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Backgrounder

Intel Technology Enables Connectivity on the Road and Beyond

Technology is evolving so rapidly that it has become an integral component of people's lives. So much so that having uninterrupted access to e-mail and instant messaging, as well as to the constant flow of news, entertainment and social media, has become the norm. This level of connectivity is possible at home and in the office, and is now extending to life on the road.

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On the Road

Today we see the benefits of in-vehicle infotainment (IVI) systems that offer Internet connectivity in the car, providing features such as live traffic updates, which notify you of any slowing traffic ahead and enable you to re-route your trip if needed. GPS devices and in-vehicle navigation applications have eliminated the need for cumbersome maps or printing directions before you leave. Intelligent applications on smartphones also help you identify nearby restaurants and other roadside attractions.

In the near future, Intel foresees highly integrated intelligent transportation systems that communicate with vehicles and the transportation infrastructure, making travel safer, greener and more convenient. For example, researchers are working on cars that will capture information about vehicle speed, steering and braking along with video footage from inside and outside the vehicle. Camera systems will be able to recognize street signs and alert the driver to changing conditions. Vehicles will also be able to communicate wirelessly with each other and the traffic infrastructure so they can notify drivers of changes in traffic patterns and of potential road hazards.

Within the vehicle, next-generation IVI systems powered by Intel® Atom™ processors will be able to push e-mails from a smart phone to the car's multimedia screen and read them aloud to the driver, or seamlessly transfer video content from the home TV to the car for passenger entertainment. Consumers can expect to see in-car applications including voice-controlled instant messaging or social networking and efficient "to-do" lists that track progress.

Alliances and Partnerships

The GENIVI Alliance is a group committed to driving the broad adoption of an in-vehicle infotainment (IVI) platform. Founded in 2009 by BMW*, Intel, General Motors* and others, the alliance has adopted the MeeGo* platform as the basis of its next IVI system. Progress in research and development means that we will soon see faster integration of multimedia, navigation and Internet in cars, with future integration of tablets, smartphones and netbooks.

Systems on the Road

Recently, two production cars hit the streets in China with IVI systems powered by Intel Atom processors and running the MeeGo operating system. HawTai's B11* sedan and the Geely* EC825 car deliver a connected experience for drivers and passengers, including

navigation, entertainment and Internet services and applications. Real-time traffic maps, online gaming, remote diagnostics and notifications when a service is due**,** are just some of the features available to drivers in China. Meanwhile, Intel is also working closely with Shenzhen Hazens Automotive Electronics Co., Ltd.* (Hazens) to accelerate IVI system development and bring enhanced in-vehicle experiences to the marketplace.

Intel and Huizhou Foryou General Electronics also recently signed a strategic cooperation agreement in China, created to enable the joint development of next generation IVI systems based on the Intel Atom processor. These systems will feature applications such as voice control, real-time 3-D GPS navigation and Internet access as well as support for concurrent applications on multiple screens.

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In the Air
As the number of airline passengers increases, Intel is working with airline industry suppliers to develop products that offer an improved in-flight experience. This includes in-flight entertainment systems, based on the Intel Atom processor, that are capable of showing a large selection of movies, TV programs, music and games to enjoy instantly from the seat.

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On the Track
The U.S. has more than 1.3 million railcars in service, according to the Association of American Railroads. Keeping them rolling is a significant undertaking with wireless technology playing a vital role.

Most rail monitoring systems are based on radio frequency identification technology (RFID), used for identifying trains and rail cars as they roll past a fixed point. While RFID enables systems to identify a passing rail car, the systems were not designed to monitor in real-time the location of each rail car. More importantly, potential faults that may cause a rail car to break down cannot be detected until its next scheduled service, which can be a few weeks to a few months away This is where wireless sensor technology can potentially deliver greater speed and reliability by transmitting information for preventive maintenance, as well as monitoring the integrity of perishable and environmentally sensitive cargo.

Running on the Intel Atom processor, networked sensors mounted on rail cars can monitor the vibration patterns and temperature of its wheel bearings. The condition of a wheel bearing is one of the key determinants of the speed at which trains can be operated. When wear and tear reaches a certain threshold, preventative servicing notifications can be sent in real-time to maintenance and engineering teams. This technology aims to reduce the incidence of wheel bearing failure, one of the leading causes of train derailments. Tiny wireless sensors can operate on as little as 20 milliamps of electrical current, so they can be self-powered from the vibration of the rail car in transit using a process known as parasitic power harvesting.

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Intel technology is being embedded in a variety of transportation solutions and is already transforming the ways in which people interact with each other. Intelligence throughout the transportation network that is secure and reliable is key to transforming the infrastructure into a proactive, connected system that improves travel in every way. For more information, visit the Intel embedded press kit: www.intel.com/newsroom/embedded

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