# SDR Forum Workshop on
# Smart Communications for Transportation Systems
# 18 June 2009 in Dearborn, Michigan

Modern transportation systems on air, land and sea make extensive use of radio communications technologies to support vehicle navigation, transportation safety, asset tracking and infotainment. There are a number of technical and business challenges associated with these technologies that are unique to the transportation sector:

- **Disparate wireless standards –** Transportation systems often utilize multiple communications standards: GSM, GPRS, 3G, WiFi, WiMAX, DSRC at 5.8GHz and 5.9GHz, GPS, Galileo, NFC, Bluetooth, Satellite, etc. Vehicle manufacturers using traditional radio technologies must embed a separate radio set within the vehicle infrastructure for each supported standard, often at considerable cost, even though only a few of these standards are in use at any given time.
- **Regional requirements** – The requirement to support multiple communications standards is compounded when selling and operating vehicles across international boundaries. As technologies evolve, local regulatory requirements on wireless communications as well as regional differences in interpretation of standards and legislated safety requirements can force vehicle manufacturers to support an even wider range of radio configurations for each vehicle model.
- **Product life cycles** – Vehicles are typically three years in design and can be in service for ten or more years. Communications technologies, on the other hand, tend to evolve much quicker, with new standards emerging every three to five years. Updating a vehicles communications package to support these evolving wireless standards while the vehicle is in service can lead to significant life time service costs for the vehicle manufacturer.

The use of software defined and cognitive radio technologies by vehicle manufacturers provides an efficient and comparatively inexpensive solution addressing these challenges. Through SDR, a single radio set can act as a "common platform" to support multiple radio standards, significantly reducing manufacturing costs, logistical support, and operating expenditures. Regional differences can be accommodated through location based "software loads", allowing separate radio "personalities" addressing the requirements for each jurisdiction. And finally, support for new standards, new features and new capabilities can be added to be added to a radio while in service, either through over the air-reprogramming or during regular vehicle service.

This workshop will allow vehicle manufacturers and government officials world-wide to come together with leading experts in reconfigurable radio technologies to realize the technical and business advantages offered by SDR and CR technologies in modern transportation systems. Topics included in the workshop will include:

- Communications requirements in modern transportation systems
- Use cases and business models for SDR and CR in vehicle communications
- Radio architectures supporting vehicle communications
    - Commercial
    - Broadband
    - Satellite
    - RFID
- Software download and communications security
- Issues associated with safety critical communications