**TSG-RAN** ***RP-01-0229***
**Palm Springs, CA, USA, March 15-18, 2001**

**Source:** Lucent Technologies, Nortel Networks

**Title:** **HSDPA study item: the way forward**

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## Introduction

In RAN#7 a study item on High Speed Downlink Packet Access was approved for consideration. The aim of the study was to look at the feasibility and potential of various techniques for increasing throughput and peak data rates with decrease in delay. Different techniques have been proposed for HSDPA such as Adaptive Modulation and Coding (AMC), Hybrid ARQ schemes, Multiple Input Multiple Output (MIMO), Fast Cell Selection (FCS) and Stand-alone HS-DSCH in the context of multi-carrier cell.

## Feasibility Study Status

During the feasibility study example solutions were presented for the purpose of proving the validity of the concept on different techniques such as AMC, HARQ, and MIMO. The feasibility study reports [1][2] therefore concluded the viability of all these techniques and their benefit in achieving the goal of HSDPA. However, more work is still needed to define the optimum solution in every technique. Examples of these further studies are:

- For AMC: the best Modulation constellation with the best combination of channel coding still require investigation. Also, the type of scheduling algorithm, the interaction with HARQ, e.g. MCS variation during re-transmission etc are all issues that need to be addressed during the standardisation process.
- For HARQ: techniques such as chase combining, incremental redundancy, Rate compatible Punctured Turbo codes etc need to be addressed and compared in terms of performance and signaling overhead in the standardization process.
- For MIMO: few example solutions were presented in feasibility study to prove the concept but other schemes proposed at the last RAN1#19 should also be addressed and compared in terms of performance and complexity in the standardization process.

It should be noted that the feasibility study has only looked at data only services. The HSDPA work should include both voice and data services to evaluate the performance advantages in both cases.

## Proposal

Since all the different schemes proposed for HSDPA proved to be beneficial and feasible and in the light of the recommendation in TR 25.950 v2.0.0 [1], it is proposed that a set of work items is created in relation with the recommended concepts as an outcome of the

HSDPA feasibility study in order to allow the standardization phase to proceed in all working groups, with initial work in WG1 and WG2. It is expected that within these work items some may correspond to building blocks and others to sub-building blocks, some of which being applicable in isolation of others.

## References

[1] RAN WG2, “TR 25.950 v.2.0.0, HSDPA TR”, RP-01050
[2] RAN WG1 “TR 25.848 v1.0.0, WG1 HSDPA TR”, RP-010191