

# PUBLIC TRANSPORT OPTIMAZATION

## Phase1:Problem Definition and Design Thinking

### I. PROBLEM DEFINITION

TRANSPORTATION OPTIMIZATION is the process of analyzing shipments, rates and. constraints to produce realistic load plans that reduce overall freight spend and gain efficiencies across entire transportation networks. Once actual freight rates, approved carriers, specified capacities, transit times and other available data are entered into the optimization platform, the software generates a realistic, executable load plan for the shipment. With this information in hand, shippers, 3PLs, and consultants can make better decisions, save valuable resources, improve revenues and cut costs.

### II. DESIGN THINKING

#### 1. Project Objectives:

- a) **Real time transit information:** Real-time information, broadly defined, means any information available to transit providers or customers about the current status of vehicles, including approximate locations and predictive arrival times.
- b) **Arrival time prediction:** a tool that estimates the time it will take for a person or object to arrive at a particular destination. It uses data such as current location, traffic conditions, and historical travel patterns to make this prediction.
- c) **Ridership monitoring:** Real-time public transit ridership flow and origin– destination (O–D) information is essential for improving transit service quality and optimizing transit networks in smart cities. The effectiveness and accuracy of the traditional surveybased methods and smart card data-driven methods for O–D information inference have multiple disadvantages in terms of biased results, high latency, insufficient sample size, and the high cost of time and energy.
- d) **Enhanced public transportation services:** Such solutions hold great potential to improve the efficiency of public transit systems through initiatives such as smart-ticketing, one nation-one card, security surveillance,

fleet management, traffic management and real-time passenger information among others.

## 2. IOT Sensor Design:

- a) **Identify Locations:** Access the public places (public roads) where public transportation monitoring is necessary and prioritize them based on their usage .
- b) : **Choose appropriate sensors:** Select IoT sensors capable of measuring public transportation accurately and reliably in the identified locations. Consider factors such as sensor efficiency, durability, cost-effectiveness, and ease of maintenance.
- c) **Determine deployment strategy:** Plan the installation and placement of IoT sensors in the identified locations to ensure optimal data collection and coverage. Consider factors such as proximity to ease of access for maintenance, and minimizing tampering and theft.

## 3. Real Time Transmit Information Platforms:

- a) **Design a user interface:** Develop a user-friendly mobile app interface or website that displays real-time water consumption data in an easily understandable format.
- b) **Intractive Features:** Include interactive features such as charts, graphs, and notifications to engage users and raise awareness about water conservation.
- c) **Data privacy and security:** Implement robust security measures to protect the collected data and ensure user privacy.

## 4. Integration Approach:

- a) **Communication protocols:** Determine the communication protocols to be used for transmitting data from the IoT sensors to the data-sharing platform. Consider factors such as reliability, data transfer rate, and compatibility with existing infrastructure.

- b) **Data-sharing platform:** Develop a centralized data-sharing platform where the collected water consumption data can be stored and accessed by the mobile app or website.
- c) **Integration with IoT technology and Python:** Use IoT technology and Python programming to integrate the IoT sensors, data-sharing platform, and user interface. This will involve developing APIs, setting up data transfer protocols, and implementing data analytics and visualization tools.

### III. CONCLUSION:

In conclusion, public transportation is a cornerstone of sustainable urban development. It is instrumental in promoting economic growth, environmental sustainability, and social equity.