

## Fiber Optics for Intelligent Traffic Systems

Intelligent Traffic Systems (also referred to as Intelligent Transport Systems) involve advanced control of the traffic via real time data input and interactive communication with the drivers to make the best and most efficient use of transport systems. Transportation in big cities like Tokyo, London, Paris, New York, and many more around the world has been an issue for more than a decade now. With a gigantic number of automobiles as the primary source of mobility, traffic jams are inevitable. On narrower pathways, high load can cause very slow moving traffic or for extreme cases, static traffic.

In order to deal with these traffic issues and provide drivers with the best experience, smart systems have been designed. These systems have been deployed worldwide, particularly on congested highways and high load city streets. ITS offer traffic control centres with real time data and statistics of the traffic and load which may include high quality video surveillance. They also interact with the drivers, supplying them with valuable information and guiding them towards routes with minimum traffic load in order to smoothen the journey. At rush hour times, few elite systems also demonstrate the extra lane in order to increase traffic rate and reduce the load.

Intelligent traffic systems can also guide drivers under low visibility conditions such as foggy weather. In some of the deployed ITS, the roads 'light up' to show the path and avoid mishaps. To eliminate the time wasted at toll stations, ITS systems also offer pay as you go services at many toll stations. Here a special sticker or device on the car is read which identifies the passing vehicle and the toll fee is automatically billed online. Similarly, drivers who may violate traffic rules can also be identified using a feature that snaps the car photo particularly focusing on driver and the license plate in case of a traffic violation such as breaking the red light.

All these functions and features of smart traffic systems depend on continuous and heavy exchange of data between control centre and the roads. Copper wires and other old technologies were unable to provide efficient and feasible communication over large distances. Any delays in communications could be highly damaging particularly on roads where traffic flow is very fast. Fibre optics emerged as a favourable solution and single mode or multimode fiber optic cables have been used widely to support the large amount of communication needed by intelligent transportation systems. Single mode optical fiber offers very low attenuation over large distances along with high bandwidth, reliability, security, and unmatched speed.