TSG-RAN Working Group 2 (Radio layer 2 and Radio layer 3) **TSGR2#2(99)374**
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Agenda Item:

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Title: **Relevance of speed measurement for Location services**

Document for: Decision

. Introduction

This document presents the advantages of having speed measurements for location services. For LCS, the mobile needs to communicate its position to the network: this implies transactions between UE and Network. It could be useful to optimise the number of LCS measurements reports sent by the UE. Speed measurement is a simple way to reduce the number of measurement reports and to save capacity

? Speed measurements interest

The aim of this simple model is to have a raw approximation of the gain introduced by speed measurements. We suppose that the LCS service is set up with an 100 meters accuracy in an urban environment.

Speed (Km/h)	V=0	0<v<10	10<v<30	30<v<60
Probability	30%	25%	25%	20%
UE report frequency to reach 100m accuracy (s^{-1})		1/36	1/12	1/6

*To reach the horizontal accuracy, the UE may send the position reports with a frequency, which depends on speed. For example, if UE's speed is 20 km/h, the UE has to send a report every 100/(20*1000/3600)=18 seconds.*

Middle LCS-report frequency with speed measurement (s^{-1})	0,061
Middle LCS-report frequency without speed measurement (s^{-1})	0,16

We see, with this simple model, that speed measurement reduces signalling, and improves Network capacity. The question is how those measurements should be performed and where. The first question is WG1 relevant, and we propose to send a LS to WG1 to know whether speed measurement are possible, and to give some precision about it (accuracy, possible measurement frequency). If speed measurement are feasible, we propose to include it mandatory in the standard. For the second question (where), we believe that speed measurements should be performed in the mobile. The Node-B solution exists too, but creates additional signalling, since Network has to communicate some information about LCS-report frequency to the mobile. With the other solution (measurements in the mobile), the UE decides autonomously the LCS-report frequency, with the knowledge of thresholds values, and signaling is reduced (In this later case, threshold values are nevertheless sent by Network to UE) However, the question of speed-measurement place (mobile, network or both) is opened for further discussions.

We can stress the fact that, in addition, speed measurements should be useful for other aims, such as radio resources management, or Handover preparation.