

Public Transport and Optimization Using IoT Basics



Edit with WPS Office

1. "IoT in Public Transport":

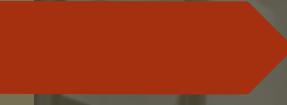
- ☒ Every year, cities get more crowded. Gridlocked traffic and exponential population growth pose challenges for infrastructure, causing wear and tear on roads, air pollution, and parking problems. To accommodate commuters, those that can't afford or choose not to take their cars into downtown or outlying areas, or those heading into areas for one-time events, urban governments look to improve public transit systems. As smart cities continue to evolve, this will become even more critical.
- ☒ Wireless connectivity has been changing the face and structure of public transit systems. From automatic vehicle location (AVL), surveillance cameras, and digital signs to passenger Wi-Fi, busses and trains are becoming more intuitive. From fleet management to rider experience, 4G and 5G coupled with cloud technology can monitor driving behavior, enhance safety, and facilitate the release of instant information between dispatch and vehicles.

A connected vehicle can use cellular routers to communicate helpful and critical information back to the cloud for processing. This is done through intelligent transport systems that use equipment, applications, and other technological approaches to prevent crashes, communicate with maintenance on the vehicle's condition or suggest alternate routes in case of construction or traffic accidents.

Cameras, dispatch terminals, stop announcers, set-top boxes, and more are connected to a router on the vehicle. Information is transmitted via the cloud to the central hub using cellular signals. There, diagnoses and decisions can be made on the fly.



Edit with WPS Office

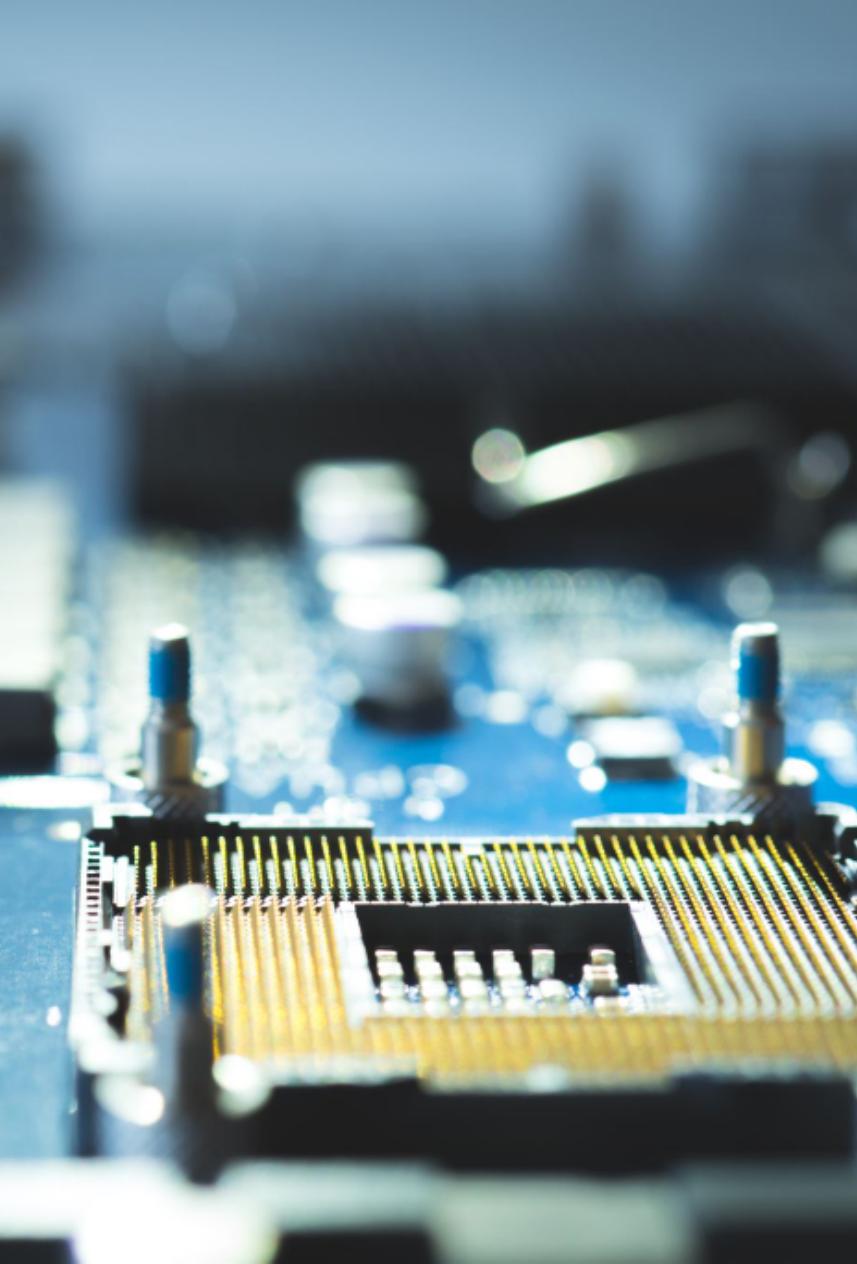


Conclusion

- ☒ LTE and 5G cellular routers used with IoT devices connected to the cloud provide a seamless rider experience and sound business management for fleet owners.
- ☒ As smart cities evolve, public transportation will play a more significant role. Low emission busses and rail systems can reduce energy costs and carbon footprint. Improved routes and seamless service can increase ridership. Cities of the future strive to reduce the number of cars in an area, but that can't happen without a state-of-the-art public transit system.



Edit with WPS Office



2. **Data Collection**:

- ☒ – Sensors can be installed in buses, trains, and stations to collect data on various parameters such as location, speed, occupancy, and temperature.
- ☒ – Data from ticketing systems, traffic cameras, and weather stations can also be integrated into the IoT network.

In recent years, smart public transportation has become one of the most important things for developing cities and improving people's quality of life. Public transportation users face many problems, the most important of which is the long wait at the bus station. The proposed system in this paper will find the nearest buses to a user, the real-time location of buses on the Google map to help passengers track buses in real-time, the arrival time of buses, and speed. T

The system was implemented based on Internet of Things (IoT) technology, by using the Global Positioning System (GPS), a microcontroller with a built-in Haversine formula. It has an error of 8 meters. The arrival time of each bus was calculated based on the distance and average speed of the bus registered along the road. Subject Areas Wireless



Edit with WPS Office



4. "Route Optimization":

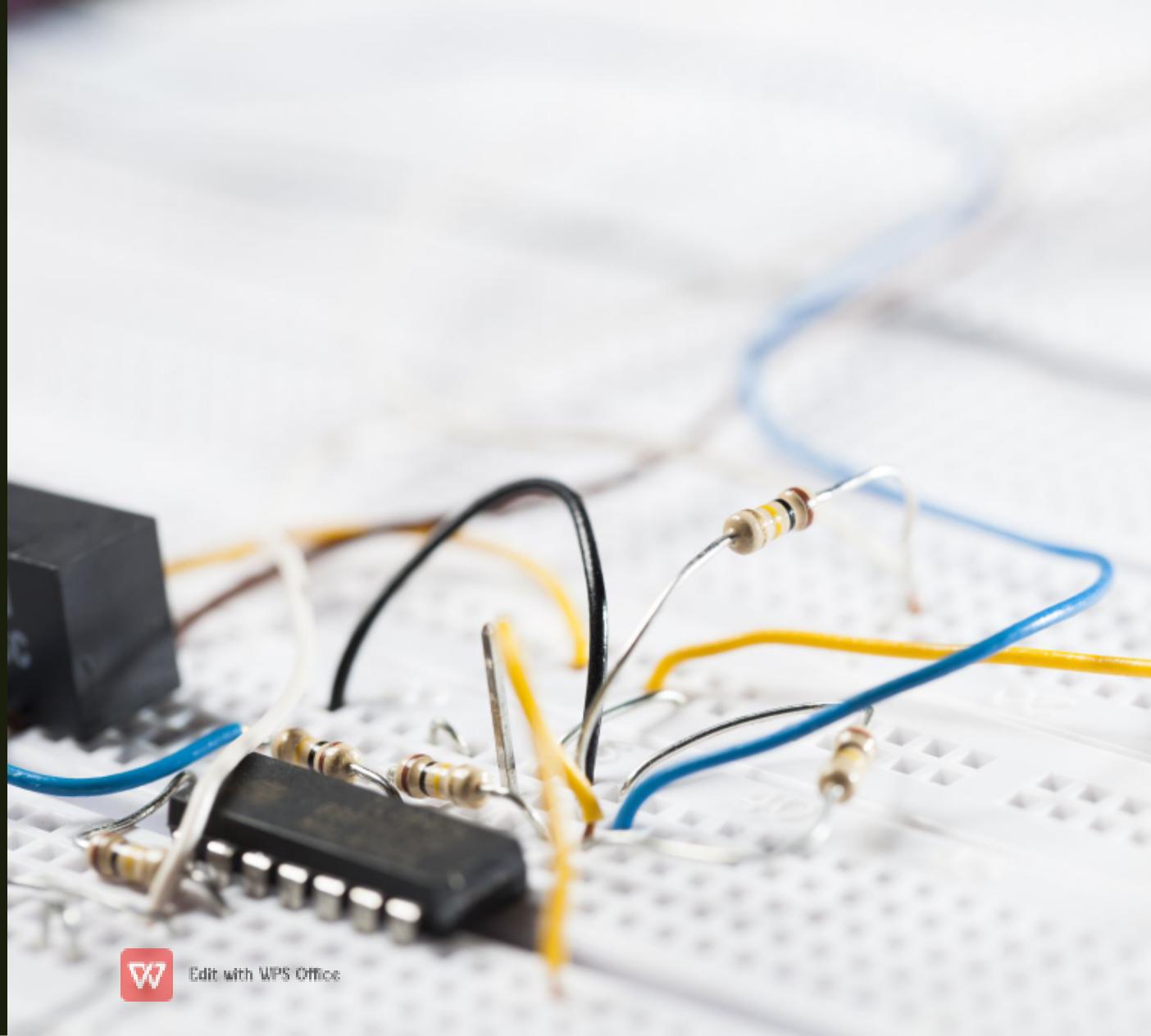
- *By analyzing real-time traffic and passenger data, IoT can optimize routes and schedules. Buses and trains can be dynamically rerouted to avoid congestion or delays.*



Edit with WPS Office

5. **Predictive Maintenance**:

- IoT sensors on vehicles can monitor the condition of critical components and predict when maintenance is required, reducing breakdowns and service disruptions.



6. **Passenger Information**:

☒ Public transit whether it is buses, trains, or ferries can be particularly frustrating for passengers. Although public transit is typically cheaper and greener than traveling by a private vehicle, public transit may not be as comfortable, convenient, or as quick as a private vehicle, passengers will have to plan their schedules around the public transit timetables, and unforeseen circumstances may disrupt public transit operations.



Edit with WPS Office

7. "Energy Efficiency":



- IoT can help optimize energy consumption by adjusting lighting, heating and cooling systems in stations and vehicles based on occupancy and weather conditions.

8. "Safety and Security":

- IoT can enhance safety by monitoring for accidents or unauthorized access in stations and vehicles.
Cameras and sensors can send alerts in case of emergencies.



Edit with MS Office



9. "Fare Collection":

- ☒ – Smart ticketing systems using IoT can enable contactless payments, reducing the time passengers spend at ticket counters and improving the overall user experience.



Edit with WPS Office

10 “Data Analytics”:

☒ *- Data collected through IoT can be analyzed to identify trends, optimize operations, and plan for future infrastructure improvements.*



Edit with WPS Office

11. "Environmental Benefits":



- ☒ Smart cities rely heavily on the Internet of Things (IoT). In 2017, nearly 60% of all installed IoT devices in smart cities were used in smart commercial buildings and transportation. By 2020, smart cities will use 1.39 billion connected things to deliver sustainability and accomplish climate change goals.
- ☒ However, the environment isn't the only beneficiary of this digital transformation. IoT devices can help the public transportation industry reduce costs in significant ways. Consider these four ways IoT is impacting the transportation industry's bottom line:

12. "Challenges":

- Smart cities rely heavily on the Internet of Things (IoT). In 2017, nearly 60% of all installed IoT devices in smart cities were used in smart commercial buildings and transportation. By 2020, smart cities will use 1.39 billion connected things to deliver sustainability and accomplish climate change goals.
- However, the environment isn't the only beneficiary of this digital transformation. IoT devices can help the public transportation industry reduce costs in significant ways. Consider these four ways IoT is impacting the transportation industry's bottom line:



Edit with WPS Office

13. "Case Studies":

- ☐ Smart cities rely heavily on the Internet of Things (IoT). In 2017, nearly 60% of all installed IoT devices in smart cities were used in smart commercial buildings and transportation. By 2020, smart cities will use 1.39 billion connected things to deliver sustainability and accomplish climate change goals.
- ☐ However, the environment isn't the only beneficiary of this digital transformation. IoT devices can help the public transportation industry reduce costs in significant ways. Consider these four ways IoT is impacting the transportation industry's bottom line:



Edit with WPS Office



THANK YOU



Edit with WPS Office