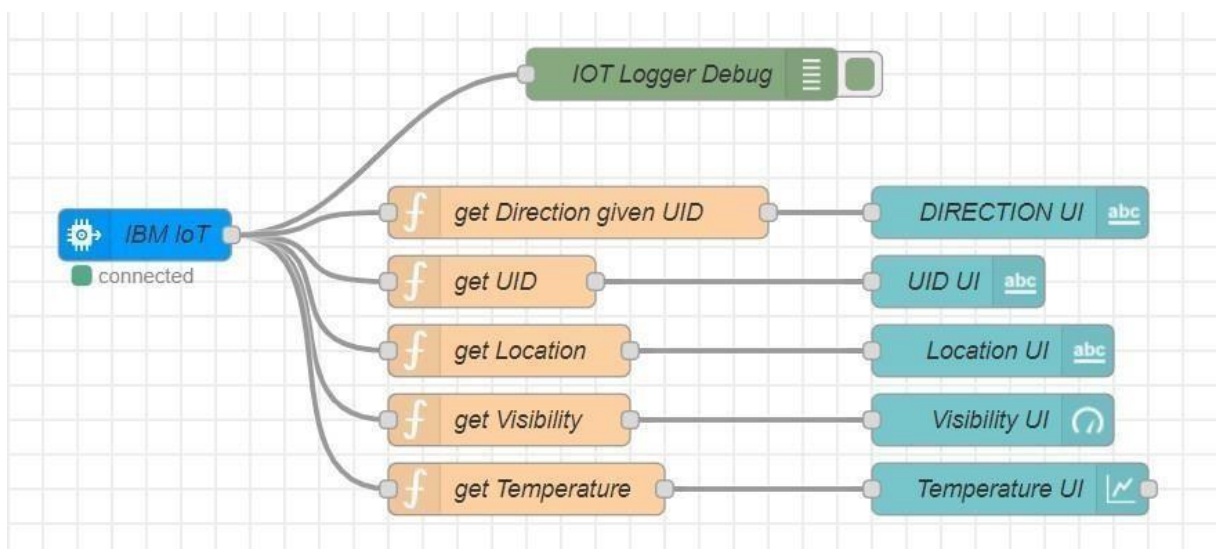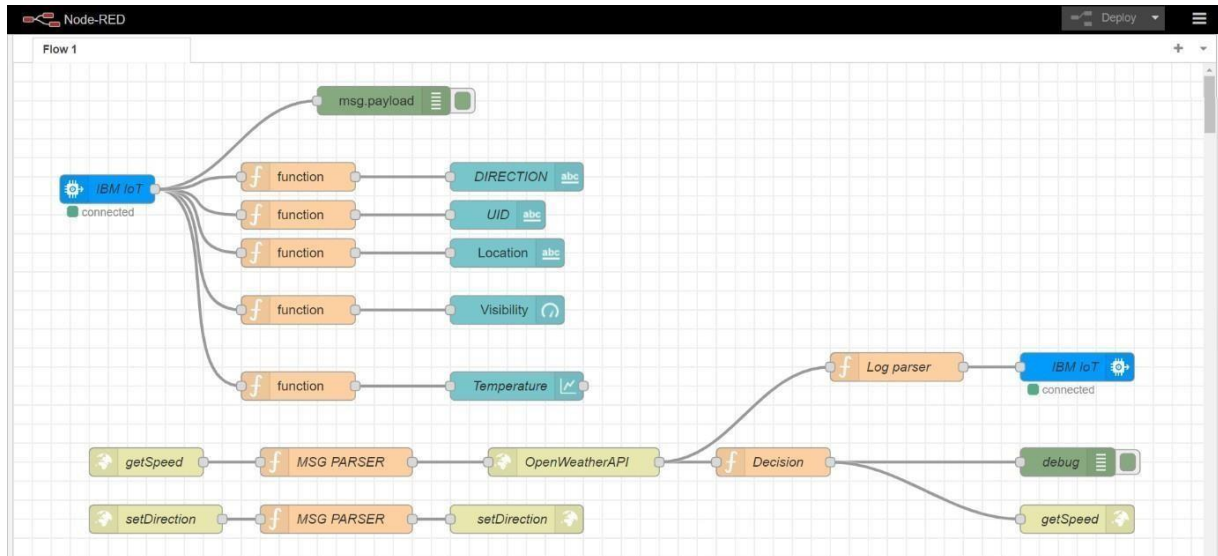# Sprint-4
Signs with Smart Connectivity for Better Road Safety

Team ID	PNT2022TMID12332
Project Name	Signs with smart connectivity for Better road safety

Node RED flow :


```
// get Direction given UID
msg.payload = global.get(String(msg.payload.uid)); return
msg;

// get UID msg.payload =
msg.payload.uid; return msg;

// get Location msg.payload =
msg.payload.location; return msg;

// get Visibility msg.payload =
msg.payload.visibility; return msg;

// get Temperature msg.payload =
msg.payload.temperature;
return msg;
```
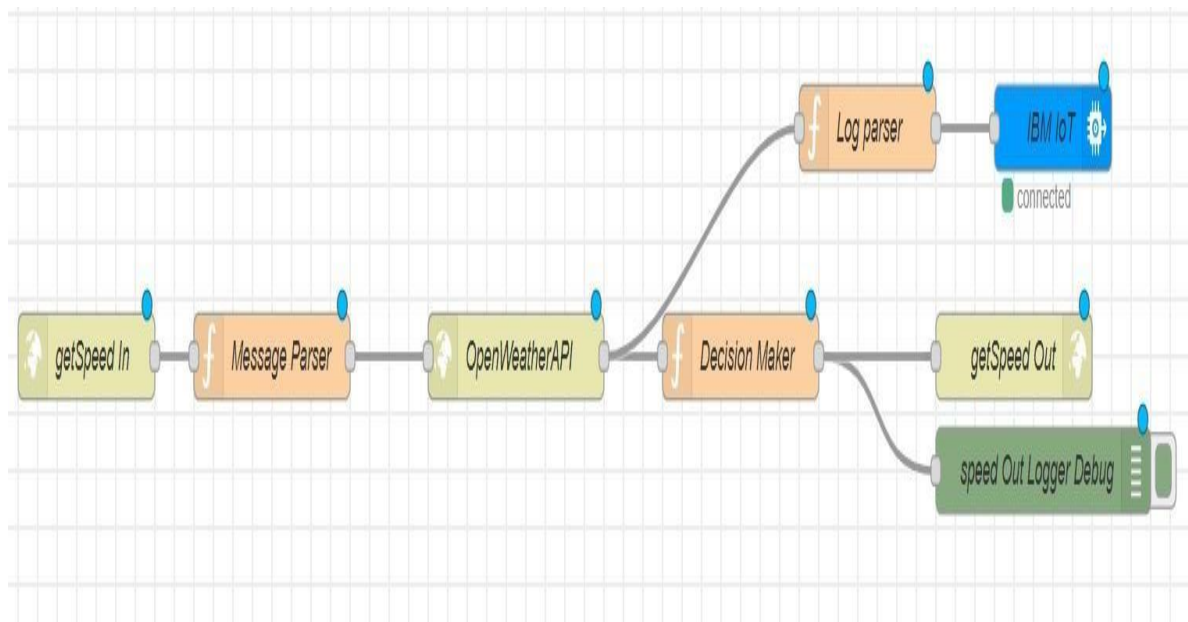
getSpeed API flow :

```
weatherObj = JSON.parse(JSON.stringify(msg.payload));
localityObj        =        global.get("data");        var
suggestedSpeedPercentage = 100;

var    preciseObject   =   {   temperature   :
    weatherObj.main.temp - 273.15, location :
    localityObj.location,          visibility          :
    weatherObj.visibility/100,          uid          :
    localityObj.uid,
    direction : global.get("direction") };

msg.payload = preciseObject; return

msg;


weatherObj = JSON.parse(JSON.stringify(msg.payload));
localityObj        =        global.get("data");        var
suggestedSpeedPercentage = 100;

var    preciseObject   =   {   temperature   :
    weatherObj.main.temp - 273.15,
    weather : weatherObj.weather.map(x=>x.id).filter(code => code<700),
visibility : weatherObj.visibility/100 };

if(preciseObject.visibility<=40) suggestedSpeedPercentage
    -=30

switch(String(preciseObject.weather)[-1])   //   https://openweathermap.org/weather-
conditions refer weather codes meaning here
{ case "0" : suggestedSpeedPercentage -=10;break; case
    "1" : suggestedSpeedPercentage -=20;break; case "2"
    :
    suggestedSpeedPercentage -=30;break; }

msg.payload = preciseObject;

var doNotHonk = 0;
if(localityObj.hospitalZone=="1"||localityObj.schoolZone=="1")
    doNotHonk = 1;

var        returnObject        =        {        suggestedSpeed        :
    localityObj.usualSpeedLimit*(suggestedSpeedPercentage/100),   doNotHonk   :
    doNotHonk
}
msg.payload   =   String(returnObject.suggestedSpeed)   +   "   kmph   \n\n"   +
(returnObject.doNotHonk==1?"Do Not Honk":"") + "$" +
global.get(String(localityObj.uid));

return msg;
```
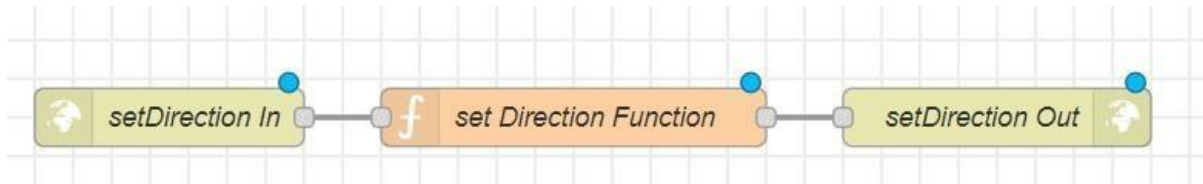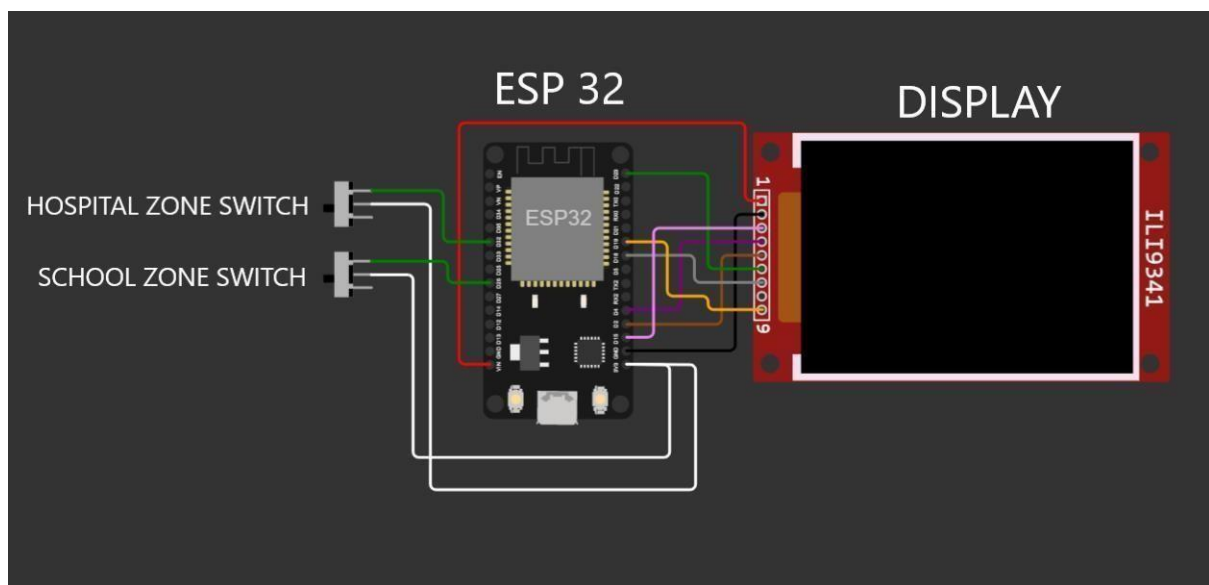
global.set(String(msg.payload.uid),msg.payload.dir);

 return msg;

Circuit Diagram :

ESP 32 CODE :

```
#include <WiFi.h> #include
<HTTPClient.h> #include
<Adafruit_GFX.h>
#include <Adafruit_ILI9341.h>
#include <string.h>

const char* ssid = "Wokwi-GUEST";
const char* password = "";

#define TFT_DC 2
#define TFT_CS 15
Adafruit_ILI9341 tft = Adafruit_ILI9341(TFT_CS, TFT_DC);

String myLocation = "Chennai,IN"; String usualSpeedLimit
= "70"; // kmph

int schoolZone = 32; int hospitalZone
= 26;
```

```cpp
int uid = 2504; // ID Unique to this Micro Contoller String getString(char
x)
{
    String s(1, x); return
    s;
}

String stringSplitter1(String fullString,char delimiter='$')
{
    String returnString = "";
    for(int i = 0; i<fullString.length();i++) { char c
        = fullString[i]; if(delimiter==c) break;
        returnString+=String(c);
    }
    return(returnString);
}

String stringSplitter2(String fullString,char delimiter='$')
{
    String returnString = ""; bool flag
    = false;
    for(int i = 0; i<fullString.length();i++) { char c =
        fullString[i];                          if(flag)
        returnString+=String(c);    if(delimiter==c)
        flag = true;
    }
    return(returnString);
}

void rightArrow()
{ int refX = 50;
   int refY = tft.getCursorY() + 40;

   tft.fillRect(refX,refY,100,20,ILI9341_RED);
   tft.fillTriangle(refX+100,refY-
30,refX+100,refY+50,refX+40+100,refY+10,ILI9341_RED);
}

void leftArrow()
{ int refX = 50;
   int refY = tft.getCursorY() + 40;

   tft.fillRect(refX+40,refY,100,20,ILI9341_RED); tft.fillTriangle(refX+40,refY-
   30,refX+40,refY+50,refX,refY+10,ILI9341_RED);
}

void upArrow()
{ int refX = 125;
   int refY = tft.getCursorY() + 30;
```

```
    tft.fillTriangle(refX-
40,refY+40,refX+40,refY+40,refX,refY,ILI9341_RED); tft.fillRect(refX-
15,refY+40,30,20,ILI9341_RED); }

String APICall() {
    HTTPClient http;

    String          url          =          "https://node-red-grseb-2022-11-05-test.eu-
gb.mybluemix.net/getSpeed?";
    url += "location="+myLocation+"&";
    url += "schoolZone="+(String)digitalRead(schoolZone)+(String)"&"; url +=
    "hospitalZone="+(String)digitalRead(hospitalZone)+(String)"&";url +=
    "usualSpeedLimit="+(String)usualSpeedLimit+(String)"&";
    url       +=       "uid="+(String)uid;
    http.begin(url.c_str());              int
    httpResponseCode = http.GET();

    if (httpResponseCode>0) {
      String payload = http.getString(); http.end(); return(payload);
    } else
    {
      Serial.print("Error code: ");
      Serial.println(httpResponseCode);
    } http.end();
}

void myPrint(String contents) {
    tft.fillScreen(ILI9341_BLACK);
    tft.setCursor(0, 20);
    tft.setTextSize(4);
    tft.setTextColor(ILI9341_RED);
    //tft.println(contents);

    tft.println(stringSplitter1(contents)); String c2
    =  stringSplitter2(contents);  if(c2=="s")  //
    represents Straight
    { upArrow();
    }
    if(c2=="l") // represents left
    { leftArrow();
    }
    if(c2=="r") // represents right
    { rightArrow();
    }
}

void setup() {
    WiFi.begin(ssid, password, 6);

    tft.begin();
    tft.setRotation(1);
```

```
    tft.setTextColor(ILI9341_WHITE);
    tft.setTextSize(2);
    tft.print("Connecting to WiFi");

    while (WiFi.status() != WL_CONNECTED)
      {                delay(100);
        tft.print(".");
    }

    tft.print("\nOK! IP="); tft.println(WiFi.localIP());
}

void loop() { myPrint(APICall());
    delay(100);
}
```
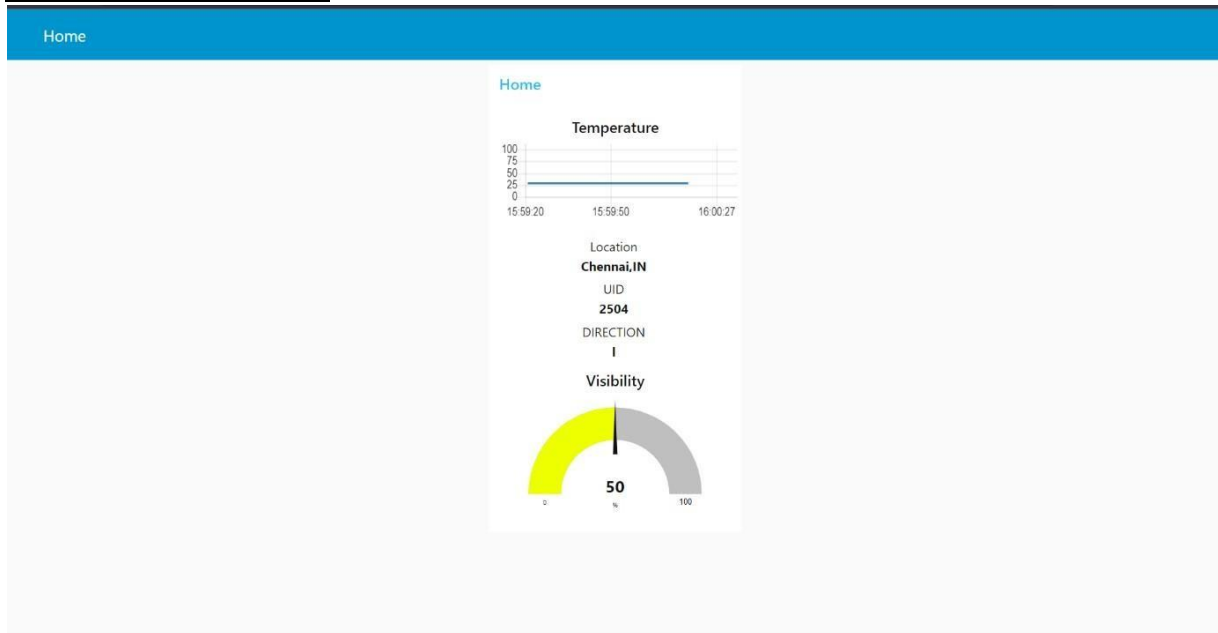
Output :

Node RED Dashboard :

Wokwi Output :

{"uid":"2504","dir":"r"}

```
#include <WiFi.h>
#include <HTTPClient.h>
#include <Adafruit_GFX.h>
#include <Adafruit_ILI9341.h>
#include <string.h>

const char* ssid = "Wokwi-GUEST";
const char* password = "";

#define TFT_DC 2
#define TFT_CS 15
Adafruit_ILI9341 tft = Adafruit_ILI9341(TFT_

String myLocation = "Chennai,IN";
String usualSpeedLimit = "70"; // kmph

int schoolZone = 32;
int hospitalZone = 26;

int uid = 2504;

String getString(char x)
{
    String s(1, x);
    return s;
}

String stringSplitter1(String fullString,cha
{
    String returnString = "";
    for(int i = 0; i<fullString.length();i++
        char c = fullString[i];
        if(delimiter==c)
            break;
        returnString+=String(c);
    }
```

```
1   #include <WiFi.h>
2   #include <HTTPClient.h>
3   #include <Adafruit_GFX.h>
4   #include <Adafruit_ILI9341.h>
5   #include <string.h>
6
7   const char* ssid = "Wokwi-GUEST";
8   const char* password = "";
```

https://node-red-grseb-2022-11 × +
← → C 🔒 net/setDirection?uid=2504&dir=1 ☆
{"uid":"2504","dir":"1"}

```
14  St
15  St
16
17  in
18  in
19
20  in
21
22  St
23  {
24
25
26  }
27
28  St
29  {
30
31
32          char c = fullString[i];
33          if(delimiter==c)
34              break;
35          returnString+=String(c);
36  }
```

70 kmph
Do Not Honk

ILI9341