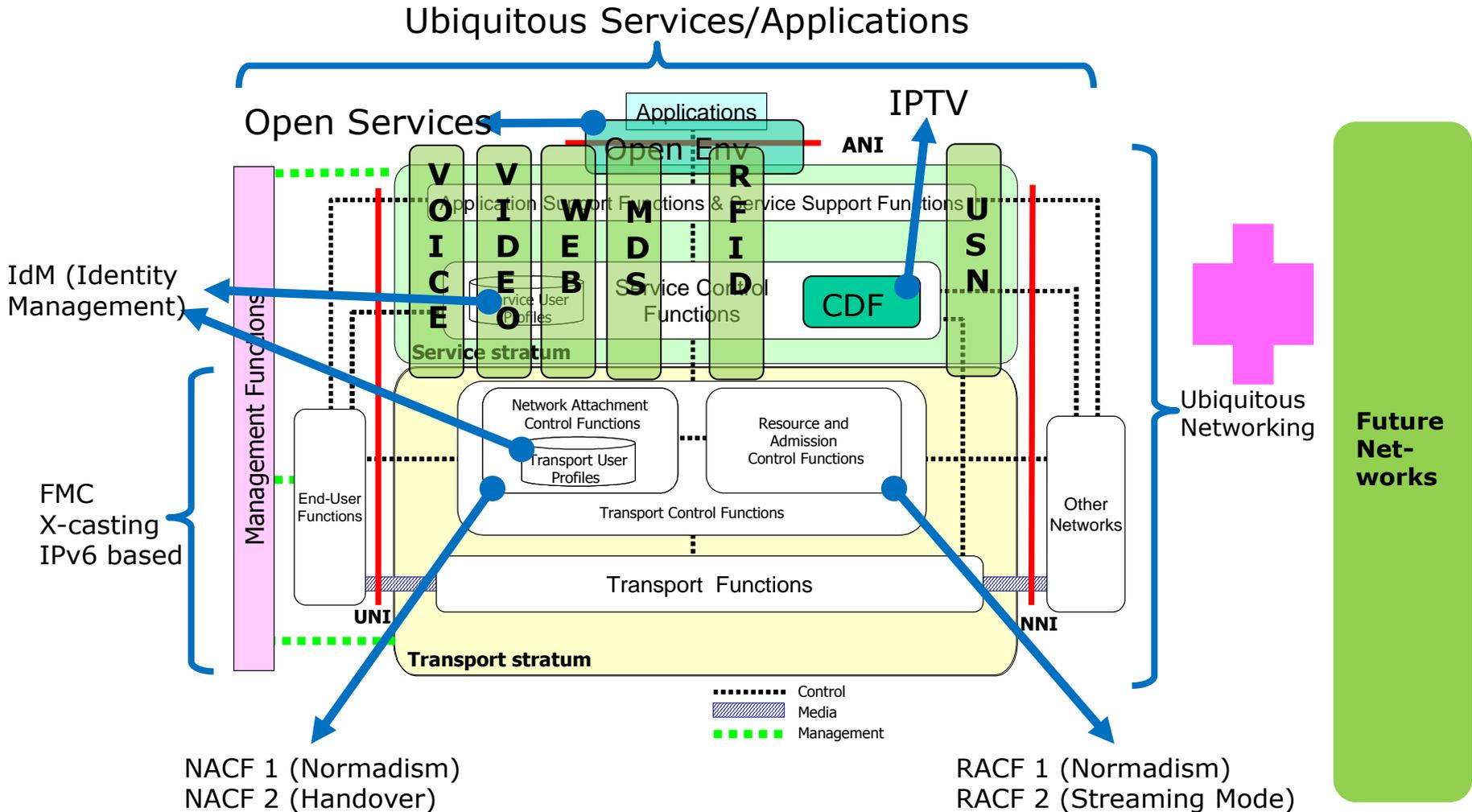
Rec.

Y.2001

Next Generation Network (NGN):
a **packet-based** network able to provide telecommunication services and able to make use of **multiple broadband, QoS-enabled** transport technologies and in which **service-related functions** are **independent** from underlying **transport-related technologies.**

It enables unfettered access for users to networks and to competing service providers and/or services of their choice. It supports **generalized mobility** which will allow consistent and ubiquitous provision of services to users.

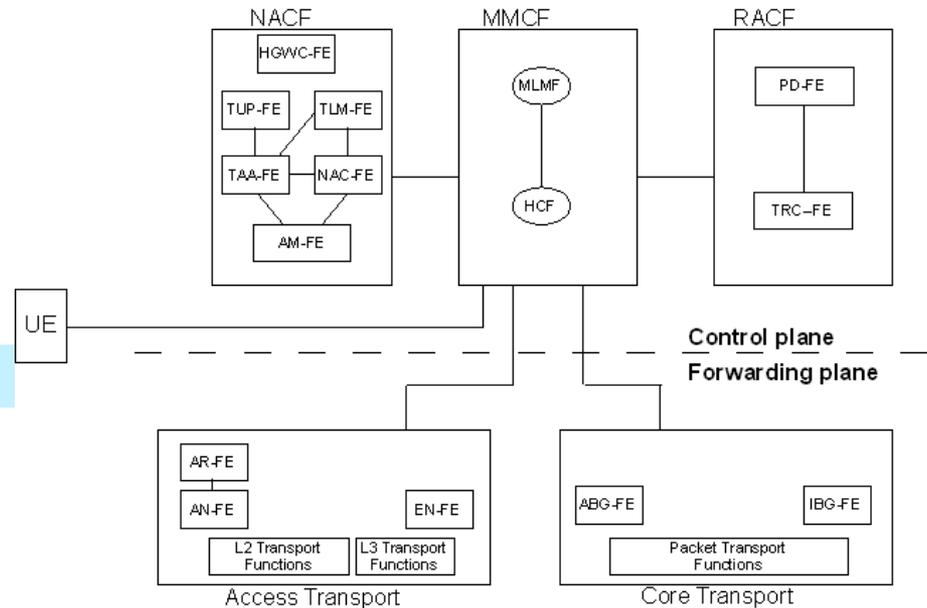
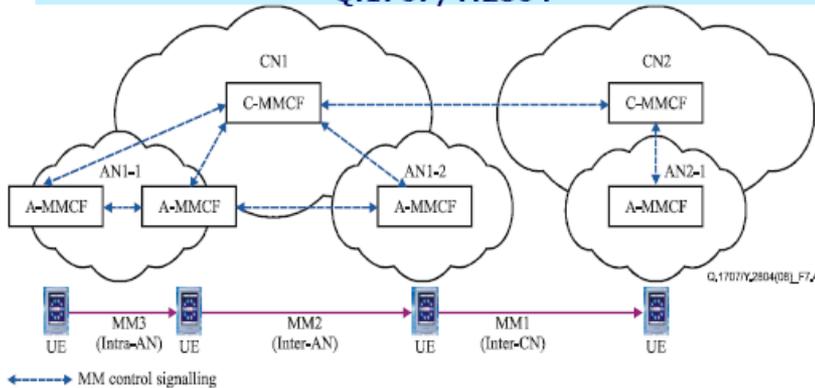
NGN Architecture



NGN Architecture

Mobility Management (including FMC-scenarios)

Example of MMCF network configuration – Q.1707/Y.2804



Y.2018: Mobility management and control framework and architecture within the NGN transport stratum

Initial step of detailed functional mapping within the NGN architecture framework is currently progressing in Y.MMCF

- Architecture and functional requirements for management of logical location information and control of mobility in NGN transport stratum

Accessibility guidelines & checklist

- **Pylons of accessibility requirements:**
- ITU-T Rec F.790 “Telecommunications accessibility guidelines for older persons and persons with disabilities”:
 - General guidelines for standardizing, planning, developing, designing and distributing all forms of telecommunications equipment, software and services
 - Guidance on understanding the topic of accessibility and the ways that accessibility may be incorporated in products and services.
- “Telecommunications Accessibility Checklist”
 - To ensure that accessibility needs are taken into account from the beginning (structured set of reminders)
 - “Design for all” = “Inclusive design”
 - Aligned with the new UN Convention on the rights of persons with disabilities
 - Aimed at standards writers but can be used in other situations

Accessibility guidelines & checklist

- **Accessibility Checklist contains**
- Basics of accessibility:
 - a: serve widest range of capabilities in main stream feature
 - b: settable characteristics for further adaptation
 - c: adaptable through standardised interfaces
- Use of the checklist
- Control of devices, control of services
- Media transport, Media entry by user
- Media presentation to user
- Invocation of media translating functions
- User and device profile management and usage
- Records from the use of the checklist

Accessibility achievements in NGN/ IPTV recommendations



Number	Title
Y.1901	Requirements for the support of IPTV services
Y.1991	Terms and definitions for IPTV
Y.2007	NGN capability set 2
Y.2201	Requirements and capabilities for ITU-T NGN
Y.2802/ Q.1762	Fixed-mobile convergence general requirements
Y.2808	Fixed mobile convergence with a common IMS session control domain
Y.2281	Framework of Networked Vehicle in NGN
Y.Sup.1	ITU-T Y.2000 series - Supplement on NGN release 1 scope
Y.Sup.2	ITU-T Y.2000 series - Supplement on NGN release 2 scope
Y.Sup.5	Supplement on IPTV service use cases
Y.Sup.7	Supplement on NGN release 2 scope
Y.Sup.8	Global ICT fora/consortia survey
Q.1741.x x=4,5,6	IMT-2000 references to Release y of GSM evolved UMTS core network (y=6,7,8)

Accessibility achievements in NGN/IPTV recommendations (cont.)

■ **Requirements on IPTV (NGN application)**

■ **Accessibility feature** [Y.1901, Y.1991]: An additional content component that is intended to assist people hindered in their ability to perceive an aspect of the main content. Examples: captions for the hard of hearing, subtitles in various languages, sign-language interpretation video and descriptive audio

■ **Universal design** [Y.1901]: It is the design of the products and environments to be useable by all people, to the greatest extent possible by including accessibility features in the original design to prevent the need for adaptation after deployment (= > example EPG)

■ Mentioning **captions** as primarily to assist users having difficulty hearing the sound

■ Support for end users with disabilities [Y.Sup.5]: End-users with and without disabilities can benefit from supplementary content alongside and in synchronization with the main content. The most common services are subtitling, which provides language translation of the dialogue, and captioning, which provides a transcript of sound effects as well as the dialogue to aid people who cannot hear the sound. Another form of supplementary content is visual sign language translation for deaf people

Accessibility achievements in NGN recommendations (cont.)

Requirements on NGN/ FMC

- NGN is required to provide the means needed for **invocation of relay services**. Relay services translate between various modes of telecommunication that are of interest for people with disabilities (e.g., sign language, lip reading, text, voice). Invocation of relay services may be based on user preferences, address resolution or user commands [Y.2201].
- NGN is required to have the capability to invoke **relay services** by either party in an **emergency telecommunication** [Y.2201].
- Support **emergency telecommunication** with alternative and multiple media ... for people with disabilities [Y.2201] [Y.Sup.7] explicitly for NGN.
- NGN release 1 services support **total conversation** (see also [b-ITU-T F.703]), voice **telephony with text** (see also [b-ITU-T T.140]), assistance services for disabled persons. Total conversation is classified as **basic service** for NGN [Y.Sup.1] [Y.Sup.7].
- Use cases described in [Y.Sup.1] include **customer service desk supporting deaf clients** through a video relay service or a real-time text relay service, for translation between sign language and voice or between real-time text and voice (business use cases) and **communication with older people in home care**, who may need to see the person they are talking to and need text or lip-reading to compensate for hearing reduced by age (medical use cases)
- User requirements of good flow of the video image for use in sign language and lip reading should be considered so that when conditions call for quality sacrifice, firstly spatial resolution is reduced and then, as a last resort, the temporal resolution [Y.Sup.1].
- **Accessibility requirements for networked vehicle services and features** [Y.2281]: Accessibility is required to ensure that the specified services and features are also usable by as many as possible people with disabilities.
- FMC is required to provide all the means to support public interest services required by regulations or laws of relevant national or regional administrations and international treaties. This includes **requirements for users with disabilities** [Y.2802/Q.1762, Y.2808]

Example: fix/mobile total Conversation

Fixed / mobile converged scenarios (e.g. UC) become an important issue for accessibility in NGN and future networks.

Example: Service mobility support for total conversation in NGN and future networks (different network access types with different capabilities regarding supplied bandwidth, delay, packet loss etc.)

[Y.Sup.1]: user requirements of good flow of the video image for use in sign language and lip reading should be considered so that when conditions call for quality sacrifice, firstly spatial resolution is reduced and then, as a last resort, the temporal resolution.

www.itu.int/ITU-T International Telecommunication Union

Accessibility in Emerging Technologies
 It is important for new emerging networks and services, for example NGN, to consider accessibility from the very beginning. When planning, developing, designing and distributing telecommunication equipment and services, developers should consider people with special requirements to ensure that they can gain the same benefits from information and communication technologies (ICT) as the wider population. Simply, it makes sound business sense for the largest number of people to have access to ICT. With the constantly evolving baby boomer market and a general increase in life expectancy, more and more people will find themselves with impaired hearing, sight, etc. It therefore becomes more and more important to recognize accessibility needs now and for the future. SG 16 works with other ITU-T SGs on accessibility, and its recently created checklist will help standards writers take into account accessibility needs in their Recommendations.

Examples of emerging technologies
 "Design for All" principles have been recognized in the NGN (next-generation networks) work of an early stage. Accessibility needs have been outlined by Study Group 16 and referenced in the NGN Release 1 specifications. IPTV requires captioning for the deaf and hard-of-hearing, along with live real-time voice descriptions for the blind, in order for it to be accessible. It will be important to account for these needs in future standardization work. Accessibility needs are also important in the Home Networking standards work taking place in the Joint Coordination Activity on Home Networking and in SGs 4, 9, 15, 16 and 17. In Cable TV, under the responsibility of SG 9, accessibility needs are also important. Another emerging technology in which ITU has a hand is Radio-Frequency Identification (RFID). While RFID applications are still in the early stages, the following scenario could be envisaged: someone who has accessibility needs and is equipped with an RFID tag approaches a telephone; the RFID reader in that phone recognizes that the person is deaf and makes the necessary adjustments. For this type of application to work on a universal scale, international standards are imperative.

What is Total Conversation?
 Total Conversation is an ITU Service description found in ITU T Rec. F.703 and covers videophony with real-time text. A Total Conversation Service is an audiovisual conversation service providing bidirectional symmetric real-time transfer of motion video, text and voice between users in two or more locations. This real-time text differs from instant messaging systems because it is the bidirectional transmission of one character at a time. This gives the user the feel of real-time communication, just like voice or video systems that transport streaming media over IP. The concept is aimed at providing rich media real-time conversation for all people and for varying situations. This includes, but is not limited to, people that are disabled in some way, e.g. the deaf or hard-of-hearing, blind, etc., but also people who find themselves in a situation where the complementing media – video and real-time text – together with voice fulfil the conversation needs much better than only voice.

Accessibility
 Communication Opportunities for All

Accessibility Guidelines
 In order to provide general guidelines for standards makers, ITU T SG 16 developed F.703, a Recommendation on telecommunication accessibility guidelines. It will enhance the planning, developing, designing, and distributing of all forms of telecommunication equipment, software and associated telecommunication services. The aim is to improve accessibility for older persons and persons with permanent or temporary disabilities.

Total Conversation: One Platform for Voice, Video and Text

workshops: www.itu.int/ITU-T/worksem/
 e-flash and news: www.itu.int/ITU-T/news/
 membership: www.itu.int/ITU-T/membership/
 technology watch: www.itu.int/ITU-T/techwatch

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Total Conversation (F.703)

A central concept in accessible communication, joins real-time text, video and voice communication in one mainstream telecom service useful for all.

Type, sign, show, talk - all in the same call



Video telephony



Text telephony



Voice telephony



Defined by ITU-T SG 16. Interoperability is a main driving force (gateway support).
Accessible replacement of Voice Telephony.

Relay service scenarios

Scenario I



Relay type:

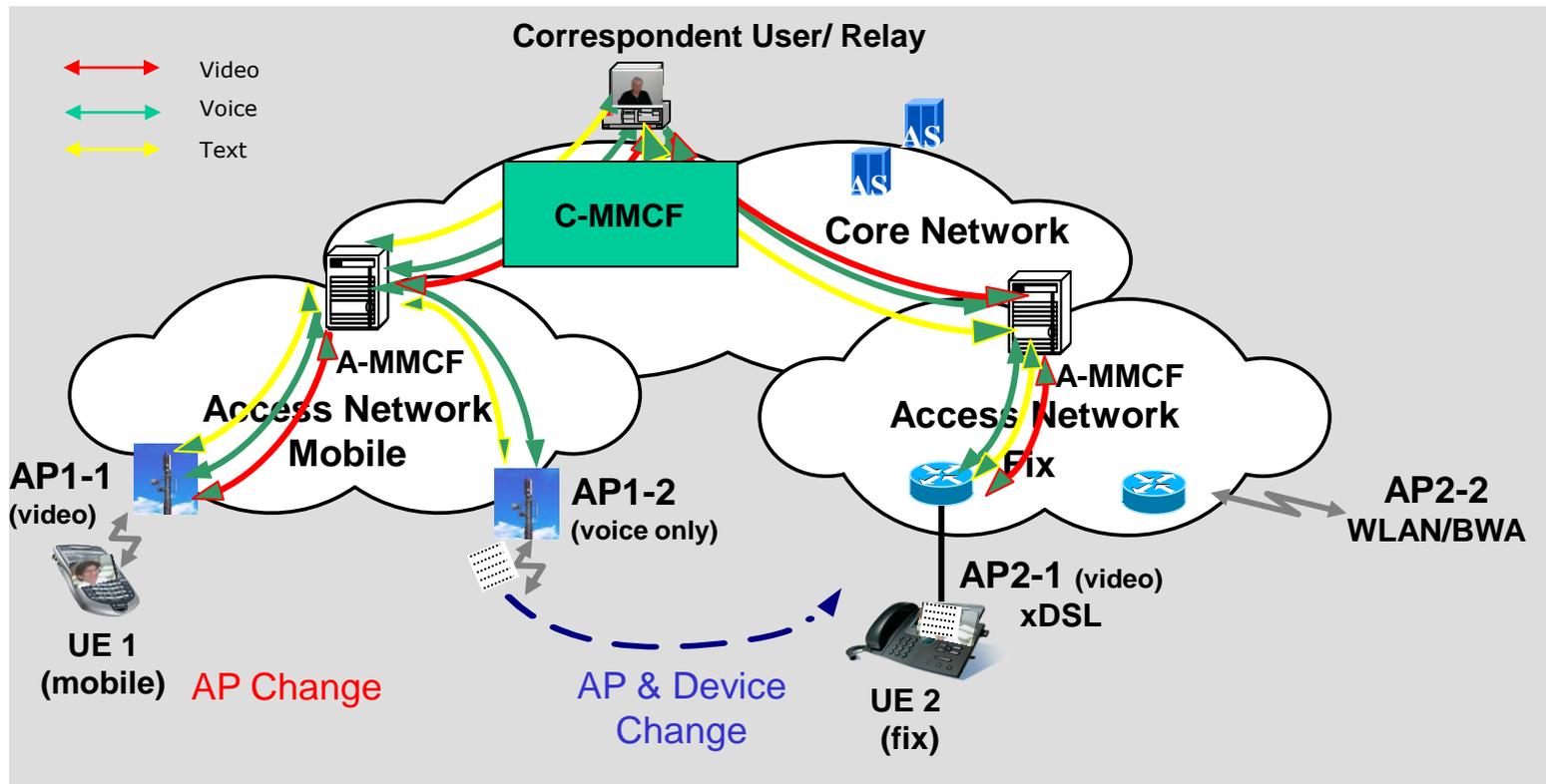
- Sign relay
- Sign – and text relay
- Text relay
- Captioned text relay
- Speech-to-speech relay

Scenario II



Scenario III





- Movement of UE1 requires handover to AP1-2 (no video streams)
- If the user profile of one of the communication partners mandatory requires video or in case of integrated text streams the call has to be terminated. Otherwise the video stream component of the conversation is terminated
- Text stream **mandatory** for **deaf** persons
- The user forces a handover from mobile device UE1 to fix device UE2

Everything done?

Definitively not!!!!!!

- Support of separate video, voice and media streams on cellular device and network infrastructure side necessary
- Provision for different types of disabilities (defined by the user profile) in mobility management

	Type of media stream			Suitable for handicap		
	Video	Voice	Text	blind	deaf	mute
media stream availability	X	X	X	✓	✓	✓
	X	X		✓	✓	✓
	X		X	✓Braille	✓	✓
	X				✓	✓
		X	X	✓	✓	✓
		X		✓		
			X	✓Braille	✓	✓

Decision on service termination or degraded service continuation depends from type of handicap

- Consideration of different type of relays
- Generally: Not only a public service section in recommendations but also a special Appendix indicating the location of the mainstreamed accessibility features within Recommendation itself

A good example: accessibility support by future AMS terminals (Q.12/16)

- AMS will allow a device to register and receive a notification of an “alerting” event
 - This device could be a **lamp that flashes**
- The same mechanics can drive all kinds of inter-application communication
- Given the architecture and applications possible, an assortment of new kinds of **automated and human translation services** should be possible
 - An application could provide real-time speech-to-text
 - Applications could invoke services of human translators

Resources

- UN Convention on the rights of persons with disabilities
→ <http://www.un.org/disabilities/default.asp?id=269>
- ITU-T technical flyers:
→ http://www.itu.int/dms_pub/itu-t/oth/1D/0C/T1D0C0000040001PDFE.pdf
- SG13 webpage:
→ <http://itu.int/ITU-T/studygroups/com13>
- SG16 webpage:
→ <http://itu.int/ITU-T/studygroups/com16>
- JCA AHF: Joint Coordination Activity on Accessibility and Human Factors → <http://itu.int/ITU-T/jca/ahf>
- ITU Accessibility web page:
→ <http://itu.int/accessibility>

Summary

- Interoperability is the most essential accessibility requirement behind communications for all but detailed consideration of accessibility support in the mobility management of FMC networks will gain significant relevance
- Accessibility support has been generally implemented according to the checklist in major NGN related recommendations. Nevertheless this effort has to be continued for extensions of the NGN architecture as well as for future network architectures
- It is easier to get standards created than implemented. For creation, use the Accessibility checklist and Accessibility guidelines.
- For implementation, encouragement from society to implement accessibility features is urgently needed. A number of mechanisms must be applied to reach society goals.