

Smart Transportation

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Abstract: - Over the past decade, Intelligent Transportation Systems (ITS) are developed and deployed in order to improve transportation safety and mobility, minimizes environmental impact, promotes sustainable transportation development and enhances productivity. ITS combines high technology and advances in information systems, communication, sensors, controllers and advanced mathematical methods with the conventional world of transportation infrastructure.

Keywords: Applications of IoT, transportation, ITS, electronic toll, security.

I. INTRODUCTION

The Internet of Things (IoT) is basically transforming the transportation industry. Next generation intelligent transportation systems will optimize the movement of people and goods, boosts economics, public safety, and the environment. Smart transportation systems will automate our roadways, railways, and airways, transform passenger experiences, and reshape the way freight and merchandise are tracked and delivered, creating considerable business opportunities for system integrators, independent software vendors (ISVs), service providers, and other solution providers. Intelligent transportation system opportunities abound across a wide range of industries and market segments. Examples include [1]

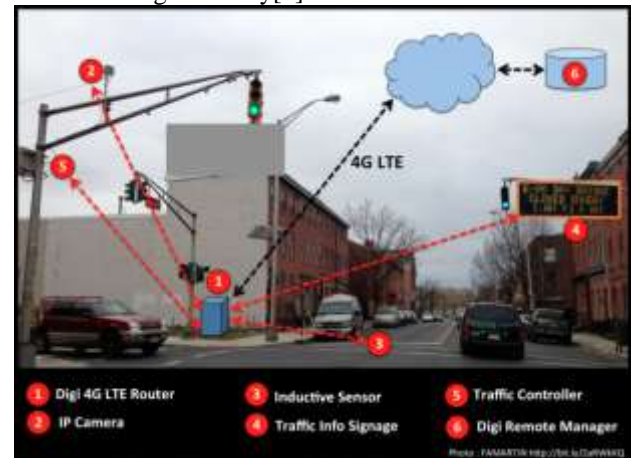
- [] Traffic control system.
- [] Smart fuels and better emission standards.
- [] Guidance and control systems.
- [] Smart vehicle parking assistance.
- [] Electronic toll collecting system.
- [] Peer-to-peer services like car sharing.
- [] Security and surveillance systems.
- [] Railways.



1. Traffic safety and control system

a. Traffic control system

Existing centralised traffic control systems go some way toward alleviating traffic congestion and ensuring the smooth flow of vehicles through a road network. Intelligent transportation system, however, allow traffic lights to respond to changing patterns themselves. Adaptive traffic light systems create smart intersections that control traffic in response to the patterns they observe among the vehicles using them. They can also prioritise specific forms of traffic, such as emergency vehicles or public transit. Large numbers of adaptive intersections working together produce a system in which lights change in response to traffic patterns rather than on a fixed schedule, reducing weight times and keeping traffic moving smoothly [2].



b. Improving traffic safety

Unsafe speeds, dangerous weather conditions and heavy traffic can all lead to accidents and the loss of life;

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intelligent transportation systems help with all of these. Real-time weather monitoring systems collect information on visibility, wind speed, rainfall, road conditions and more, allowing traffic controllers up-to-the-minute information on driving conditions. In fully networked systems, this information can then be used to update warning signs and even speed limits as soon as the need arises, keeping drivers alert to the conditions around them. Emergency vehicles can respond quickly to accidents as real-time traffic monitoring alerts them. ITS traffic control helps divert traffic away from busy or dangerous areas, preventing traffic jams but also reducing the risk of collisions[2].



2. Electronic toll collecting system

Electronic toll collection systems are RFID (Radio Frequency Identification) based systems that read from a distance and automatically deduct the toll at each entry. This technology saves queue-time and fuel cost at the toll gates. It also results in better traffic management by reducing congestion. In India, Mumbai-Pune Highway has this facility and more such electronic toll collection centers are being installed at Gujarat SEZs. This technology will give a boost to industries manufacturing RFID devices, semiconductor chips, and related IT systems[3].

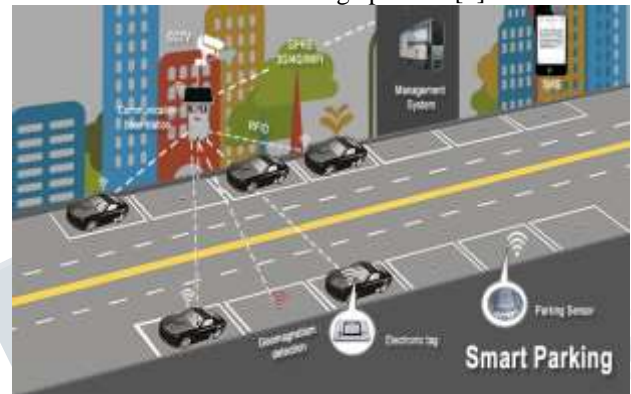


3. Smart vehicle parking assistance

With increase in the population, number of vehicles increases and due to unmanaged parking it leads to many problems. In centre cities, people faces difficulties as

increasing number of vehicles creates congestion, wastage of space, wastage of time, traffic problems, car napping, car vandalism and many other difficulties. This issue can be resolved by smart vehicle parking system which is also an application of IoT.

A smart vehicle parking is a system that helps drivers to find a vacant spot using sensors in each parking space by detecting the presence or absence of a vehicle. Automated parking systems are generally powered by electric motors that move vehicles into a storage position[4].



4. Railways

Control and collision avoidance systems enable automatic braking, senses monitor train speed in real time. Automatic scheduling and re-routing of trains. Senses can track and monitor conductor behaviour. Using IOT for trains helps ensure safety, controls speed and reduces fuel consumption. Rail has employed IOT for a while, though trains operating at high speeds through tunnels and extreme weather conditions has presented challenges when it comes to deploying IOT systems. Fortunately, advances in networking have made smart trains a reality. Great new IOT use cases are possible to further improve operational efficiency, passenger experiences operator's return on investments[5].



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5. Security and surveillance system

For every country security and surveillance has become a key to survival. With rise in terrorism coupled with challenging security conditions, investment in security and surveillance by India is a necessity for survival. In the field of security and surveillance IoT based application can be utilized remotely to see the movement and get warnings when movement is identified. The photographs and recordings are sent straight forward to a cloud server, sent as Gmail Notifications with snapshots and SMS alerts for further action. Accordingly, points of interest such as these make IoT applications perfect for smart security surveillance monitoring wherever security is a big concern. IoT applications are also playing a key role in security equipments which are used for protecting industries, banks, offices, critical installations like Nuclear power stations and other crucial installations.



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II. CONCLUSION

One of the major applications of IoT ease in the transportation. Using IoT we can enhance the security and provide the better means of transport. It is clear that the time and safety, major parameters in transport are improved and also at affordable prices in this paper we have summarized the applications of IoT devices in daily transport[6]

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