**PHASE 1**

**PROBLEM DEFINITION AND DESIGN THINKING**

**Project title:** *Energy Consumption on public transportation optimization*

**Problem Definition:**

*The problem of energy efficiency in public transportation optimization involves addressing the significant energy consumption and environmental impact associated with public transit systems. This issue arises due to factors such as outdated vehicles, inefficient routes, and high energy consumption, which contribute to increased greenhouse gas emissions and operational costs. The goal is to reduce energy consumption, minimize environmental impact, and enhance the overall efficiency of public transportation systems.*

**Design Thinking:**

**1.Empathize**:

* *Understand the needs and pain points of both passengers and transit operators.*
* *Gather data on current energy consumption patterns and environmental impacts.*
* *Conduct surveys, interviews, and observations to gain insights into user experiences.*

**2.Define:**

* *Clearly define the problem, its scope, and its impact on society, the environment, and the economy.*
* *Identify key stakeholders, including government agencies, transit companies, and passengers.*
* *Create user personas to represent different passenger profiles and their needs.*

**3.Ideate:**

* *Brainstorm potential solutions to improve energy efficiency in public transportation.*
* *Consider innovative technologies such as electric or hybrid buses, renewable energy sources, and predictive maintenance.*
* *Explore strategies for optimizing routes, schedules, and vehicle maintenance.*

**4.Prototype:**

* *Develop prototypes or pilot projects to test selected solutions.*
* *Implement energy-efficient technologies in a limited area or on specific routes.*
* *Collect data on the performance and feasibility of these solutions.*

**5.Test:**

* *Evaluate the prototypes or pilot projects based on energy consumption, environmental impact, cost-effectiveness, and user satisfaction.*
* *Gather feedback from passengers, drivers, and transit operators.*
* *Adjust and refine the solutions based on the test results.*

**6.Implement:**

* *Scale up successful prototypes to the entire public transportation system.*
* *Collaborate with government agencies and private sector partners to secure funding and support for implementation.*
* *Monitor ongoing performance and make continuous improvements*.

**7.Iterate:**

* *Continuously gather data on energy efficiency and environmental impact.*
* *Identify new technologies and strategies to further improve energy efficiency.*
* *Adapt to changing needs and emerging trends in public transportation and sustainability.*

*By applying a design thinking approach, public transportation systems can systematically address the problem of energy efficiency, leading to reduced energy consumption, lower emissions, improved user experiences, and cost savings for both operators and passengers.*