Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**A Usage Model of High Mobility Optimized Scenario**
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Re:	Respond to 80216m-07_004, Call for Contributions on Requirements for P802.16m -Advanced Air Interface
Abstract	This contribution describes a new usage model for the requirements of P802.16m.
Purpose	This contribution proposes a new usage model entitled high mobility optimized scenario to section 9.0 of the 802.16m requirement document; IEEE 802.16m-07/002.
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A Usage Model of High Mobility Optimized Scenario

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Introduction

This contribution proposes a new usage model entitled high mobility optimized scenario to section 9.0 of the 802.16m requirement document; IEEE 802.16m-07/002.

Description of Proposal

Typically, the wireless communication system is optimized for low speed (usually less than 30kmph) operation and with graceful performance degradation for speed up to 200kmph. However, we believe in some cases, it is beneficial to have the wireless communication system optimized for the high speed scenario, which is called as usage model for optimized high mobility.

For example, China is now constructing a nationwide high-speed railway network and by year 2010 it is expected that more than ten-thousand-kilometer rails will be completed. The typical cruising speed is expected to be 200kmph. Especially, in several high-end routes, for instance between BeiJing and ShangHai, the trains will run at 300kmph with the peak velocity of 350kmph. Furthermore, China also has magnetic train which can reach as fast as 431kmph. It is, therefore, extremely attractive to provide the passengers with a variety of communication services with different QoS requirement, such as high speed internet access, video telephony, video on demand, etc.

Moreover, as is the typical case in China rural area, the population that is near the railway is very small and requires very low data rate services. Consequently, the major revenue for the carriers in the railway deployment scenario comes from the passengers on the high speed train. Given the deployment of more high speed rail services, this deployment scenario will only gain more significance for the carriers and the industry

There are several challenges that we need to face.

- ➢ The average speed of train is in a range of 200kmph to 300kmph, with a maximum speed of up to 450kmph.
- ➢ The coverage of base station is likely to be in unit of 10km and is also likely to be irregular.
- ➢ The large penetration loss of the train, especially for higher-frequency carriers, should be considered.

Proposed Text in Usage Model Section

9.x Usage model: high mobility optimized scenario

The system or one mode of the system needs to provide services to high-speed users. It shall be optimized for speeds ranging from 200 to 300kmph with likely large penetration losses in a large and irregular coverage area.

For the high-speed user service environment, and even as the speed of the service environment may dynamically and rapidly change, the system should support dynamic link maintenance and burst profile management, with high granularity of differentiated service between subscribers, such that the air interface shall be optimized and balanced between reducing link level maintenance overhead and providing optimized burst profile and handover performance.