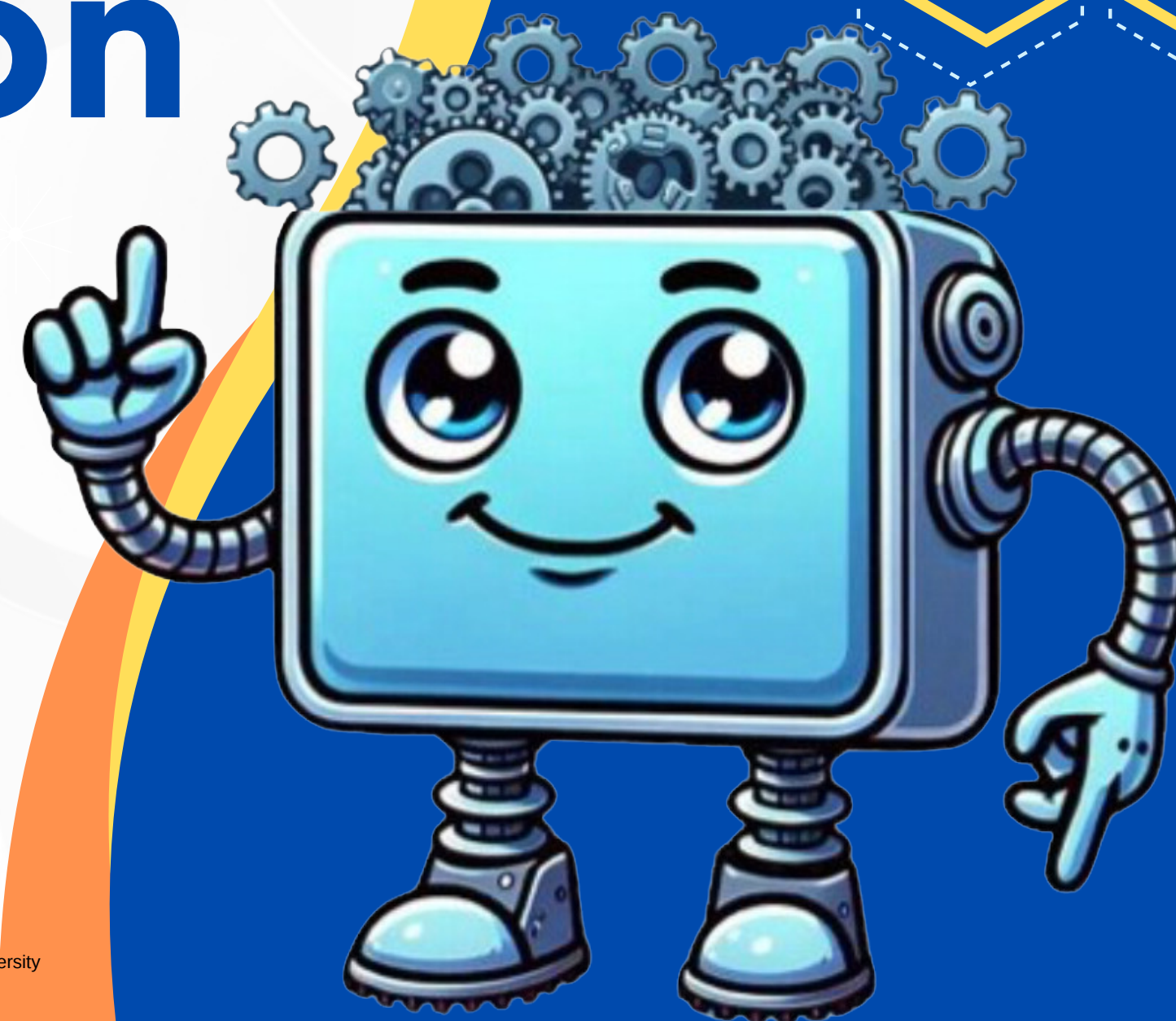


AI & Transportation

Understanding the Impact of Artificial Intelligence
(AI) in the Transportation Sector



Agenda

- Introduction to AI in Transportation
- Current Applications
- Environmental Impact
- Ethical and Social Implications
- Future of AI in Transportation



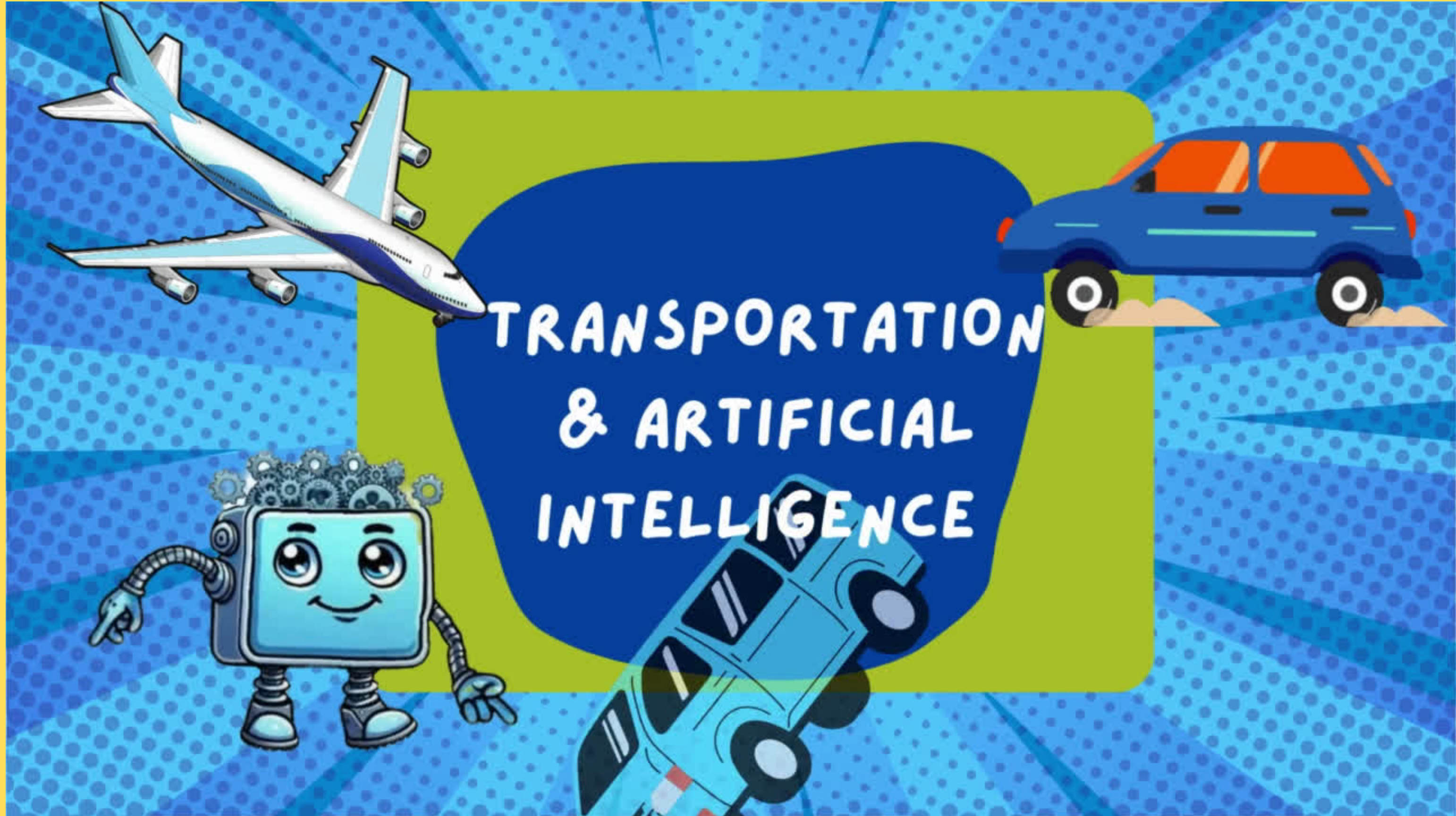
Introduction

AI in Transportation

AI is the simulation of human intelligence processes by machines, especially computer systems. AI enhances transportation by enabling smart systems that improve safety, efficiency, and user experience.

- ✓ AI has the potential to reduce traffic accidents by up to **90%** by eliminating human errors in driving decisions.
- ✓ AI can optimize public transportation schedules, potentially increasing efficiency by **20%** and reducing wait times for passengers.

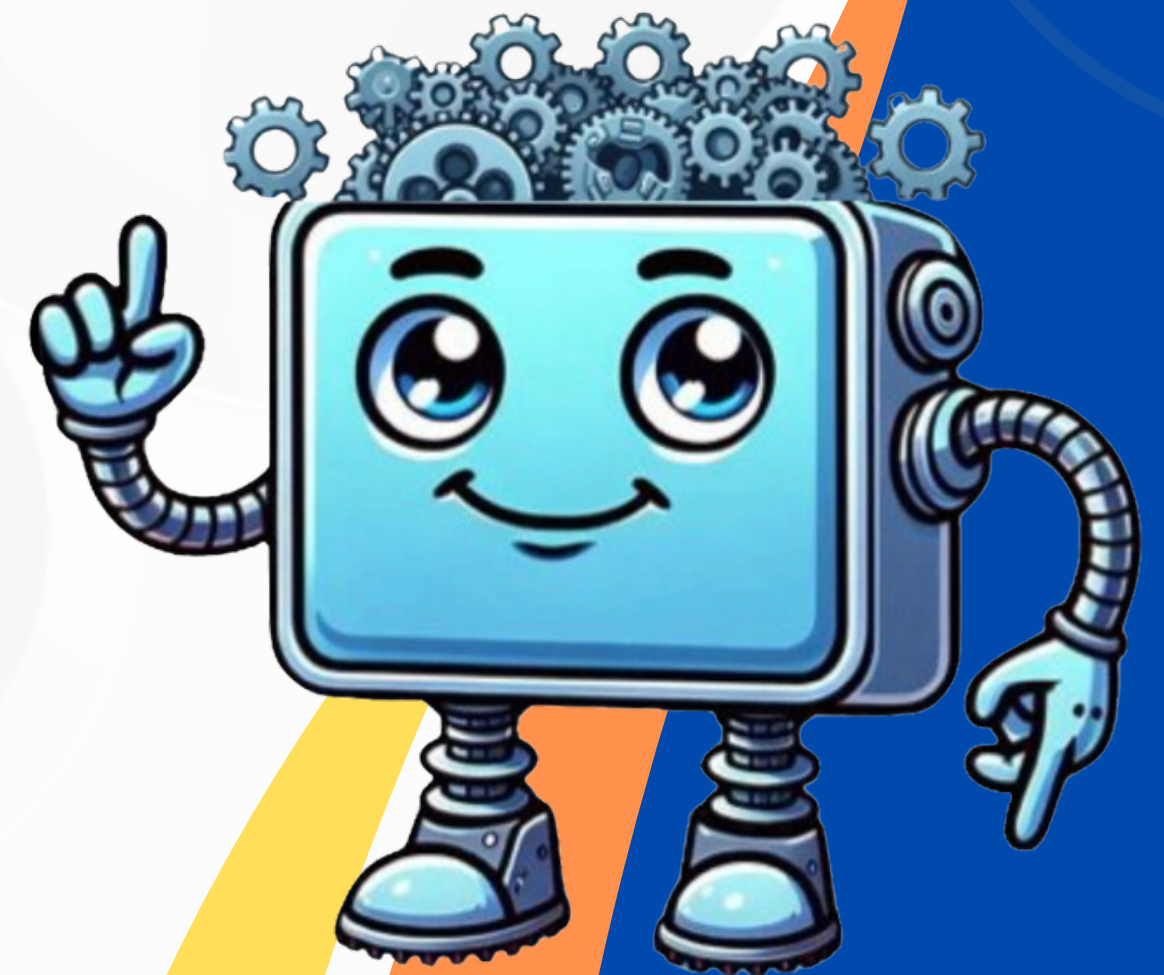




[If video doesn't play click here](#)

Short Stories With Cece

- Pay attention to how Cece and Max use AI to improve their virtual city's transportation system.
- Notice the importance of real-time data in adjusting bus and train schedules.
- Understand how traffic pattern analysis helps in predicting the best travel times and avoiding congestion.
- Remember that optimization is key to making transportation systems efficient.
- Learn how machine learning helps the system improve over time by predicting the best strategies for different conditions.
- Think about the integration of different AI technologies to create a comprehensive solution for public transportation and logistics.

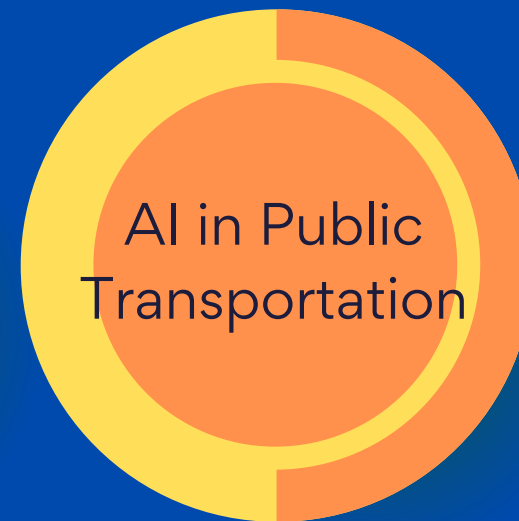


Current Applications



Trends

Some major applications of AI in transportation includes self-driving cars, route optimization, and traffic management.



Self-Driving Cars

Self-driving cars are special cars that can drive themselves without a human driver. They use sensors, cameras, and AI algorithms to navigate roads, detect obstacles, and make driving decisions.

They aim to reduce accidents caused by human error, though they require extensive testing and safety validation. They can help people who can't drive, like older adults or those with disabilities, get around easily.



Self-driving cars continually learn and improve from their experiences, making them a key part of the future of transportation.



Autonomous vehicles can improve fuel efficiency by up to 20% through optimized driving patterns & reduced idling.



There are five levels of autonomy for self-driving cars, ranging from Level 0 (no automation) to Level 5 (full automation).



Legal and regulatory frameworks, cybersecurity, and public trust are significant challenges.



[Click to view video](#)

Sphero Indi Obstacle Course and City Navigation

Activity Steps:

1. Setting Up the Course:

- Choose a flat, open space and place obstacles.
- Mark start and end points with colored tiles or tape.

2. Decomposing the Problem:

- Identify obstacles and plan the path.
- Break down the navigation task into smaller steps.

3. Programming the Sphero Indi:

- Use color tiles to program the Sphero Indi.
- Test, observe, and iterate the program.

4. Observing and Noting Patterns:

- Record observations on provided worksheets.
- Note successful navigation and difficulties.

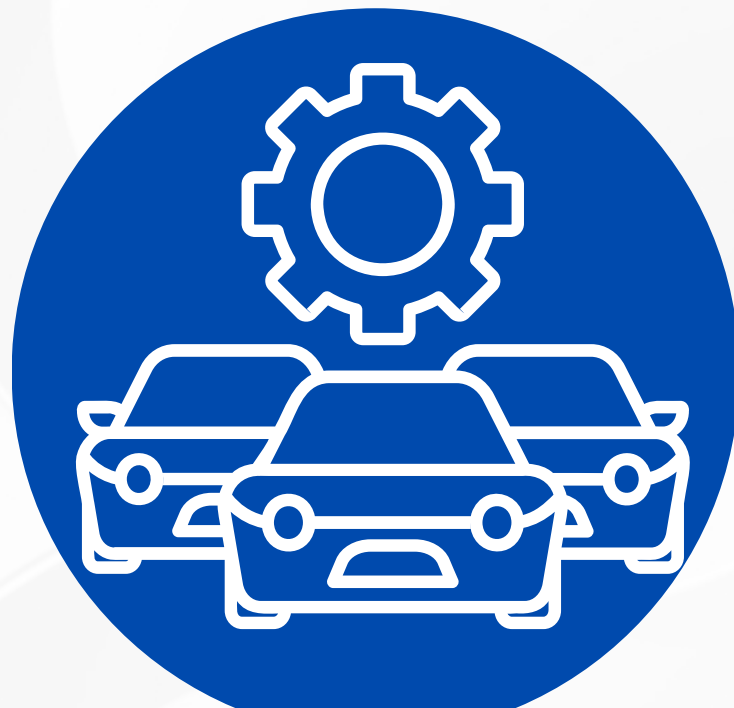
5. Creating and Navigating a City:

- Design a city layout with roads, buildings, and obstacles.
- Plan routes and program the Sphero Indi to navigate the city.
- Iterate and improve the program based on performance.



AI in Public Transportation

AI in public transportation helps buses, trains, and other public vehicles run better using smart technology. AI can help reduce wait times, save fuel, provide real-time report on traffic and enhance accessibility to people that use these



Efficiency

AI helps in determining the most efficient routes for buses and trains and for scheduling, real-time updates, and ticketing systems.



Accessibility

AI can make it easier for people with disabilities to use public transportation by providing helpful information.

Traffic Management

Traffic management with AI uses smart systems to control traffic lights and reduce traffic jams.



● Smart Traffic Lights

How AI controls traffic signals to reduce congestion.

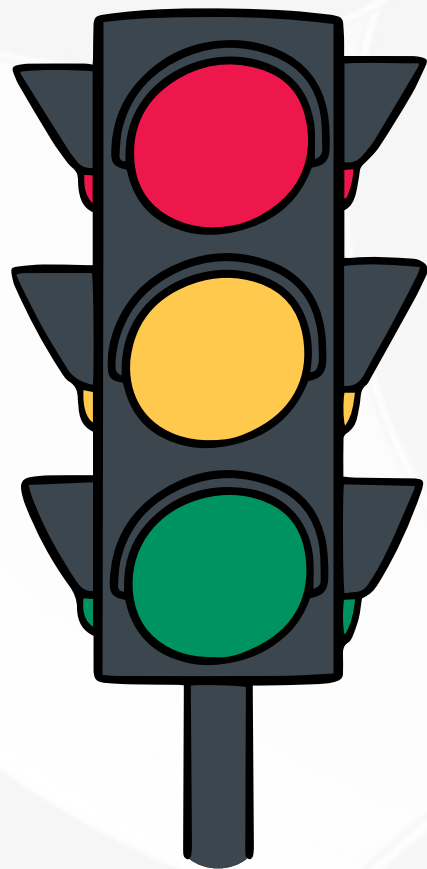
● Traffic Flow Prediction

Using AI to predict and manage traffic patterns.

● Incident Detection & Response

AI systems that detect accidents or breakdowns and dispatch emergency services.

Red Light, Green Light - Traffic Management



Introduction:

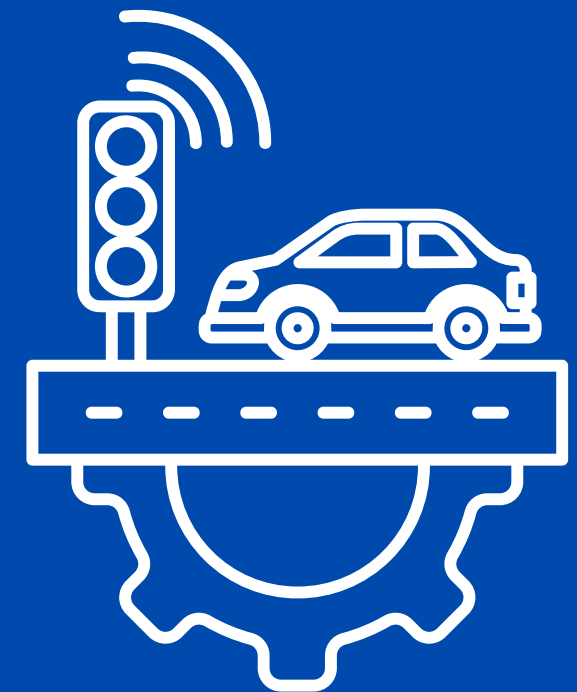
- Traffic Lights Purpose:
 - Control the flow of cars and pedestrians.
 - Keep everyone safe and traffic moving smoothly.
- AI in Traffic Management:
 - Sensors and algorithms control traffic lights based on real-time conditions.

Game Setup:

- Designate Areas:
 - Starting line and finish line.
- Traffic Light Controller:
 - Holds red, yellow, and green circles.

How to Play:

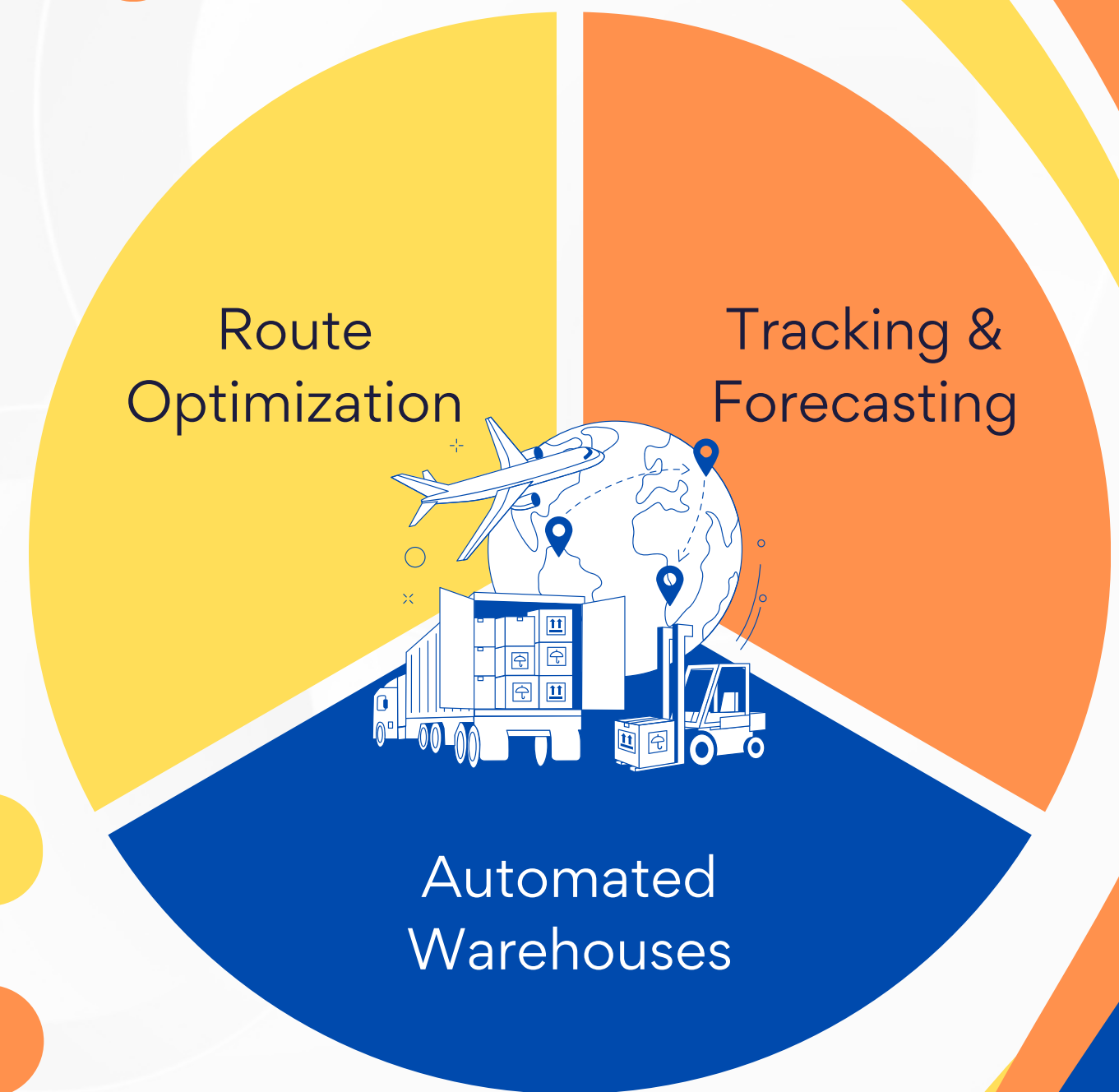
1. Green Light:
 - Students move towards the finish line.
2. Red Light:
 - Students stop immediately.
3. Yellow Light:
 - Students walk slowly and carefully.



AI in Logistics & Freight

AI in logistics helps with the delivery and transportation of goods using smart technology.

- ✓ AI finds the best routes for delivery trucks to save time and fuel.
- ✓ AI keeps track of supplies and shipments, predicting needs and delivery times to ensure customer satisfaction.
- ✓ Robots and smart systems in warehouses help move and organize goods quickly and accurately.



Environmental Impact

Reduction in Emissions

AI can optimize routes and promote electric vehicles, reducing emissions.

Traffic Management

AI-driven traffic systems can reduce congestion and idling time, lowering emissions.

Resource Management

AI helps manage vehicle fleets efficiently, reducing their environmental footprint.

Sustainable Practices

AI promotes carpooling, ride-sharing, and enhanced public transportation to reduce vehicle use.

The implementation of AI in transportation can improve environmental impact by reducing emission, enhancing traffic and resource management and encouraging sustainable practices.



Ethical & Social Implications

Privacy Concerns

Ethical Decision-Making

Bias and Fairness

Job Displacement

Protecting AI-collected data, designing unbiased AI systems for equitable access, and regulating autonomous vehicles are crucial for ethical AI use.



Click to view
video



Future of AI in Transportation

The future of AI in transportation includes advancements like fully autonomous vehicles, smarter traffic management systems, and more efficient public transportation, leading to safer, more reliable, and eco-friendly travel options.

01.

Intelligent Infrastructure

Smart roads and connected vehicles optimize traffic flow and safety

02.

Personalized Transportation

AI provides personalized travel recommendations and on-demand mobility services.

03.

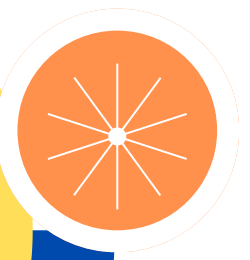
Sustainability Initiatives

AI supports green transportation practices and urban planning for smarter cities.

04.

Global Connectivity

AI enables seamless travel across different modes and international collaboration on transportation



LogiTycoon

Logistics is about planning and organizing how things, like products or packages, move from one place to another. It makes sure that everything gets where it needs to go on time and in the best way possible.

- In this activity we will pretend to own a trucking company
 - Simulate managing a logistics company and see AI in action.
- Key Points:
 - Explore route planning, inventory management, and decision-making.
 - Understand how AI helps improve efficiency and reduce environmental impact.
- Remember:
 - The game can be challenging, but don't worry! The goal is to explore and see how AI can help in logistics.



Glossary

Artificial Intelligence (AI): Technology that allows machines to perform tasks that typically require human intelligence, such as learning from experience and making decisions based on data.

Public Transportation: Systems like buses and trains that are used by the public to travel within cities and between locations.

Traffic Management: The use of technology and strategies to control and optimize the flow of vehicles on roads and highways.

Logistics: The detailed coordination of complex operations involving the movement and storage of goods and resources.

Freight: Goods transported in bulk, typically by trucks, trains, ships, or planes.

Algorithms: Step-by-step instructions or rules followed by a computer to solve problems or perform tasks.

Traffic Flow: The movement of vehicles through an area, managed to minimize congestion and delays.

Machine Learning: A type of AI that enables computers to learn from data and improve their performance over time without being explicitly programmed.

Radar: A technology that uses radio waves to detect objects and determine their distance, speed, and direction.

LiDAR: A technology that uses laser pulses to measure distances and create detailed, 3D maps of surroundings.

Glossary

Public Transit: Transportation services like buses and trains that are available for use by the general public.

Traffic Congestion: Traffic jams or gridlock caused by too many vehicles on the road at the same time.

Real-time Data: Information that is updated immediately and reflects current conditions or events.

AI Algorithms: Instructions or rules used by AI systems to process data and make decisions or predictions.

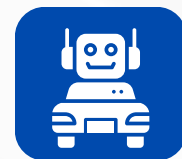
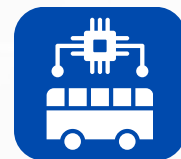
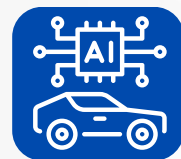
Sensors: Devices that detect and respond to inputs from the physical environment, such as temperature, light, or motion.

GPS: Global Positioning System, a satellite-based navigation system that provides location and time information anywhere on Earth.

Optimize: To make something as effective, functional, or efficient as possible.

Resources

Click on each icon below to explore the different resources to extend the learning of concepts related to AI in transportation.



Thank You

For your attention

