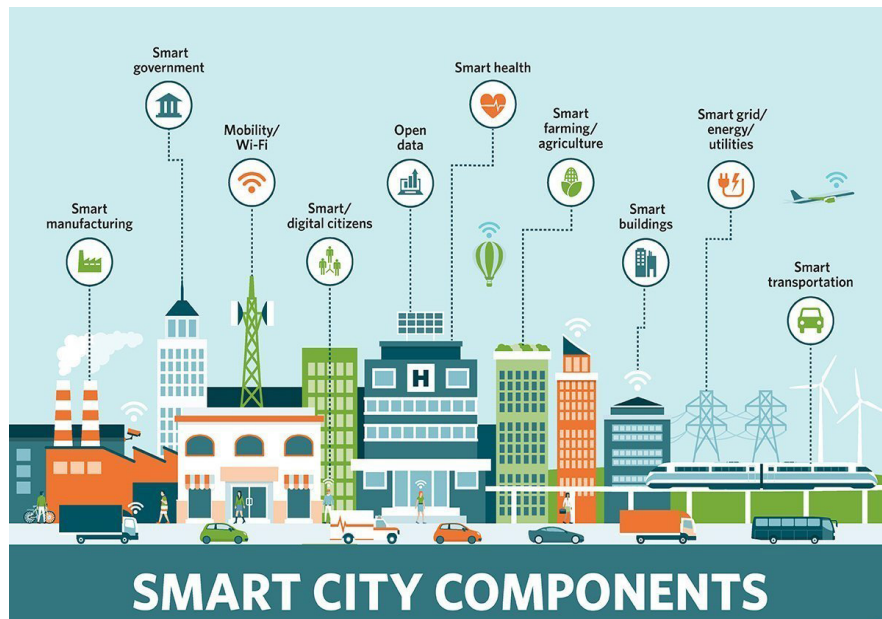


The Role of Fibre Optic Cables in **Smart Cities**

Smart Cities represent the evolution of the traditional city concept thanks to the use and extensive application of the information and communication technologies to their usual operating processes. In general terms, implementing a smart city is an operation based on implementing a stack of superimposed layers, each one of which has a specific function, and at the basis we have the **intelligent infrastructures**, fitted with specific sensors which are intended to collect as much analysable data as possible (big data).



Aston positions itself as a solution supplier for the base of the stack, focused on different photonic technologies which use **fibre optic cables as distributed sensors**. The ubiquity of fibre optics in all cities as a basic element in the data transport network, also means this can be used to directly and immediately layout the sensoring systems or, at least, get close to the area that is to be monitored, and this can then be extended using the fibre optic sensor cables by Aston.

In this case, the Aston fibre optic cables make it possible to implement applications aimed at improving energy efficiency, controlling, monitoring and improving mobility, increasing citizen security and protecting assets (surveillance, fire detection in tunnels), to **monitoring the structural health** of strategic elements (roads, bridges, underground railways, unique buildings, infrastructures for transporting water, energy and telecommunications), to controlling and reducing pollution and waste (detecting CO2 levels, pollution in water channels, weights of containers), etc.

There are several competitive **advantages to using fibre optics** as a sensor element in a smart city environment:

- The fibre optic cable is **totally insensitive to electromagnetic interference**, therefore, it is free of radioelectric noise and is totally harmless to its environment.
- It **behaves like thousands of virtual sensors** in a completely passive way (temperature, deformation, vibrations, pressure, etc).
- They are distributed throughout the **sensor cable** layout, spaced equidistantly every few metres, whereby the density of the sensors can increase exponentially and their extension only depends on the scope of the fibre optic layout.
- The operating maintenance costs (**OPEX**) of the fibre optic sensors are significantly lower because these sensors do not consume electricity, do not require spare parts or recalibrating and, virtually, experience no fatigue or breakdowns.