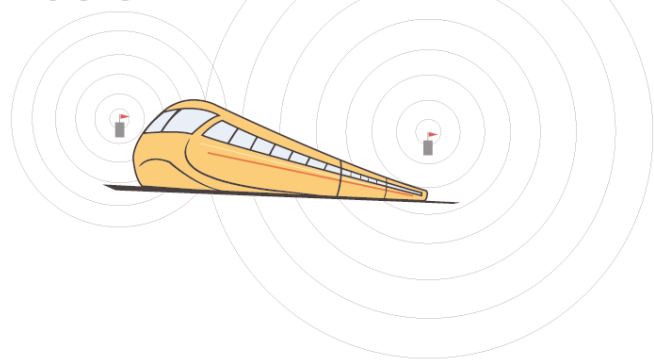




## Case Study - Broadband on Tracks

*High-bandwidth, superior reliability and blazing speed characterize mobile solution for train commuters in UK, enabled by Redline's AN-50e broadband wireless platforms*



### Key features of the AN-50e:

- High upstream and downstream data rate performance
- Very low packet latency
- Signal unaffected by rain, snow or clouds, unlike satellite alternatives
- Seamless and rapid signal hand-off among base stations that line the railway track, regardless of 160 km/hr. train speed
- Robust radio connections that maintain integrity through typical, high-density urban structures
- Base station and onboard platforms, featuring Redline's OFDM-based technology, is unobtrusive, unlike alternatives requiring large antennas and track-side towers

There are few 'moving targets' faster than the locomotives and coaches on Southern Trains' London to Brighton (UK) route, with the 90-kilometre journey taking less than an hour to complete at 160 km/hr. But for many business commuters, it's a wasted hour, for although they often have cell phones and Personal Digital Assistants (PDA), these gadgets and their network services are relatively slow and unreliable for real-time data exchanges with colleagues and for accessing information stored on email servers, virtual private networks (VPN) and the Internet itself.

Eager to provide an additional - and some would say 'mission critical' service - to its business clients, Southern Trains considered the options for delivering wireless data connectivity in the volumes, speeds and with the reliability that its clients had come to expect from their fixed, corporate networks.

### Intrusive Towers not an Option

First and foremost to spring to mind was to beam the data in via satellite. But there were few working examples to draw on. And even those moderately-successful examples illustrated the problems inherent with satellite delivery. They included the need for a great deal of expensive, additional hardware to be added to both the train and along the route, to receive and amplify the satellite signals. And then there was the problem of poor performance and lost signal, occasioned by frequent and unavoidable events - such as poor weather, or going through a tunnel. Delivering exclusively via GSM/GPRS technology was considered, but the very low data transfer rates were even more problematic than those posed by satellite delivery.

To be successful, a two-pronged approach was needed. On the receiving end, services - such as password authentication and security - were required as well as WiFi-capable laptops and PDA devices. On the delivery side, a reliable, high-speed and high-volume, broadband network link was necessary to flood the WiFi-enabled devices with bi-directional wireless signals.



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### Benefits of Redline Solution:

- Seamless switching between high-speed, track-side data networks and mobile networking technologies while leveraging state-of-the-art data compression and recovery protocols
- Dynamics of network operations easily configured and monitored in real-time
- High speed upstream service for clients sending large files or transmitting on-board video surveillance
- High speed download service also possible for bandwidth-intensive applications, such as streaming video through typical, high-density urban structures

### Future Train and Transit Uses:

- Video surveillance of coach interiors, and the tracks ahead, for improved passenger safety and security
- Delivery of multi-media entertainment channels using streaming audio/video
- In-carriage informational services such as mapping services



*Capable of passing data at rates approaching 49 megabits per second (Mbps), the AN-50e lies at the heart of the system that now enables commuters to work with email and access their corporate VPNs, as well as surf the Net, without interruption.*

### High Quality of Service Achieved

Southern Trains teamed with two key suppliers: T-Mobile, whose extensive network, large client base and familiarity with WiFi technology made it a natural, and Nomad Digital, a seasoned provider of wireless connectivity and roaming services. For its part, Nomad Digital designed a simple yet elegant solution consisting of subscriber stations within the trains and base stations positioned along the route to provide consistent, seamless data delivery. But who to supply those mission-critical broadband network relays?

For the deployment, Nomad Digital chose Redline Communications, which in turn installed its AN-50e wireless broadband delivery platforms for both the subscriber and base stations. Capable of passing data at rates approaching 49 megabits per second (Mbps), the AN-50e lies at the heart of the system that now enables commuters to work with email and access their corporate VPNs, as well as surf the Net, without interruption.

“Finding a solution that could deliver secure high-speed access in a mobile application, with sufficiently low latency and rapid registration as the train enters each sector, was a huge barrier” says Nigel Wallbridge, Nomad Digital Executive Chairman. “ But the Redline technology came through with flying colors, providing the reliability, bandwidth and speed needed for the project – even when the train traveled through tunnels. It also has excellent receive sensitivities, which is important in areas where there are tighter power restrictions.”

The system is expected to be expanded to other routes following the initial trial period.



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