Title: **Physical layer capabilities to be included in Release 99**

Source: **Omnitel Pronto Italia**

1.   Introduction

There has been considerable discussion on the e-mail reflector related to the issue of UE capabilities. A joint contribution by several operators [1] sparked this discussion. However, it seems that the underlying message of that contribution has been misinterpreted and the ensuing discussions obscured the goal. In this contribution we would like to reiterate the fundamental requirement we have related to physical layer capabilities and present our thoughts and understanding of the situation.

2.   Current understanding

The understanding we have is that TSG RAN #2 has asked the WG to identify what items will be specified in R'99. Furthermore, an ad hoc on UE capabilities between the TSGs asked the TSGs to define what items they see as mandatory for the UE (and not the network), so that TSG-T can coordinate the requirements and define appropriate UE classes.

We also remind WG1 of two important items; the first is that UMTS provides service creation capabilities and not the services themselves. Second is that services are out of the scope of RAN although the physical layer capabilities will allow the services to be supported.

Therefore, we will need to focus our efforts on what is to be specified irrespective of whether it is mandatory or not. The next step is to indicate what shall be mandatory for the UE to support from the physical layer point of view, i.e., items such as downlink transmit diversity and site selection transmit diversity.

3.   Time scales

According to the approved work plan in WG1, essential specifications are due for approval by the RAN at the end of April 99, while R'99 will be finalized by the end of December 99. This would allow for the first UMTS service to be deployed in spring 2001 where required.

For the sake of compatibility between R'99 and the subsequent releases essential UTRAN characteristics have to be included in R'99 despite deadline requirements for nations due to launch in 2001.

Basic requirements of all operators, members of the 3GPP organizational partners, should be taken into account when establishing essential physical layer capabilities.

4. Requirements

Basic requirements on physical layer capabilities can be classified as affecting
* network planning
* service availability and provision

4.1 Network planning

A distinction must be made between inherent features and enhancing features:
* Inherent features

  DTX DL (network and UE) used as a means to reduce the interference and to provide rate matching

* Enhancing features

  In order to plan a network effectively, features included in R'99 that have a maximizing impact on the coverage/capacity of the system must be considered mandatory at the UE side. As a result, an operator requiring to exploit these features will be able to plan the network accordingly and to provide service to all the users.

  We emphasis again that the network has to be dimensioned based on a set of physical layer features supported by all UE. Optional features cannot be taken into account while planning a network. Also note that from past experience in GSM some features which could have been seen as enhancing features have become inherent and indispensable tools. Regarding UTRA, we highlight the two most pertinent items

  * Site Selection Diversity TX (SSDT)
  * TX Diversity (open and/or closed loop)

Agreeing on a set of features, to be supported by all UE, would also facilitate roaming between network operators, which, after all is one of the main goals of defining a common standard.

There could well be other features that would require consideration to assess if their support should be mandated. These should be treated on a per item basis.

4.2 Service availability and provision

As indicated earlier, the scope of RAN and RAN WG1 does not include service-oriented aspects. However, close liaison with TSG SA and possibly TSG T is needed in order to establish what is required. To this point we reiterate the concept that we have highlighted in the past, in that we wish to market a new technology able to offer

before all superior quality, performance and capabilities as perceived by the subscribers.

Therefore the goal of UTRA is not to provide a service limited to speech or to data rates comparable to 2nd generation but rather to provide terminals with higher bit rates capabilities. Furthermore, it is desirable to limit the range of data speed capabilities of terminals on the market.

5.   Conclusion

Basic requirements for network planning to be included in R'99 should take into account the needs of all operator members of the 3GPP organisational partners.

Close liaison with SA as to the foreseen application and the requirements on RAN WG1 should be established.

6.   References

[1] Tim/Cselt, Vodafone, France Telecom, T-Mobil, Telia, Omnitel, Mannesmann Mobilfunk, Tdoc TSGR1-99040, "UE physical layer capabilities for UTRA (UMTS Terrestrial Radio Access", February 1999, Yokohama, Japan.