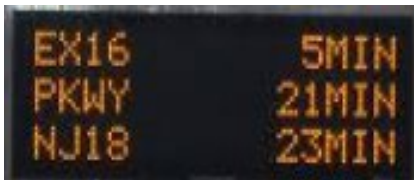


Overview

What are intelligent roadways, and how do they impact our lives? As we look to the future, the implementation of Intelligent Transport Systems (ITS) will become more and more prevalent. Traffic cameras, Google Maps, weather data, and individual cars on the road are just a few of the many inputs that go into creating ITS. Through these inputs, ITS can display relevant information to drivers in real time to best facilitate the flow of traffic, help develop improved mapping systems, and provide data points for Department of Transportation goals.



Why are they useful?

Intelligent roadways contribute to increased traffic efficiency and safety. ITS can assist in lowering traffic fatalities and injuries by identifying obstacles for pedestrians and drivers. Saving time on travel or transportation is particularly important because reducing our emissions of pollutants has become a more pressing issue. When disseminating information, ITS can alleviate congestion, mitigate the impact of accidents, and boost economic activity on our roads and highways, which is vital to our country's success.

Implementation

Transportation infrastructure has evolved because of the development of ITS. At the core of this are systems and various state-of-the-art technologies that work in harmony to gather real-time data, optimize traffic flows, enhance safety, and pave the way for autonomous vehicles. Below is a closer look at the various forms of equipment being utilized in ITS.

Sensors

One of the backbones of the intelligent roadways are the extensive networks of sensors strategically deployed along roadways. These sensors, which can include radar, lidar or light detection ranging, and ultrasonic devices, continuously monitor traffic patterns, vehicle speed, and road conditions. Having accurate and diverse data is paramount for proactive traffic management.



Communication Systems

For seamless connectivity between all sensors, systems, and cars, intelligent highways depend on reliable communication systems like cellular networks and dedicated short-range communication (DSRC). The interchange of vital information, such as roadwork alerts, traffic updates, and emergency notifications, is made possible by these communication systems, which improve situational awareness for both automated cars and drivers.



Adaptive Lighting and Smart Signage

Intelligent roadways feature adaptive lighting systems that adjust brightness levels based on environmental conditions and traffic density, enhancing visibility and energy efficiency. Furthermore, smart signage is equipped with dynamic displays and variable messaging capabilities, providing real-time information to drivers, including lane closures, detours, and upcoming hazards.

Renewable Energy Integration

Intelligent roads can incorporate solar panels and other renewable energy sources into their infrastructure to further promote sustainability. These panels can be attached to sensors and even integrate into noise barriers, reducing the reliance on traditional grid-based energy sources and minimizing the environmental impact of roadway operations.



Conclusion

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