tutorial

# Telematics: The Next Revolution?

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By some statistics, people in the United States spend an average of about 340 hours in the car while driving and 200 hours as a passenger. These data certainly generate motivation to provide a host of services ranging from a bare necessity to a luxury. The rise of information technology and wireless communication appears to offer powerful tools in order to cover this wide spectrum of customer services. The field of telematics in the automotive industry refers to wireless voice and data communication between a car and somewhere else. The market growth of telematics is enormous and forecast estimates as high as $30 billion dollars are made for the year 2010, see Table 1. Imagine that you are visiting a town for the first time and are in need of information such as traffic condition, direction to points of interest and possibly hospitals, and to be able to check your emails as well. To achieve this, a number of companies (Delphi Automotive Systems, Motorola, Visteon, Siemens Automotives, etc. ) build onboard telematics equipment, such as antennas, transmitters and interfaces. Knowing a car's position is essential for emergency and navigation services. This is achieved through a cluster of satellites and the Global Positioning System (GPS). Wireless networks is an important part of the entire system. Telematics service providers have partnered with existing wireless companies to allow nationwide access. The car transmits information to these wireless services which then is routed to telematics centers. Telematics centers coordinate all the information and services delivered to the car, using both the internet and their own databases. Web-based services such as Yahoo, AOL Time Warner,

| | Year | | | | | |
|---|---|---|---|---|---|---|
| Estimate By | 2000 | 2001 | 2002 | 2003 | 2005 | 2010 |
| Roland Berger Strategy Consultants | | $5.3 Billions | | | | $30 Billions |
| Strategies Group | | | | | $5 Billions | |
| Allied Business Intelligence | $1 Billion | | | | $8 Billions | |
| UBS Warburg | | | | | | $47.2 Billions |

**Table 1: Estimated Equipment and Sales Revenue in US**

Reuters Group, ComRoad and others deliver the personalized information drivers want in their vehicle.

For example, GM has the OnStar service where subscribers can communicate by voice to a central information site while in the car and driving. Similar telematics services are also available by other car makers and related companies. They include, for example, TeleAid by DaimlerChrysler, Assist by BMW, Ford/Qualcomm's Wingcast, and Quick-Scout by Siemens Automotive. Telematics services consist of four general categories. Productivity (e-banking, stock quote, audible email, etc.), convenience (route guidance, weather information, news , sports, etc.), and entertainment (MP3 music, games, movies, etc.) services are the three categories of services offered by telematics. The fourth is for engine and other applications which will use data collected by onboard computer to provide such tools as remote diagnostics, software upgrades and smart ordering of replacement parts. This technology would allow carmakers or dealers to alert an owner when his/her engine malfunctions and could even retune the engine when the vehicle is parked late at night. Both voice activated commands (through speech recognition software) and visual controls are used in these systems. Obviously, not all these services are available to the driver at all times, particularly while driving. The main reason is the driver distraction. Table 2 shows results of some studies on driver distraction by a variety of factors, in particular the use of cell phones. The recent ban in cell phone usage during the driving in New York and other countries (such as Portugal, Australia, Brazil, Chile, Germany, Israel, Italy, Japan, Philippines, Singapore, South Africa, Spain, Switzerland, and the U.K.) and other limitations in Europe can have a braking effect on the growth of the telematics field. However, multimillion-dollar, advanced six-degree-freedom simulators are being used by many companies (Ford, Johnson Controls, GM, etc.) and National Highway Traffic Safety Administration (NHTSA) to thoroughly investigate effects of a host of many telematics-related driver tasks on driver distraction. Results of such studies should be useful in identifying and designing control methodologies to minimize such distractions.

| Distraction Data | | |
|---|---|---|
| 1.5% of all accidents caused by: | | Cell phone while driving |
| **8.3% of accidents caused by** | | **Distractions** |
| Of these 8.3%: | 29.4% caused by: | Outside the car distractions |
| | 11.4% caused by: | Audio system adjustment |
| | 10.9% caused by: | Speaking with passenger |
| | 2.8% caused by: | Climate control adjustment |
| | 1.7% caused by: | Eating or drinking |
| **Study by Response Insurance** | | |
| 29% of the survey stated: | | They used a cell phone when driving |
| Of these 29%: | 13% stated: | Using phone caused or almost caused accident |
| *Study Funded by AAA* | | |

**Table 2: Distraction Data, University of North Carolina, Highway Saftey Research Center**

Finally, with the installation of intelligent sensors and actuators, many automakers expect that eventually every car will be able to monitor its own health. For example, if your car detects a problem, it may communicate that information to your garage, and even consult your calendar to schedule a convenient service appointment. Speed and location sensors can be used to update traffic reports as well. Already, some two million drivers use such systems – most commonly, GM's OnStar service. With all of these technologies in action, there appears to be a revolution of a new kind in the automotive industry.