Machine-to-Machine Focus Group (M2M-FG)

Connected Vehicle (CV) Vertical Study

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1 Executive Summary

1.1 Problem Statement

The purpose of the Connected Vehicle (CV) study is to ensure how Information and Communication Technology (ICT) capabilities can be incorporated into vehicles and roadway/roadside infrastructure comprising the transport system. CV was chosen as a focus area because it is an important emerging technology that has the potential to increase the safety and efficiency of American roadways, resulting in fewer fatalities, increased fuel savings, and more efficient transportation. Utilizing a number of CV use cases, the CV Focus Group assessed the optimal use of ICT capabilities to improve the safety, efficiency, reliability, and cost effectiveness of the current and future transport sector. The chief goal and key outcome of this study is the identification of various common service layer functions and their inclusion into a wider industry analysis.

1.2 Scope of Effort

This effort focuses on surface transportation addressing both passenger and commercial vehicles. It does not address the use of ICT technologies in the air, marine, rail, or space domains. Applicability to pedestrian or non-motorized transport is only peripherally considered (e.g., in cases like intelligent intersections). This study excludes use cases related to vehicular safety due to challenging latency requirements (<500mSec latency).

1.3 Assessment and Conclusions

The telecommunications community can provide added value within the scope of CV. This analysis has sampled use cases from various national and international efforts. The use cases were chosen to provide a diversity of scenarios and requirements. The Connected Vehicle Focus Group (CV-FG) found that many of these use cases were “low hanging fruit.” The requirements were quite compatible with the mobility and service capabilities existing in today’s mobile networks. Reuse of cellular technology could provide a less expensive alternative to deploying a Dedicated Short Range Communications (DSRC) infrastructure at 5.9 GHz.

In addition to just the mobility aspects, it should be noted that there are many well established concepts within the telecommunications industry that can be applied to problems in the transportation sector. These include: mobile payments (paying from your vehicle), roaming and reconciliation (when electric vehicles charge away from home), trusted execution environment (secure processing of things like tolls and payments), and secure communications. The focus group found that CV shares many service requirements with other verticals. This study identifies several aspects where it would make sense to provide capabilities within a common service layer.

1.4 Recommendations

The focus group strongly suggests that ATIS should push for organizations such as RITA to adopt cellular communications as an alternative communications technology that can be used as a complement to DSRC in many cases (i.e., vehicle-to-infrastructure communications). It should be noted that this establishment of cellular access as an alternative has happened within ETSI ITS TC and ISO TC/204, but has not occurred within the US. We further recommend that any actions by ATIS or ATIS members that promote applicability of cellular technologies for connected vehicle should be encouraged.

It was observed that many solutions, with both standards-based and non-standards-based aspects, already exist within the cellular world to solve problems now emerging with Connected Vehicle. GSMA is examining many of these issues within the EMTA (Embedded Mobile Transport & Automotive) project. It is recommended that ATIS communicate the use cases examined by this focus group to GSMA to ensure that these are being considered.