

*CAI 1001C Spring 2025*

# APPLICATIONS OF 5G, IOT, AND AI IN TRANSPORTATION

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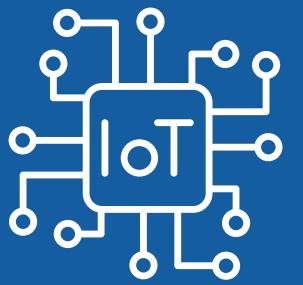


# THE FOUNDATION



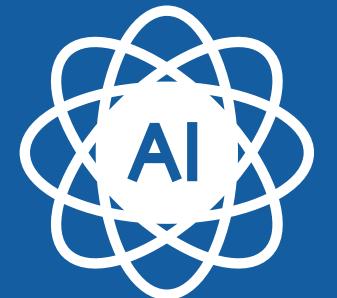
## 5G

Fifth-generation wireless technology offering ultra-low latency and high-speed data transfer.



## IoT

Network of interconnected devices communicating and exchanging data.



## AI

Simulation of human intelligence in machines programmed to think and learn.

## SIGNIFICANCE

These technologies collectively revolutionize transportation by enhancing connectivity, efficiency, and safety.



# THE ROLE OF 5G IN TODAY'S TRANSPORTATION SYSTEM

## Real Time Communication

Vehicles can share real-time information such as speed, location, and braking status. Example: If one car brakes suddenly nearby cars are alerted to avoid crashes.

## Support for Autonomous Vehicles

Makes it easier to use self-driving shuttles and taxis in busy or tricky places, like cities with a lot of traffic or pedestrian population.

## Improved Traffic Management

Improves how traffic lights are timed and coordinated with each other to work together more smoothly cutting down traffic jams.

[Source](#)



# IOT APPLICATIONS IN TRANSPORTATION

## Smart Traffic Lights

Traffic lights and sensors work together to watch and control traffic to keep it moving smoothly.

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## Talking Cars

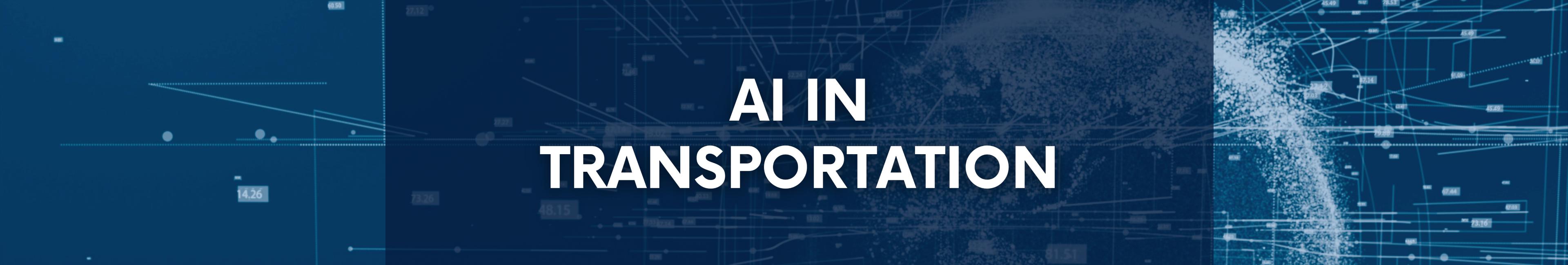
Cars can “talk” to traffic lights and road signs and even other cars to make driving safer, easier, and more enjoyable.

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## Tracking Buses and Trains

Keeps tracks or buses, trains, and other modes of public transportation in real-time to make them run on time and keep passengers informed.

**Source**



# AI IN TRANSPORTATION

## Predicting Accidents

Ai can look at data to figure out where accidents might happen and helps stop them before they do. It looks at weather, road conditions and driving behaviors to warn drivers.

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## Self-Driving Cars

AI helps cars drive on their own without needing a person to control them. It uses cameras sensors and maps to know its surroundings and make decisions.

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## Smarter Traffic

AI studies traffic patterns to keep cars moving and reduce traffic jams. It analyzes data from cameras and sensors at intersections to adjust and suggest better routes for drivers.

**Source**



# IMPROVING PEDESTRIAN SAFETY WITH AI

In 2022, 7,522 pedestrians were killed, marking a 40 year high.  
My little brother, Raife, was one of them. How could AI have saved his life?

## AI-Powered Pedestrian Detection

Cameras and sensors use AI to spot pedestrians and instantly warn drivers to prevent accidents and pedestrian deaths in real time.

## Predictive Modeling

AI looks at traffic data like vehicle speeds, pedestrian movements and time of day to predict the best times for pedestrians to cross safely.

## Smart Crosswalks

AI in crosswalks alert drivers when pedestrians are nearby, making crossing safer for everyone. It uses cameras and sensors to detect. The system can active warning signals like flashing lights to warn drivers.

**Source**

# FUTURE IMPLICATIONS OF 5G, IOT, AND AI IN TRANSPORTATION

## Advancements in AVs

Improved safety and efficiency through advances tech in self driving cars

## Smart City Infrastructure

Building smarter transportation systems to make cities safer and more efficient

## Policy and Regulation

The need for new rules to keep up with the latest technology in transportation

Source

# CONCLUSION

5G, IoT, and AI work together to make transportation safer and more efficient.

As technology keeps improving, transportation systems will continue to get better.

**Integration Benefits**

**Pedestrian Safety**

**Future Outlook:**

AI solutions make crossing streets safer for pedestrians.

**5G, IoT and AI technologies collectively revolutionize transportation by enhancing connectivity, efficiency, and safety.**