



High Speed Mobility

High speed trains tend to lose out in the US due to the country's love-affair with automobiles and airplanes, along with limited government support. But across Europe, high speed trains play a major role in rapid travel, particularly for people moving between cities within individual countries.

In 2007, new high speed lines opened or were nearing completion in four European countries, while the Eurostar high speed line that links Britain to the Continent carried a record 8.26 million passengers. In addition, seven rail operators formed a new alliance called Railteam to promote pan-European travel via high-speed trains. Their goal is to make high speed train travel across borders as quick and easy as it is within one country. France's SNCF rail system chief executive Guillaume Pépy predicts that within 15 years it will be possible to travel by high speed train all the way from Paris to Bratislava, Slovakia.

While high speed train travel races across Europe, German rail operator Deutsche Bahn AG and four mobile network operators—T-Mobile, Vodafone, the E-Plus Group, and O2—have chosen Andrew to ensure reliable wireless communications for passengers on its high speed trains in Germany. Andrew was recently granted a multi-year communications systems upgrade contract for the installation of in-train repeaters on Deutsche Bahn's ICE trains. Focused primar-

ily in Germany, ICE connects all the major German cities such as Frankfurt and Hamburg in just under 3.5 hours. It services over 32 destinations with train speeds of up to 280 kilometers per hour and hourly service.

"High speed rail is one of the most challenging environments in which to provide wireless communications, with the complexities of different terrain and rapidly changing outdoor signal levels of the various networks," said Matt Melester, vice president and general manager, Wireless Innovations, Andrew. "Even though high speed trains decrease travel time, passengers still want phone calls that won't be dropped and to access the Internet and email."



An installed in-train repeater

High speed rail is uniquely challenging for wireless operators due in part to the trains' metalized windows, which can dramatically reduce signal penetration into the carriages, resulting in spotty coverage and an increase of dropped calls. In addition,



Metalized windows, along with high train speeds making call hand-offs more challenging, impact coverage inside trains.

the pure speed of a train's travel can complicate the "hand off" of signals, especially in sparsely populated areas lacking in network facilities. To improve the reliability of wireless signals on trains, wireless operators can install or move base stations closer to the tracks, a move that requires a sizeable investment. As a more cost-effective method, operators can install repeaters on the train, which amplify signals received from networks in the vicinity. Andrew's repeaters provide superior quality onboard, resulting in clear and reliable mobile telephony up and down the ICE tracks.

"These days, people in developed wireless markets expect good coverage wherever they are, even on high speed trains," said Melester. "Andrew's in-train repeaters are a versatile, cost-effective means for ensuring that happens."

Andrew in-train repeaters will be installed in all 250 ICE train sets covering nearly 1,500 carriages—the majority of the ICE fleet—by 2010. They support five separate GSM networks in the GSM-900, GSM-1800, and GSM-R bands, covering the four operators' plus the rail system's communications networks. As the world's leading manufacturer of repeater systems for mobile communication networks, Andrew has years of experience and expertise in radio planning, project management and system engineering. Major coverage projects have included the 2006 World Cup Stadiums; the major venues used during the 2000 Sydney Olympic Games; the tallest building in the world—Building 101 in Taipei, Taiwan; metro rails in Beijing, Hong Kong, Moscow and Montreal; and numerous international airports.

¹ Matlack, Carol. "High-Speed Trains Erode Europe's Borders," Spiegel Online, January 10, 2008. <http://www.spiegel.de/international/business/0,1518,527794,00.html> (accessed June 10, 2008).