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INTELLIGENT TRANSPORT SYSTEMS



Ensuring Resilience and Reach through Satellite

Satellites have been delivering fixed and mobile communications services across the globe, its seas and its skies for over 60 years. From simple beginnings they are now key enablers of secure and mobile communications for safety, border control, security, defense, welfare, data communications and entertainment for passengers on every world continent.

An increasing number of people, using an increasing number of connections and applications presents challenges in terms of coverage, capacity, and bandwidth. With that population constantly on the move, expecting seamless connectivity from the air to the ground, satellite and terrestrial networks must be integrated. Specifically, next generation hybrid mobile/satellite connectivity will underpin the world's future connected transportation infrastructure.

Broadband connectivity via a combination of mobile and satellite is key to enabling full exploitation of the next generation of mobility services for transport - including intelligent cars/smart roads, trains, ships or planes - both manned and unmanned.

Mobility as an economic Driver

Movement within a nation's borders, across borders and around the world is critical to a nation's prosperity. Anticipated revenue for the road sector alone is around \$33bn worldwide per annum by 2020, with the transport industry becoming increasingly reliant on technology and communications including infrastructure, communication systems, in vehicle systems, service sector and personal devices and applications.

Two main features characterise Intelligent Transport Systems for road transport:

- ▶ The move towards automation often cited as the driverless car
- ▶ The need to communicate everywhere – between vehicles (V2V) and with infrastructure (V2X)

Before we see a mass market of driverless cars, we will see a range of semi and autonomous systems and services such as self-parking cars, automated braking systems and similar systems. Present-day systems will become more complex to include collision avoidance systems; safety critical systems; platooning and other real-time information-sharing systems. These systems need to be and will be expected to be **available everywhere** and able to communicate seamlessly across different platforms.

Current terrestrial communications provide significant coverage by population but have significant gaps in coverage, availability and/or bandwidth.

Safety, business & security markets: drivers of innovative communications solutions for roads

Equipping roads with additional communications infrastructure was always assumed to be the way forward but the associated cost and current economic climate worldwide has made this route unlikely for most countries.

The need however remains and is driven not only by safety but also by (I) the **business** market meaning logistics, navigation and fleet management where as traffic increases, pressure to deliver just on time also increases and (II) the **security** market where with increased pressure from criminal activity, more advanced tracking and vehicle immobilisation systems are close to being introduced, requiring resilient communications less impacted by handheld interference devices.

Both markets have already shown a growing interest for affordable satellite communication services, for both limited and bulk data to ensure businesses operating across the country can stay connected.

Terrestrial networks are constrained in terms of reach and the type of content they can deliver.

Alternative network connections such as satellite enable delivery of safety, business and security services everywhere.



Connecting tomorrow's vehicles

Future vehicle communication platforms should include state-of-the-art mobile and satellite communications for long-range connectivity, in addition to short range capabilities such as WiFi and Bluetooth, with the ability to switch between communications bearers to keep the user connected for as long as possible. Such hybrid routers are being developed as intelligent and rules-based systems to ensure the cheapest and most effective communication method is used, where data will only be sent when needed and within thresholds defined by any given user.

Early adopters will be emergency services and the safety and logistics markets, where there are clear business needs and where the market will stand slightly higher hardware costs. Furthermore the GPS and Galileo satellite constellations provide critical navigation capabilities common to all Intelligent Transport Systems that will continue to evolve to deliver more sophisticated services.

Satellite operators are already working with car and antenna manufacturers to develop new affordable business models to encourage and nurture the early uptake of systems and to move from a small to large user community.