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Telematics

Past, Present and Future

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I. Introduction

Telematics is a hot topic in the industry today with articles appearing in various trade publications. This report will include a brief history of telematics, how a telematics system functions and its practical applications. The purpose of this report is to provide information that can be used to determine the impact of telematics on the independent automotive service and repair industry.

Close attention will be paid to the automotive telematics systems that provide remote diagnostics, which allow a vehicle's built-in systems to identify a mechanical or electronic problem and via the telematics package, automatically share this information with vehicle manufacturers and service organizations.

The conclusion of the report should indicate that, as with previous technological changes, the aftermarket will rise to the challenge and find its place in the telematics market that will allow the independent repair facility to be an active participant.

II. Brief History of the Global Positioning System

To understand telematics, we begin with a description of the global positioning system (GPS) because without GPS, there would be no telematics. GPS is a technology that is ideally suited to both navigation and positioning.

GPS technology originated in the U.S. military. The Defense Department recognized the need to have a precise positioning technology to locate soldiers, vehicles, enemies and supplies on a battlefield and monitor their movements. The GPS was developed to fulfill this important military need and included a satellite network, ground communications stations and receivers. It is the only fully functional satellite navigation system. Currently, more than two dozen GPS satellites orbit the Earth, transmitting radio signals that allow GPS receivers to determine their location, speed and direction.

On March 29, 1996, President Bill Clinton signed a Presidential Decision Directive (PDD) that changed the categorization of GPS to an international information utility. The PDD included the following relevant points:

1. The U.S. government will continue to operate, maintain and provide basic GPS signals worldwide, free of direct-user fees.
2. The United States will advocate the acceptance of GPS and its augmentations as a standard for use by initiating international discussions in agreement with Japan and Europe.

Currently, the GPS is operated by the U.S. military, but it is used by both military and commercial groups.[1]

Since the first experimental satellite was launched in 1978, the GPS has become indispensable for navigation around the world and an important tool for map-making,

land surveying, tracking and determining location. One lesser-known potential application is its ability to provide a precise time reference used in many applications, including scientific study of earthquakes and synchronization of telecommunications networks. Also, it can provide precision timing to people using the products to ensure that users at different locations are synchronized to the same time.[2]

Here's a simplified explanation of its operation: The GPS is a system of satellites, computers and receivers that are able to determine the latitude and longitude of a receiver on Earth by calculating the time difference for signals from different satellites to reach the receiver. A GPS receiver calculates its position by measuring the distance between itself and three or more GPS satellites. Measuring the time delay between transmission and reception of each GPS radio signal gives the distance to each satellite because the signal travels at a known speed.

The signals also carry information about the satellites' locations. By determining the position of, and distance to, at least three satellites, the receiver can compute its position using trilateration. Receivers typically do not have perfectly accurate clocks and therefore track one or more additional satellites to correct the receiver's potential clock error.

Trilateration is a method of determining the relative positions of objects using the geometry of triangles in a similar fashion as triangulation. Unlike triangulation, which uses angle measurements (together with at least one known distance) to calculate the subject's location, trilateration uses the known locations of two or more reference points, and the measured distance between the subject and each reference.[2]

Below are three options for a vehicle to be retrofitted with a GPS unit if it was not factory-installed[3]:

1. **Portable GPS:** This installation is not permanently integrated into the vehicle. It is surface-mounted onto the dashboard and is powered by the vehicle's cigarette lighter. This option is low-cost and portable.
2. **Original Factory Equipment:** Vehicle manufacturers offer GPS as an option for those vehicles that did not ship with GPS. The primary benefits are an integrated and factory-standard installation.
3. **Aftermarket:** A number of manufacturers supply aftermarket GPS units that can be integrated permanently into the vehicle. A typical location for such an installation is the DIN slot for the radio/tape/CD. Benefits include a more cosmetic appearance than a portable device, and less expensive than factory-installed.

III. What is Telematics?

It is not easy trying to find a common definition for telematics. The definitions vary depending on the information source.

One of many definitions is the integrated use of telecommunications and informatics, also known as information and communications technology (ICT). More specifically it is the science of sending, receiving and storing information via telecommunication devices.[4]

Another definition is a wireless communications system designed for the collection and dissemination of information that particularly refers to vehicle-based electronic systems; vehicle tracking and positioning; online vehicle navigation; and information systems and emergency assistance.[5]

Or, there is an easier definition by Dennis Foy, who states "telematics is the transmission of useful information to and from a vehicle."[6]

Now that telematics has been defined, it may be useful to know the difference between telematics and navigation systems. A telematics system uses GPS technology to provide numerous services to drivers; navigation is simply one of the services offered.

There are two types of navigation systems. The first is an autonomous navigation system where the navigation database resides on a CD in the car. The second is a telematics system that provides navigation assistance "off-board," which means the database resides outside the car, making the service more affordable to a wider number of people.

The telematics system within the car is comprised of a telematics communications unit (TCU) that is connected wirelessly to a central service center. The TCU serves as the central platform of a telematics system, where all telematics-related technologies are deeply integrated. It communicates location-specific information to a central service center, and in turn, the center helps deliver telematics services to a driver via cellular phone. The TCU is also connected to the engine control unit (or the on-board computer), which enables enhanced services such as remote engine diagnostics and automatic airbag notification.[7]

Telematics is an emerging market of automotive communications technology that combines wireless audio and visual data to provide location-specific security, information, productivity and in-vehicle entertainment services to drivers and their passengers. Telematics can be divided into two groups:

1. Features related directly to operating, locating or maintaining the vehicle.
2. Features enabling the use of certain applications that were once used outside the vehicle, i.e. in the home and office.[8]

Telematics has three basic principles[9]:

1. two-way communication capabilities (wireless);
2. location technology (geographic position); and
3. computing platform for system control and interface to automotive electronics system(s).

IV. Brief History of Telematics

For vehicle technology, all the pieces came together in the 1990s: GPS, cell phone technology and the Internet. Telematics emerged as the means to link the automobile to satellite-based positioning technologies via wireless connectivity, enabling audio or visual data and drivers to connect.[8]

A telematics system offers drivers emergency and roadside assistance, airbag deployment notification, navigation, remote door unlock, vehicle security notification and stolen vehicle tracking services. Drivers activate telematics systems via buttons located on the dashboard or an overhead console of the car.

With the explosion of cell phone, computer and electronic entertainment use, there was a growing interest among motorists to extend these capabilities into their automobiles.

Some telematics service providers (TSPs) wanted to provide more than just a help line by offering a variety of services, incorporating in-car DVD players, GPS, hands-free cell phones and other telematics into vehicles. Telematics could feasibly provide 24/7 automobile monitoring and, at the same time, a safe communications link.

Telematics systems have evolved from the concept of one company putting the whole system together to the realization that specific areas of expertise in hardware, software or other vital services can be provided by individual companies.[10]

V. Inside a Telematics System

Hardware suppliers provide the devices that send and receive wireless signals. The in-car hardware usually consists of the infamous “black box” module mounted behind the dashboard that integrates a phone, GPS receiver, digital signal processor and microphone for voice recognition. It also taps into the vehicle’s electronic bus to gather diagnostic information from sensors.[10]

Another key piece is the back-end server, which operates like those used to power the Internet. It handles all the applications that require lots of power (for example, analyzing engine diagnostic data) so the on-board modules can be simpler and less expensive. Because back-end servers don’t have to meet the same temperature and vibration testing required for on-board automotive electronics, servers can stay on the leading edge of processor speed.[10]

Software suppliers would provide the infrastructure and/or specialized applications. Applications are developed by companies ranging from module suppliers to component suppliers to smaller software companies that specialize in a particular telematics function. The companies stake out applications relating directly to their devices or expertise, rather than supply an entire application package.[10]

The operating system is the basic piece of software infrastructure for automotive telematics and requires stability. Developers recently have been adding functions such as Bluetooth and voice recognition to reduce the customer application that makers have to undertake. On the server side, infrastructure software is needed to make the secure "handshake" connection between the car and the back end.[10]

According to the Minnetonka, Minn.-based Telematics Research Group, portable navigation devices (PNDs) and personal digital assistants (PDAs) represent the next generation of Pocket PCs and other small computers. Some predictions indicate that a PND could be all of the following: cell phone, navigation system, media player, calendar and phone book.[11]

Other important groups involved in this technology include the telematics service providers for call centers and the analysis of diagnostic information; the wireless carriers for the bandwidth; content providers that generate the information sent to the vehicles; and last but not least, the original equipment manufacturers (OEMs) that must ensure that it all comes together and meets their brands' needs.[10]

VI. Europe vs. North America

Europeans and Americans are interested in navigation, safety and security services, but the priority varies. In Europe, there is a greater emphasis on navigation technologies because of frequent cross-border travel that creates language barriers; familiar navigation and security services provide less stressful travel.[8]

The United States and Canada prefer safety and security to navigation. One common thread among drivers of all countries is that they are interested in getting real-time traffic information.[7]

The growth of telematics in North America will depend on digital cellular standards that provide service over a larger geographic area, especially in the cities. This presents a problem in North America because there are multiple standards, unlike Europe where digital technology is already established and the telematics system uses the digital standard, Global System for Mobile Communications.[7]

During the 2007 Telematics Update conference in Detroit, it was reported that by the end of 2008, all the major automakers will be pursuing their telematics strategies and one prediction was that by 2011, telematics safety functions will be standard on all vehicles.[12] Other telematics services under discussion ranged from roadside assistance and emergency notification to maintenance notifications, off-board navigation, traffic information, infotainment, and future offerings of collision avoidance and advanced driver assistance services (ADAS).[13]

VII. Practical Applications of Automotive Telematics

There are numerous applications, services, software packages and hardware under the telematics banner. Currently there is no "all-in-one-solution." Today's driver may have multiple independent systems all wirelessly connected to his or her vehicle: cell phone, OnStar emergency service, Blackberry and a tag for automated highway toll collection.[24]

Some current or future applications of automotive telematics include[4]:

- **Vehicle tracking** that monitors the location, movement, status and behavior of a vehicle or fleet. This is achieved through a combination of a GPS/Global Navigation Satellite System (GNSS) receiver and an electronic device [usually comprising a Global System for Mobile Communications (GSM) and General Packet Radio Service (GPRS) modem] installed in each vehicle. These components communicate with the user (dispatching, emergency or coordinating unit) and computer- or Web-based software. The data is turned into information management reporting tools in conjunction with a visual display on computerized mapping software. Advanced vehicle localization systems for public transport may employ odometry instead of GPS/GNSS.[4]

- **Trailer tracking** follows the movement and position of an articulated vehicle's trailer unit. It uses a location unit fitted to the trailer and a method of returning the position data via mobile communication network or geostationary satellite communication for use through either computer- or Web-based software.[4]

- **Satellite navigation** technology uses GPS and an electronic mapping tool to enable the driver of a vehicle to locate a position, then route and navigate a journey.[4]

- **Mobile data** employs wireless data communications by using radio waves to send and receive real-time computer data to, from and between devices used by field-based personnel. These devices can be fitted solely for use while in the vehicle (fixed data terminal) or for use in and out of the vehicle (mobile data terminal).[4]

- **The introduction of real-time** traffic data to the in-vehicle navigation systems occurred in 2005. The driver is provided alternative routes when commuting to/from work or when traveling. The application has been impressive but has presented some problems with the accuracy and timeliness of the traffic data itself.

- **Intelligent Transportation Systems** include automated highway and traffic control systems, the integration of private and public transport and tolling technology for bridges, highways and urban areas.[6]

- **Dedicated Short-Range Communications (DSRC)** are wireless systems used to communicate over distances of less than 1,000 feet (300 meters). They can be used for vehicle-to-roadside (VtR) or vehicle-to-vehicle (VtV) applications. The systems are primarily deployed using radio frequencies; other options include infrared (IR), or low-power laser.[15]

  DSRC systems consist of roadside units (RSUs) and the on-board units (OBUs) with transceivers and transponders.[16]

  This technology is currently being tested but could be seen in vehicles as early as 2009.[17]

- **Widespread acceptance** of telematics will be advanced by commercial fleets, which use GPS to track vehicles and cargo. Telematics provides the means for a company to know the location of every vehicle or how the vehicle is driven.

  Netistix, a Canadian company started in 2002, services customers all over North America. Its technology, known as FleetPulse, can collect a wide range of data that the fleet manager can decide what is or is not relevant. Each vehicle is equipped with a device ($400/vehicle) that plugs into the diagnostic port of the vehicle – OBD-II or J1708 on heavy-duty vehicles. The device comes with Wi-Fi and Bluetooth wireless communication ability. Once installed, this system will report what's happening with the vehicle – emissions control data, oxygen sensor performance, fuel consumption, diagnostic trouble codes, whether or not the check engine light is on, etc.[18]

  Another company, Networkcar, offers an integrated GPS tracking and diagnostic monitoring system for wireless vehicle management. Currently, it is primarily aimed at fleets. The system plugs into an on-board diagnostic port to send wireless information to a secure Web site.[19]

- **Radio frequency identification (RFID)** is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. An RFID tag is an object that can be applied to or incorporated into a product, animal or person for the purpose of identification using radio waves. Some tags can be read from several meters away and beyond the line of sight of the reader.

  This technology has been employed by major aftermarket suppliers and retailers to improve the efficiency of inventory tracking and management. Other current uses include passports, transportation payments, product tracking, car keys and animal identification.[20]

VIII. Remote Diagnostic Services

Current automotive telematics offerings are consumer-oriented, but enabling interconnectivity with vehicles also provides vehicle manufacturers with valuable tools: remote diagnostics, vehicle relationship management (VRM) and customer relationship management (CRM).[8]

Remote diagnostic services and CRM can benefit both manufacturers and consumers. The car's computer system will be able to detect any anomalies within its system. If immediate action is required, telematics providers will have the ability to contact the driver and inform him or her to bring the car in for service. The manufacturer may benefit greatly as this type of monitoring can alleviate some of the problems associated with recalls of faulty devices. Increased vehicle reliability and decreased costs of warranty repairs can be realized from remote diagnostic services.[8]

CRM provides manufacturers with after-sales contact with the consumer, with the goal of building a relationship with the consumer to retain the vehicle owner for future products and service. With CRM, manufacturers have the potential to keep in regular, even daily, contact with the consumer.[8]

The real value in automotive telematics for OEMs is in back-end benefits: Improved CRM, increased notoriety as an industry leader, and higher brand awareness may bolster long-term relationships with customers. In addition, the after-sales revenues and savings generated by real-time monitoring of vehicle systems or VRM, are as great or greater a value than monetary gains from the normal revenue stream.[8]

IX. Internet Accessibility

Another convenience offered by automotive telematics is the ability to access the Internet for information. It is important to note that the use of the Internet in cars and trucks is still in the beginning stages. Safety issues, such as driver distraction, remain obstacles to Internet access in cars and trucks, but solutions such as voice-enabled systems have been tested and are on the horizon.[8]

X. Consumers – Demand vs. Cost

According to a survey of 500 consumers released by Accenture in April 2006, more than eight out of 10 U.S. car owners want some form of in-vehicle technologies, including telematics, in their cars, with safety and security features being the most desired.[21]

Eighty-four percent wanted in-vehicle technologies including telematics. Other desired choices included stolen-vehicle tracking, remote door unlock and vehicle diagnostics. Seventy-one percent indicated they would pay more than $50 for factory installation and be willing to pay a monthly fee. An interesting note, however, is that half of the respondents indicated they do not currently have the in-vehicle technologies they desire

because of the high cost, and 47 percent stated that the technology was not available when the vehicle was purchased.[21]

Another popular feature among some consumers is navigation technology. Either DVD- or GPS-based navigation, consumers are in favor of these electronic systems over traditional fold-out maps. More advanced telematics services provide audio directions or even a live operator giving turn-by-turn directions – the driver's eyes never need to leave the road.[8]

But other consumers may prefer to print out driving directions via the Internet – at no additional expense. Motorists want the choice of customizing their vehicle options; some will want the latest in accessories and technology while others just want to drive their cars without any additional distractions.

Other items on the consumers' "wish list" are stolen-vehicle tracking, remote door unlock, travel information (traffic updates, parking availability and airline status), messaging (voice mail and e-mail retrieval), information (sports, weather, stock market updates and Internet access) and entertainment (audio games, books, magazines and newspapers). Nearing the bottom of the list would be vehicle service or repair alerts and maintenance reminders.

For automotive telematics to be a success, it needs a core application that is used regularly, not just when airbags deploy. The average U.S. consumer has shown a reluctance to purchase and/or subscribe to a service they hope never to use. Consumers, familiar with telematics services as offering only safety and security, downplay its importance in comparison to other safety features they think they do not have to continually pay for, i.e. airbags or electronic stability programs. Consumers also are showing a preference for a wireless network.[8]

The challenge with telematics services is getting customers to pay for premium services such as customized news or location-based services. Currently, only a fraction of telematics customers are willing to pay for these services. Flexible payment and billing options could appeal to the majority of motorists.

A recent survey of more than 400 current telematics users conducted by Ducker Worldwide, showed renewal rates for telematics at 50 percent. This percentage is low compared to the approximate 80 percent renewal rate telematics service providers need to remain profitable[8]:

> "The monthly figure that appealed to 40 percent of the consumers was $8 per month for the most basic level of service. This is an interesting finding given that many TSP business models are targeting a higher level of service as the key to their profitability."

At $8 per month, yearly service fees would amount to $96 for basic service, more than 50 percent less than the $200 charged to some annual subscribers. Perhaps the root cause for

low resubscription rates is the consumer's unwillingness to pay more than the service's perceived worth. [8]

A dream come true for the manufacturers would be that all the motoring public would see telematics as a "must have" feature with no hesitation on the cost. But that will probably not happen, at least not in the immediate future.

Outside of cost, there's another potential problem on the horizon: driver capability. As of January 2008, five states, the District of Columbia and the Virgin Islands all have legislation that bans use of a handheld cell phone while driving, according to the Governors Highway Safety Association.[41] Similar laws have been implemented in a number of countries. Responsible use of telematics services by drivers will be a critical issue and has the potential of a huge liability risk to manufacturers.[22]

XI. Who Pays to Get Telematics into the Vehicles?

Advocates believe automotive telematics can provide tremendous benefits to consumers, as well as to companies. But, who pays to get telematics into the vehicles? Here are the three most probable choices:[23]

1. Customers, through monthly subscription fees.
2. Automakers.
3. Third parties who intend to mine data from vehicles.

On the surface, the customer subscription model is the first choice because it's in use by the current industry leader, OnStar. Convincing automakers to pick up the tab for installing telematics hardware based on projected benefits may be the best way to get the high installation rates necessary to drive the industry.[23]

Many believe that telematics would be a mass market if hardware were installed by the automaker. But consider that if even one automaker could put the same TCU on every vehicle manufactured in one year, it would still leave 93 percent of the vehicles on the road without that TCU.[24]

Expecting third parties, such as radio ratings services, to pay for the service will probably not happen until the market matures.[23]

Of course, the final solution could be a mixture of all three: customers paying a minimal fee, automakers subsidizing some of the costs and third parties paying the balance.[23]

Another viewpoint is that the quickest way to drive the cost down would be a move for legislation. For example, if there was a federal government initiative designed to enhance public safety by making emergency and accident avoidance services available to every driver, then the increase in volume would drop the per-unit cost.[23]

XII. Future Outlook

The future of the automobile may move from a basic form of transportation to include all things home, office and in between. Cars may become a future hub of information – handling everything from important e-mail and news, to making reservations and obtaining directions. Everything that can be done at home or office could now be done in your vehicle.

Automotive telematics systems are used for a number of purposes, including collecting highway tolls, managing road usage through the U.S. Department of Transportation, Intelligent Transportation System, tracking fleet vehicle locations, recovering stolen vehicles, providing automatic collision notification, and providing location-based driver information services. In addition, a telematics system could have the capability to provide remote diagnostics, whereby the vehicle's built-in systems would identify a mechanical or electronic problem and that information would be relayed to the vehicle manufacturer. As an added bonus for consumers, audio and audio-visual entertainment packages could be added to the system.[4]

There is also the option of integrating GPS functionality into mobile devices – PNDs, PDAs and cell phones – instead of embedded in the vehicle itself. The major obstacle to this is the ability of the GPS to operate inside the automobile without an external GPS or cellular antenna. GPS antennas must have an unrestricted view of the sky to track satellites. This would be attractive from a cost and convenience perspective, but it would not support the stolen vehicle alarm, door lock/unlock and other features that require the device to remain in the vehicle when the occupants have left.[7]

Telematics systems once relied only on satellites to communicate, but now providers are piggybacking on digital cellular signals through agreements with providers such as Sprint and Verizon, making communicating more cost-effective. This will help the telematics market to reach the "critical mass," which will make a major difference in the automotive aftermarket.[25]

XIII. Interest from Other Industry Segments

The largest automotive telematics market segment is the telematics systems that are installed by OEMs. Currently, the aftermarket telematics market is much smaller. Many of the aftermarket devices are bought for other uses and are later connected to the automobile to create limited-function telematics systems. Mobile phone integration systems are becoming popular and are expected to remain the most important telematics application.

But this data is also valuable to numerous segments of the automotive support industries. Insurance companies can benefit from usage data to lower their claims and fraud exposure, and they could offer lower rates to customers who are willing to share usage data. For example, GMAC Insurance with help from OnStar will offer discounts on premiums to drivers who don't put a lot of miles on their vehicles. The General Motors

(GM) subsidiaries are giving low-mileage motorists an opportunity to save money if they permit GMAC Insurance to track their odometer readings through the OnStar telematics service. Drivers with less than 15,000 miles a year are eligible and could save 13 percent to 54 percent on their premiums. GMAC has been testing the program since 2004 with about 10,000 GM vehicle owners participating. Mileage data will come from the monthly vehicle diagnostic e-mail messages that OnStar sends to subscribers. OnStar states it will provide no other information and does not keep historical data on subscribers' driving practices.[26]

In another example, the United Kingdom's largest insurance company, Norwich Union, is planning to launch a pilot program called "Pay As You Drive" that will use telematics to determine when, where and how often vehicles are driven, and calculate premiums accordingly. The program will equip the vehicles of 5,000 volunteer motorists with telematics devices that will relay each vehicle's status back to the insurance company via the United Kingdom's wireless phone network. IBM is providing the telematics architecture, device specifications and software for the venture.

IBM can accomplish this by designing telematics infrastructures that can be used by different companies. Each company gets its own secure customized functions while, in effect, sharing the costs of the back-end components. In addition to the project in the United Kingdom, IBM is working with the insurance company that covers 80 percent of New York City cabs on a telematics system that will automatically collect and transmit accident data.[23]

The health care industry can save lives and improve its efficiency with additional and more detailed real-time crash data. In a recent press release, the GM Foundation announced a partnership with the Centers for Disease Control and Prevention (CDC) and the CDC Foundation. They plan to develop procedures that will help emergency medical responders determine more quickly if a motorist needs care at a trauma center after a vehicle crash. A panel comprised of emergency medical physicians, trauma surgeons, public safety and vehicle safety experts will review real-time crash data from OnStar's Advanced Automatic Crash Notification (AACN) vehicle telematics system and similar systems from other companies to help improve emergency transport and treatment of crash victims.[27]

In a recent news article, GM and the University of Michigan Medical School are conducting a study that will use crash data from OnStar to develop safer vehicles and help determine the type of injuries commonly found in certain types of accidents, i.e. front or side impacts, or rollovers.[20]

Government organizations also can benefit from automotive telematics data for a variety of uses, such as accident statistics collection, regulatory information, safety recall data and improved road design.

XIV. Analog vs. Digital

When technology is built into a vehicle that is designed to last 10 to 15 years, upgrading to newer technology is not easy.[17] In 2002, the Federal Communications Commission ruled that cell phone service providers would no longer be required to provide analog service after Feb. 18, 2008. Switching from analog to digital allows more phone calls in the same amount of bandwidth.[28]

OnStar may risk losing customers who purchased a GM vehicle before the 2003 model year. Ninety percent of OnStar's 4.5 million subscribers own vehicles that already operate on a digital network or can be retrofitted. Customers with older vehicles can be retrofitted by a 415-equipment upgrade at a dealership.[29]

Dealers will have the option whether to upgrade OnStar equipment from analog to digital in the certified cars and trucks they sell.[30]

XV. Battling the Giant

OnStar, a wholly owned subsidiary of GM, is the leading provider of in-vehicle safety, security and communication services. OnStar became standard on nearly all GM retail vehicles in the United States and Canada by the end of 2007.[27]

Average monthly OnStar responses through June 2007 include:[31]

- 400 stolen vehicle locations.
- 1,000 airbag notifications.
- 380 advanced automatic crash notifications.
- 6,000 Good Samaritan calls.
- 11,400 emergency calls.
- 47,000 remote vehicle diagnostics.
- 27,000 roadside assistance calls.
- 50,000 remote door unlocks.
- 353,000 routing calls.
- 14,000,000 OnStar hands-free calls.

In April 2006, OnStar reported that its most-used feature by motorists was unlocking vehicle doors when keys are accidentally locked inside. In 2005, OnStar received an average 36,000 requests a month for remote door unlocks. According to the list above, that number has grown to 50,000.[25] Consumers can expect OnStar to continue making improvements in enhanced voice recognition and continuous hands-free dialing.

An *Automotive News* article (September 2007) reported that OnStar is introducing two new features to help market and increase subscription renewals. Service Line Videos will provide subscribers access to short videos, which explain the features of OnStar, and a pilot program with MapQuest will allow subscribers to download up to five destinations for immediate or future use.[33]

XVI. Latest News from Ford

Ford Sync – developed with Microsoft – connects people and their portable devices while in the vehicle, including media players and Bluetooth-enabled mobile phones. This new technology is exclusive to Ford, Lincoln and Mercury vehicles. Ford recently announced that Sync would be offered on more products during calendar year 2008, approximately 85 percent retail volume. Sync is on track to reach 1 million sales in early 2009.[34]

Ford also announced that it will lead in-vehicle connectivity further with the launch of the next-generation navigation system available for the first time with SIRIUS Travel Link, a suite of data services broadcast through SIRIUS's existing satellite and repeater infrastructure. SIRIUS Travel Link includes traffic data, weather, fuel prices, sports and movies.[34]

When the airbag deploys in your new Ford, the car automatically dials emergency services. OnStar-equipped GM cars have been doing that for a decade. Ford currently does it for free if you've got the new Sync Bluetooth-and-music adapter, rather than for a monthly subscription. Sync is available free on the top trim levels of a dozen Ford, Lincoln and Mercury models, including the Focus, and for $395 on the mid-trim levels.[35]

XVII. The OEM Perspective

In the 1970s, only 9 percent of a vehicle value was based on electronics, according to a report from the *Detroit News*. By 2010, the report says, vehicle electronics will total 40 percent of total cost, and that number is expected to double in just three years.[25]

Looking at that prediction, OEMs may have a new perspective on their telematics strategy model. Other types of telematics content may possibly involve the aggregation of "data from" the vehicle in addition to "content to" the vehicle.

At some point, OEMs may subsidize the cost of installing telematics control units in a vehicle for purposes of obtaining valuable data from the vehicles. This provides a platform for basic services that can be used to add additional telematics functionality. Perhaps safety and security will be bundled with the vehicle in exchange for allowing data to be periodically transmitted back to OEMs.[9]

Although the total dealership network may be too small to handle the total number of potential customers, OEMs have the capability to use telematics to potentially bring more customers to the dealership or dealer satellite service facilities. This scenario could redirect the amount of repair work and routine maintenance that has predominantly gone to the independent sector of the industry.[36]

XVIII. The Independent Repairer Perspective

The independent repairer may perceive telematics as a threat, as the automobile manufacturers are able to drive motorists into their service bays for repair and

maintenance. But on the positive side, some surveys indicate that most consumers prefer dealing with independent shops more than with dealerships.[36] The May 2008 issue of *Consumer Reports* contains an article in line with these findings.

This form of direct communication by the manufacturer could include a simple reminder that maintenance needs to be performed or it could alert the driver of a diagnostic code indicating that the vehicle is not functioning properly. Shortly following, a diagnosis would be given and the driver may either download a "fix" or be routed for service.

In the December 2007 issue of *Counterman* magazine, telematics was listed as the No. 1 issue facing the automotive aftermarket and appears to enforce the impact on the consumer's choice of where to take their vehicle for service or repair.[37]

However, there are plenty of opportunities for the aftermarket. OEMs are positioned to hold a captive market with their proprietary systems, but their prolonged research and development periods could work against them in the face of rapidly changing technology.

But whether telematics will mean that dealerships or dealer satellite service facilities will replace independents will depend on many factors. First, the number of subscribers to telematics-equipped vehicles must significantly increase before any effect can be accurately measured. Second, the aftermarket and automotive service and repair shops will have to be open to new technology. The proper equipment and training will be essential to sustaining a successful business.[38]

XIX. The Other Arguments

There are others out there who do not believe automotive telematics will become an important technology. Opponents reason that the players in the telematics arena want to implement their vision now, but in reality, they must realize that the consumer may not be ready for the full capabilities of telematics. To launch before consumers are ready would be devastating to providers.

Three arguments against telematics are:

1. **Cost factor** for building the necessary infrastructure. At this time, no mass market is about to open. The market is not ready to commit dollars for the infrastructure and call-center costs necessary to support a centralized safety and security network.
2. **Consumer demand** is low. Telematics has had a tepid reception by consumers.
3. **Telematics providers** must create a perceived and tangible value to make the initial sell to the consumer and then continued justification to retain. To underscore a previous statement – for telematics to be a success, it needs a core application that is used regularly.

XX. Projections

There are two interesting projections. The first is that telematics services will be available from a variety of service providers and the automotive manufacturers will only control a small portion of the total telematics service market. There will also be significant overlap between services delivered to telematics systems and services delivered to mobile devices.

Second, the long-term outlook for telematics services and content providers looks promising because the installed base of telematics-enabled vehicles will continue to grow and is projected to exceed 100 million by the end of the decade. Also the increase of smart phones and PDAs in the United States is beginning to provide the infrastructure needed to make telematics work on a large, profitable scale.[9]

XXI. Summation

The OEMs took an early lead with telematics but have experienced disappointment in customer acceptance. The aftermarket has an opportunity to take advantage of this situation by meeting or exceeding the level of services offered by OEMs. Even though the OEMs control access to the vehicle data bus and the user interface, the aftermarket will continue to explore opportunities to enter this market.

The average consumer finds value with the additional safety and security for themselves and their families when in their vehicle. These features can persuade the consumer to subscribe initially, but may not keep the majority of them. To get that loyal customer, other conveniences will need to be available, such as entertainment, real-time traffic information, weather, news, diagnostics and maintenance reminders. Another "must" for the consumer is to be able to use his/her wireless device, i.e. PDA or headset, to connect with the vehicle. Cellular technology continues to be the primary source for telematics, but satellite radio and Bluetooth technologies are being explored.

Cost continues to be a deterrent, as the high cost for services and hardware discourages many consumers. They find it difficult to justify paying for something that they hope they will never have to use.

Lower costs and providing more attractive applications may increase consumer participation. OEM-equipped hardware available in all makes and models could also boost the telematics market.

With telematics, the OEMs could stay in touch with their customers and gather performance data that could help build better vehicles. In April 2006, OnStar reported that more than one million GM vehicle owners signed up for OnStar Vehicle Diagnostics. Customers reported that the monthly OnStar e-mail provides them significant value and saves them time and money by helping to eliminate unnecessary repairs and maintenance. The e-mail is also available in Spanish.[39]

XXII. Conclusion

Industry experts see a definite need and a place for the aftermarket in the telematics segments, especially as hardware and services become more cost-effective and new products demand quicker product development cycles, something the OEMs often can't accommodate.

The independent repair sector is keenly aware that remote diagnostic capabilities may keep motorist captive to the automaker for maintenance and repair.

It appears that telematics will have an impact on the independent automotive service and repair industry. However, it's hard to predict how large an impact. Currently, enough data exists to support the fact that the dealerships will not be able to service every vehicle on the road. But, a reality is that OEMs will continue to produce vehicles with telematics capabilities.

The popularity of telematics will continue to depend on the consumer. The OEMs will have to find the right fit at the right price to increase the demand. To ensure that an OEM gets a return on its investment, it appears that telematics must become standard equipment on all vehicles.[40]

Independent repairers have faced many challenges over the years and have survived. Telematics is another hurdle that the independent repairer will have to address. Just like computers, cell phones and the Internet – which were once new technologies – telematics will also become integrated into our daily lives.

Some independent repairers may fear telematics and envision it as a dark cloud over the industry. Others will see it as a light leading to new business opportunities. Every problem has a solution. There will be a solution to telematics that will benefit the independent automotive service and repair professional, as well as the manufacturers and service providers. Facing the challenge, accepting it and educating yourself about telematics will move the independent automotive repairer forward. The automotive service and repair industry can adapt to this technology.

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