**Public Transport Optimization**

**Introduction :**

Efficient public transportation systems play a pivotal role in the growth and sustainability of urban areas. They offer numerous benefits, including reduced traffic congestion, lower carbon emissions, improved accessibility, and increased mobility for the community. However, many public transportation systems face challenges such as inefficient routes, overcrowding, and outdated technology, leading to a decline in overall service quality. To address these issues, we are embarking on a comprehensive Public Transportation Optimization Project.

**Innovating Stimulation :**

<https://wokwi.com/projects/378291601637348353>

**Project Objectives :**

**1.** **Enhance Efficiency:** The primary objective of this project is to improve the efficiency of public transportation systems by optimizing routes, schedules, and resources.

**2.Reduce Congestion:** By providing more efficient public transportation, we aim to reduce traffic congestion and contribute to a cleaner, healthier environment.

**3.** **Increase Accessibility:** The project will focus on making public transportation more accessible to a broader range of people, including those with disabilities, the elderly, and low-income communities.

**4.** **Improve Customer Experience:** We intend to enhance the overall customer experience by offering real-time information, user-friendly payment systems, and more comfortable travel options.

**Methodology :**

**1.Data Analysis:** We will conduct a comprehensive analysis of historical transportation data, including ridership statistics, route performance, and customer feedback.

**2.Route Optimization:** Through the utilization of advanced algorithms and data analysis, we will optimize routes to ensure better coverage and reduced travel times.

**3.Schedule Optimization:** Adjusting and optimizing schedules to meet demand patterns and provide more convenient services to the public.

**4.Technology Integration:** We will introduce modern technologies such as real-time tracking, mobile applications, and contactless payment options to improve accessibility and user experience.

**5.Sustainability Initiatives:** Incorporating eco-friendly practices, such as adopting electric or hybrid vehicles, to reduce the carbon footprint of public transportation.

**Coding :**

#include <Wire.h>

#include <LiquidCrystal\_I2C.h>

const int ldrPin = A0;

const float BETA = 3950;       // LDR input pin

const int ledPin1 = 13;

int ledpin2=12;         // LED for night/day indication

const int tempSensorPin = A1;   // Temperature sensor input pin

const int i2cAddress = 0x27;    // I2C address of your LCD display

LiquidCrystal\_I2C lcd(i2cAddress, 20, 4); // Initialize the LCD library with the I2C address and size

int ldrThreshold = 500;          // Adjust this value based on your LDR sensitivity

int temperatureThreshold = 25;   // Adjust this value based on your desired low temperature

void setup() {

pinMode(ledPin1, OUTPUT);

pinMode(ledpin2, OUTPUT);

lcd.init();                      // Initialize the LCD

lcd.backlight();                 // Turn on the backlight

**Serial**.begin(9600);

}

void loop() {

int ldrValue = analogRead(ldrPin);

int tempValue = analogRead(tempSensorPin);

float voltage = (tempValue / 1024.0) \* 5.0; // Convert analog reading to voltage

float celsius = 1 / (log(1 / (1023. / tempValue - 1)) / BETA + 1.0 / 298.15) - 273.15; // Convert voltage to temperature in Celsius

**Serial**.print("LDR Value: ");

**Serial**.println(ldrValue);

**Serial**.print("Temperature: ");

**Serial**.println(celsius);

if (ldrValue < ldrThreshold) {

// It's dark, turn on the LED for night indication

digitalWrite(ledPin1, HIGH);

} else {

// It's light, turn off the LED for day indication

digitalWrite(ledPin1, LOW);

}

lcd.clear();

lcd.setCursor(0, 0);

if (digitalRead(ledPin1) == HIGH) {

lcd.print("Night Time");

} else {

lcd.print("Day Time");

}

lcd.setCursor(0, 1);

lcd.print("Temperature: ");

lcd.print(celsius);

lcd.print("C");

if (celsius < temperatureThreshold) {

// Temperature is low, make the LED glow lightly

digitalWrite(ledpin2, 1); // Adjust the value as needed for desired brightness

} else {

// Temperature is not low, turn off the LED

digitalWrite(ledpin2, 0);

}

delay(1000); // Delay for 1 second before taking readings again

}

**Flowchart :**

**Data Analysis**

**Route Optimization**

**Technology Integration**

**Schedule Optimization**

**Eco Friendliness**

**Financial Sustainability**

**Municipal Government**

**&**

**Community Representative**

**Stake Holders Enagement**

**Conclusion :**

This project seeks to transform public transportation into a more efficient, accessible, and sustainable mode of travel. By optimizing routes, schedules, and technology, we aim to enhance the overall transportation experience for the community while addressing congestion and environmental concerns. The success of this project will result in a more vibrant, sustainable, and accessible urban environment for all residents. And the Simulation in given above.