# PUBLIC TRANSPORTATION ANALYSIS

## ABSTRACT:

For modern urban living, efficient and accessible public transportation systems are essential. This project undertakes a thorough "Public Transportation Analysis" to examine the existing health of public transit networks, determine how they affect communities, and suggest data-driven improvements. This analysis aims to improve the efficiency and sustainability of public transportation, ultimately seeking to create more connected and liveable communities. It does this through data collection, route optimization, and community participation.

## MODULE OUTLINE:

### 1. Data Collection and Preprocessing:

Data Sources: Collect data from various sources such as GPS trackers on vehicles, ticketing systems, weather APIs, and traffic data.

Data Cleaning: Clean and preprocess the collected data to handle missing values, outliers, and inconsistencies.

Data Integration: Combine data from multiple sources to create a unified dataset for analysis.

### 2. Exploratory Data Analysis (EDA):

Visualize and explore the data to gain insights into passenger behavior, traffic patterns, and system performance.

Identify key trends and anomalies in the data.

### 3. Demand Forecasting:

Develop models to forecast passenger demand for different routes and times.

Utilize time series analysis and machine learning algorithms for accurate predictions.

**4. Route Optimization:**

Optimize bus/train routes based on historical data and real-time traffic information.

Minimize travel time, reduce congestion, and improve efficiency.

**5. Real-time Passenger Information:**

Create a system to provide real-time updates to passengers, including estimated arrival times and service disruptions.

Enhance the passenger experience and increase overall satisfaction.

**6. Maintenance Scheduling:**

Implement predictive maintenance models to schedule maintenance activities for vehicles and infrastructure.

Reduce downtime and ensure the safety and reliability of public transportation systems.

**7. Performance Monitoring:**

Develop dashboards and KPIs to monitor the performance of public transportation systems.

Continuously assess and improve system efficiency and reliability.

**8. Sustainability Analysis:**

Analyse the environmental impact of public transportation systems.

Explore ways to reduce emissions and promote sustainability.

**9. Stakeholder Engagement:**

Collaborate with transportation authorities, city planners, and other stakeholders to implement data-driven solutions.

Ensure that the project aligns with the goals and needs of the community.

**10. Evaluation and Feedback Loop:**

Continuously evaluate the effectiveness of implemented solutions.

Collect feedback from passengers and stakeholders for further improvements.