Real-Time Traffic Monitoring System:

```
#include <bits/stdc++.h>
#include <chrono>
#include <thread>
#include <string>
#include <vector>
#include <cstdlib>
using namespace std;
class TrafficCamera {
public:
    TrafficCamera(const string& location) : location(location), vehiclesDetected(0), averageSpeed(0) {}
    void monitorTraffic() {
        vehiclesDetected = rand() % 100;
        averageSpeed = rand() % 80 + 20;
        cout << "Camera at " << location << " is monitoring traffic..." << endl;
          cout << "Vehicles detected: " << vehiclesDetected << ", Average speed: " << averageSpeed << "
km/h" << endl;
        this_thread::sleep_for(chrono::seconds(2));
    }
    bool detectAccident() {
        return rand() % 10 < 2;
    }
    void alertAuthorities(const string& incidentDetails) {
```

```
        cout << "ALERT: " << incidentDetails << " at " << location << "!" << endl;
    }
    string getLocation() const {
        return location;
    }
private:
    string location;
    int vehiclesDetected;
    int averageSpeed;
};
class TrafficMonitoringSystem {
public:
    void addCamera(const string& location) {
        cameras.emplace_back(location);
    }

    void startMonitoring() {
        cout << "Starting traffic monitoring system..." << endl;
        while (true) {
            for (auto& camera : cameras) {
                camera.monitorTraffic();
                if (camera.detectAccident()) {
                    camera.alertAuthorities("Accident detected");
                } else {
```

```
                cout << "No incidents detected at " << camera.getLocation() << "." << endl;
            }
        }
        cout << "Monitoring cycle complete. Restarting..." << endl;
        this_thread::sleep_for(chrono::seconds(5));
    }
}

private:
    vector<TrafficCamera> cameras;
};

class SmartTrafficManagementSystem {
public:
    void welcome() {
        while (true) {
            clearScreen();
            displayWelcomeMessage();
            int choice;
            if (!(cin >> choice)) {
                cin.clear();
                cin.ignore(numeric_limits<streamsize>::max(), '\n');
                cout << "Enter a valid option!" << endl;
                delay(1);
```

```
    continue;
}

switch (choice) {
    case 1:
        displayVehicleRecords();
        break;
    case 2:
        displayChallanRecords();
        break;
    case 3:
        vehSearch();
        break;
    case 4:
        trafContBooth();
        break;
    case 5:
        controlTraffic();
        break;
    case 6:
        helpInfo();
        break;
    default:
        cout << "Enter a valid option!" << endl;
```

```
                    delay(1);
                    break;
                }
            }
        }

private:
    void delay(int seconds) {
        this_thread::sleep_for(chrono::seconds(seconds));
    }

    void clearScreen() {
#ifdef _WIN32
        system("cls");
#else
        system("clear");
#endif
    }

    void displayWelcomeMessage() {
                                                                                    cout            <<
">>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
>>>>>>>>>>>>>>>>>>>>>>>>>>>>" << endl;
                cout  <<  "'                                                                    WELCOME  TO
'" << endl;
```

```
cout << "'                    SMART TRAFFIC MANAGEMENT SYSTEM                    '" << endl;

cout << "'          Press Your Option :-                    '" << endl;

cout << "'                    1. Record of Vehicles                    '" << endl;

cout << "'                    2. Record of Challan                    '" << endl;

cout << "'                    3. Search the Record of Vehicles                    '" << endl;

cout << "'                    4. Traffic Control Booths                    '" << endl;

cout << "'                    5. Control the Traffic                    '" << endl;

cout << "'                    6. Help !                    '" << endl;

cout << "'          Enter your choice __                    '" << endl;

cout << ">>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>" << endl;

}


void displayVehicleRecords() {

    clearScreen();

    cout << "Record of Vehicles:\n" << endl;


    cout << "Toyota Corolla - Sedan, 2021, White\nRegistration Number: ABC1234\nOwner: Aashutosh K. Das\n" << endl;
```

```
        cout << "Honda Civic - Sedan, 2020, Black\nRegistration Number: XYZ5678\nOwner: Nikhil K. Sah\n" << endl;



        cout << "Maruti Suzuki Swift - Hatchback, 2021, White\nRegistration Number: IND001\nOwner: Rajesh Kumar\n" << endl;

          cout << "Hyundai Creta - SUV, 2020, Silver\nRegistration Number: IND002\nOwner: Priya Mehta\n" << endl;

        cout << "Tata Nexon - SUV, 2022, Blue\nRegistration Number: IND003\nOwner: Ramesh Singh\n" << endl;

       cout << "Mahindra Thar - SUV, 2021, Black\nRegistration Number: IND004\nOwner: Anita Patel\n" << endl;

           cout << "Honda City - Sedan, 2019, Grey\nRegistration Number: IND005\nOwner: Vikram Sharma\n" << endl;

       cout << "Kia Seltos - SUV, 2021, Red\nRegistration Number: IND006\nOwner: Sanya Kapoor\n" << endl;

          cout << "Toyota Fortuner - SUV, 2022, White\nRegistration Number: IND007\nOwner: Arjun Verma\n" << endl;

         cout << "Hyundai i20 - Hatchback, 2020, Black\nRegistration Number: IND008\nOwner: Shruti Iyer\n" << endl;

         cout << "Tata Altroz - Hatchback, 2022, Gold\nRegistration Number: IND009\nOwner: Devansh Tripathi\n" << endl;

        cout << "Maruti Suzuki Baleno - Hatchback, 2019, Blue\nRegistration Number: IND010\nOwner: Manish Gupta\n" << endl;



      delay(3);

   }



   void displayChallanRecords() {

      clearScreen();
```

```
    cout << "Select City for Challan Records:" << endl;
    cout << "1. Jalandhar\n2. Amritsar\n3. Chandigarh\n4. Delhi\n5. Vijayawada\n6. Mangalagiri\nEnter your choice: ";
    int choice;
    cin >> choice;

    switch (choice) {
        case 1:
            showCityChallanRecords("Jalandhar");
            break;
        case 2:
            showCityChallanRecords("Amritsar");
            break;
        case 3:
            showCityChallanRecords("Chandigarh");
            break;
        case 4:
            showCityChallanRecords("Delhi");
            break;
        case 5:
            showCityChallanRecords("Vijayawada");
            break;
        case 6:
            showCityChallanRecords("Mangalagiri");
            break;
```

```
        default:
            cout << "Invalid choice!" << endl;
            delay(2);
    }
}

void showCityChallanRecords(const string& city) {
    clearScreen();
    cout << "Challan Records in " << city << ":\n" << endl;

    if (city == "Jalandhar") {
        cout << "Vehicle: Toyota Corolla\nChallan Number: CHL001234\nDate of Issue: October 5, 2024\nViolation: Speeding\nFine Amount: ₹500\n" << endl;
        cout << "Vehicle: Honda Civic\nChallan Number: CHL002345\nDate of Issue: October 7, 2024\nViolation: Illegal Parking\nFine Amount: ₹300\n" << endl;
        cout << "Vehicle: Ford F-150\nChallan Number: CHL003456\nDate of Issue: October 10, 2024\nViolation: Not wearing seatbelt\nFine Amount: ₹500\n" << endl;
        cout << "Vehicle: Chevrolet Malibu\nChallan Number: CHL004567\nDate of Issue: October 12, 2024\nViolation: Wrong side driving\nFine Amount: ₹700\n" << endl;
    } else if (city == "Amritsar") {
        cout << "Vehicle: Honda Accord\nChallan Number: AMR001234\nDate of Issue: October 3, 2024\nViolation: Speeding\nFine Amount: ₹500\n" << endl;
        cout << "Vehicle: Maruti Suzuki Swift\nChallan Number: AMR002345\nDate of Issue: October 5, 2024\nViolation: Illegal Parking\nFine Amount: ₹300\n" << endl;
        cout << "Vehicle: Hyundai Creta\nChallan Number: AMR003456\nDate of Issue: October 8, 2024\nViolation: Not wearing seatbelt\nFine Amount: ₹500\n" << endl;
        cout << "Vehicle: Chevrolet Cruze\nChallan Number: AMR004567\nDate of Issue: October 12, 2024\nViolation: Wrong side driving\nFine Amount: ₹700\n" << endl;
```

```
} else if (city == "Chandigarh") {

        cout << "Vehicle: Honda City\nChallan Number: CHD001234\nDate of Issue: October 4, 2024\nViolation: Speeding\nFine Amount: ₹500\n" << endl;

        cout << "Vehicle: Toyota Fortuner\nChallan Number: CHD002345\nDate of Issue: October 6, 2024\nViolation: Illegal Parking\nFine Amount: ₹300\n" << endl;

        cout << "Vehicle: BMW 5 Series\nChallan Number: CHD003456\nDate of Issue: October 10, 2024\nViolation: Not wearing seatbelt\nFine Amount: ₹500\n" << endl;

        cout << "Vehicle: Audi A4\nChallan Number: CHD004567\nDate of Issue: October 12, 2024\nViolation: Wrong side driving\nFine Amount: ₹700\n" << endl;

} else if (city == "Delhi") {

        cout << "Vehicle: Mahindra Thar\nChallan Number: DL001234\nDate of Issue: October 8, 2024\nViolation: Speeding\nFine Amount: ₹700\n" << endl;

        cout << "Vehicle: Tata Nexon\nChallan Number: DL002345\nDate of Issue: October 10, 2024\nViolation: Illegal Parking\nFine Amount: ₹500\n" << endl;

        cout << "Vehicle: Kia Seltos\nChallan Number: DL003456\nDate of Issue: October 12, 2024\nViolation: Not wearing seatbelt\nFine Amount: ₹300\n" << endl;

        cout << "Vehicle: Maruti Baleno\nChallan Number: DL004567\nDate of Issue: October 15, 2024\nViolation: Jumping red light\nFine Amount: ₹600\n" << endl;

} else if (city == "Vijayawada") {

        cout << "Vehicle: Hyundai Verna\nChallan Number: VJA001234\nDate of Issue: October 8, 2024\nViolation: Speeding\nFine Amount: ₹500\n" << endl;

        cout << "Vehicle: Renault Kwid\nChallan Number: VJA002345\nDate of Issue: October 9, 2024\nViolation: Illegal Parking\nFine Amount: ₹200\n" << endl;

        cout << "Vehicle: Tata Altroz\nChallan Number: VJA003456\nDate of Issue: October 10, 2024\nViolation: Not wearing seatbelt\nFine Amount: ₹500\n" << endl;

        cout << "Vehicle: Honda Amaze\nChallan Number: VJA004567\nDate of Issue: October 12, 2024\nViolation: Wrong side driving\nFine Amount: ₹700\n" << endl;

} else if (city == "Mangalagiri") {

        cout << "Vehicle: Skoda Superb\nChallan Number: MGL001234\nDate of Issue: October 6, 2024\nViolation: Speeding\nFine Amount: ₹600\n" << endl;
```

```
            cout << "Vehicle: Ford Ecosport\nChallan Number: MGL002345\nDate of Issue: October 9, 2024\nViolation: Illegal Parking\nFine Amount: ₹300\n" << endl;

            cout << "Vehicle: Nissan Magnite\nChallan Number: MGL003456\nDate of Issue: October 11, 2024\nViolation: Not wearing seatbelt\nFine Amount: ₹400\n" << endl;

            cout << "Vehicle: Toyota Camry\nChallan Number: MGL004567\nDate of Issue: October 14, 2024\nViolation: Wrong side driving\nFine Amount: ₹750\n" << endl;

        }

        delay(3);

    }

    void vehSearch() {

        clearScreen();

        cout << "Enter Vehicle Registration Number to Search: ";

        string regNumber;

        cin >> regNumber;

        cout << "Searching records for vehicle registration number: " << regNumber << "...\n" << endl;

            cout << "Vehicle Found:\nToyota Corolla - Sedan, 2021, White\nOwner: Bhupendra \nChallans: 1\nTotal Fine: ₹500\n" << endl;

        delay(3);

    }



    void trafContBooth() {

        clearScreen();

        cout << "Select City to Display Traffic Control Booths:" << endl;

        cout << "1. Jalandhar\n2. Amritsar\n3. Chandigarh\n4. Delhi\n5. Vijayawada\n6. Mangalagiri\nEnter your choice: ";

        int choice;

        cin >> choice;
```

```
switch (choice) {
    case 1:
        showBoothsInCity("Jalandhar");
        break;
    case 2:
        showBoothsInCity("Amritsar");
        break;
    case 3:
        showBoothsInCity("Chandigarh");
        break;
    case 4:
        showBoothsInCity("Delhi");
        break;
    case 5:
        showBoothsInCity("Vijayawada");
        break;
    case 6:
        showBoothsInCity("Mangalagiri");
        break;
    default:
        cout << "Invalid choice!" << endl;
        delay(2);
}
```

```
}

void showBoothsInCity(const string& city) {
    clearScreen();
    cout << "Traffic Control Booths in " << city << ":\n" << endl;
    if (city == "Jalandhar") {
        cout << "Guru Nanak Mission Chowk - Head: Inspector Rajesh Singh\n"
             << "Model Town Market - Head: Inspector Amrit Kaur\n"
             << "Jyoti Chowk - Head: Inspector Mohan Preet\n"
             << "... [add other locations]\n";
    } else if (city == "Amritsar") {
        cout << "Golden Temple Entrance - Head: Inspector Harman Singh\n"
             << "Amritsar Railway Station - Head: Inspector Randeep Bajwa\n"
             << "Hall Bazaar - Head: Inspector Surinderpal Kaur\n"
             << "... [add other locations]\n";
    } else if (city == "Chandigarh") {
        cout << "Sector 17 Plaza - Head: Inspector Rahul Sharma\n"
             << "ISBT Sector 43 - Head: Inspector Seema Kapoor\n"
             << "Elante Mall Junction - Head: Inspector Manish Sood\n"
             << "... [add other locations]\n";
    } else if (city == "Delhi") {
        cout << "Connaught Place - Head: Inspector Ravi Kumar\n"
             << "Rajiv Chowk Metro Station - Head: Inspector Neeraj Malhotra\n"
             << "Karol Bagh Market - Head: Inspector Priya Shastri\n"
```

```
            << "... [add other locations]\n";
    } else if (city == "Vijayawada") {
        cout << "Benz Circle Junction - Head: Inspector Suresh Babu\n"
            << "Eluru Road - Head: Inspector Anitha Reddy\n"
            << "Gandhi Hill View Point - Head: Inspector Lakshmi Narayan\n"
            << "... [add other locations]\n";

    }
    delay(5);
}

void controlTraffic() {
    clearScreen();
    cout << "Controlling traffic in real-time..." << endl;
    TrafficMonitoringSystem monitoringSystem;
    monitoringSystem.addCamera("Main Street");
    monitoringSystem.addCamera("Central Avenue");
    monitoringSystem.startMonitoring();
    delay(3);
}

void helpInfo() {
    clearScreen();
    cout << "Smart Traffic Management System Help Info:\n" << endl;
```

```
        cout << "1. **Record of Vehicles**: View details of vehicles including make, model, and owner's name.\n";

        cout << "2. **Record of Challan**: View challan records based on city selection. See details of fines issued for traffic violations.\n";

        cout << "3. **Search Vehicle Records**: Search for specific vehicle records by entering the registration number.\n";

        cout << "4. **Traffic Control Booths**: Displays traffic control booth locations and head officers for different cities.\n";

        cout << "5. **Control the Traffic**: Activates real-time traffic monitoring with automated accident detection.\n";

        cout << "6. **Helpline Information And Nearby Hospitals**:\n";



        while (true) {

            cout << ">>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>" << endl;

            cout << "*                                        * Helpline Information And Nearby Hospitals *
*" << endl;

            cout << "*                                        Press Your Option :-
*" << endl;

            cout << "*                                        1. Helpline Number
*" << endl;

            cout << "*                                        2. Hospitals in Jalandhar
*" << endl;

            cout << "*                                        3. Hospitals in Amritsar
*" << endl;

            cout << "*                                        4. Hospitals in Chandigarh
*" << endl;

            cout << "*                                        5. Hospitals in Delhi
*" << endl;
```

```
                cout << "*                                          6. Hospitals in Vijayawada
*" << endl;
                cout << "*                                          7. Hospitals in Mangalagiri
*" << endl;
                        cout << "*                                      Enter 0 For Home
*" << endl;
                        cout << "*                                      Enter your choice __
*" << endl;
                                                                              cout        <<
">>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>" << endl;


        int choice;
        cin >> choice;
        if (choice == 0) break;


        switch (choice) {
          case 1:
            displayHelplineNumbers();
            break;
          case 2:
            displayHospitals("Jalandhar");
            break;
          case 3:
            displayHospitals("Amritsar");
            break;
          case 4:
```

```
            displayHospitals("Chandigarh");
            break;
        case 5:
            displayHospitals("Delhi");
            break;
        case 6:
            displayHospitals("Vijayawada");
            break;
        case 7:
            displayHospitals("Mangalagiri");
            break;
        default:
            cout << "Invalid choice!" << endl;
            delay(1);
      }
   }
}

void displayHelplineNumbers() {
   clearScreen();
   cout << "Helpline Number: 123456987" << endl;
   delay(1);
}
```

```
  void displayHospitals(const string& city) {

   clearScreen();

   if (city == "Jalandhar") {

        cout << "Patel Hospital\nAddress: Civil Lines, Jalandhar, Punjab 144001\nEmergency Contact: +91-181-2457540\nWebsite: patelhospital.com\n";

            cout << "Shrimann Superspeciality Hospital\nAddress: Nakodar Rd, Jalandhar, Punjab 144026\nEmergency Contact: +91-181-5017777\nWebsite: shrimannhospitals.com\n";

          cout << "Innocent Hearts Multispeciality Hospital\nAddress: Jalandhar - Nakodar Rd, Adda Khambra, Jalandhar\nEmergency Contact: +91-7527012883\n";

             cout << "Capitol Hospital\nAddress: Village Randhawa Masanda, Kapurthala Road, Jalandhar\nEmergency Contact: +91-181-2366666\nWebsite: capitolhospital.com\n";

       cout << "NHS Hospital\nAddress: 28, G.T. Road, Jalandhar, Punjab 144001\nEmergency Contact: +91-181-5087777\nWebsite: nhshospital.in\n";

   } else if (city == "Amritsar") {

          cout << "Fortis Escorts Hospital\nAddress: Majitha-Verka Bypass Road, Amritsar, Punjab 143001\nEmergency Contact: +91-183-5005002\nWebsite: fortishealthcare.com\n";

        cout << "Amandeep Hospital\nAddress: Model Town, GT Road, Amritsar\nEmergency Contact: +91-186-5099100\nWebsite: amandeephospital.org\n";

           cout << "Healing Touch Hospital\nAddress: Batala Road, Amritsar\nEmergency Contact: +91-183-5000000\nWebsite: healingtouchhospital.org\n";

         cout << "Kakkar Hospital\nAddress: Opp. Khalsa College, G.T. Road, Amritsar\nEmergency Contact: +91-183-2253001\n";

           cout << "Sukh Sagar Hospital\nAddress: Lawrence Road, Amritsar\nEmergency Contact: +91-183-2227075\n";

   } else if (city == "Chandigarh") {

       cout << "PGIMER (Post Graduate Institute of Medical Education & Research)\nAddress: Sector 12, Chandigarh\nEmergency Contact: +91-172-2747585\nWebsite: pgimer.edu.in\n";

        cout << "Landmark Hospital\nAddress: Site No I-II, Opp. Terrace Garden, Sector 33, Chandigarh, 160020\nEmergency Contact: +91-172-4027000\nWebsite: landmarkhospital.in\n";
```

```
        cout << "Max Super Speciality Hospital\nAddress: Mohali, Near Chandigarh\nEmergency Contact: +91-172-6652000\nWebsite: maxhealthcare.in\n\";

            cout << "Indus International Hospital\nAddress: Phase I, Mohali\nEmergency Contact: +91-92163-27027\nWebsite: indushospital.in\n\";

    } else if (city == "Delhi") {

        cout << "AIIMS (All India Institute of Medical Sciences)\nAddress: Ansari Nagar, New Delhi, Delhi 110029\nEmergency Contact: +91-11-26588500\nWebsite: aiims.edu\n\";

            cout << "Fortis Escorts Heart Institute\nAddress: Okhla Road, New Delhi, Delhi 110025\nEmergency Contact: +91-11-47134444\nWebsite: fortishealthcare.com\n\";

        cout << "Sir Ganga Ram Hospital\nAddress: Rajinder Nagar, New Delhi\nEmergency Contact: +91-11-25750000\nWebsite: sgrh.com\n\";

            cout << "BLK Super Speciality Hospital\nAddress: Pusa Road, Delhi\nEmergency Contact: +91-11-30403040\nWebsite: blkhospital.com\n\";

        cout << "Apollo Hospital\nAddress: Mathura Road, Sarita Vihar, New Delhi\nEmergency Contact: +91-11-71791090\nWebsite: apollohospitals.com\n\";

    } else if (city == "Vijayawada") {

            cout << "Andhra Hospitals\nAddress: Bhavanipuram, Vijayawada, Andhra Pradesh 520012\nEmergency Contact: +91-866-2549777\nWebsite: andhrahospitals.org\n\";

        cout << "Manipal Hospitals Vijayawada\nAddress: MG Road, Vijayawada\nEmergency Contact: +91-866-2465555\nWebsite: manipalhospitals.com\n\";

            cout << "Ramesh Hospitals\nAddress: Ring Road, Labbipet, Vijayawada\nEmergency Contact: +91-866-2463333\nWebsite: rameshhospitals.com\n\";

            cout << "Sentini Hospitals\nAddress: Autonagar, Vijayawada\nEmergency Contact: +91-866-2545444\nWebsite: sentinihospitals.com\n\";

            cout << "Siddhartha Hospital\nAddress: Opp. Maris Stella College, Vijayawada\nEmergency Contact: +91-866-2473344\n\";

    } else if (city == "Mangalagiri") {

        cout << "AIIMS Mangalagiri\nAddress: Mangalagiri, Andhra Pradesh 522503\nEmergency Contact: +91-863-2383700\nWebsite: aiimsmangalagiri.edu.in\n\";

            cout << "NRI General Hospital\nAddress: Chinna Kakani, Mangalagiri\nEmergency Contact: +91-863-2213641\nWebsite: nrigeneralhospital.com\n\";
```

```
        cout << "Sree Lakshmi Narayana Hospital\nAddress: Old NH5 Road, Mangalagiri\nEmergency Contact: +91-863-2230345\n";
    }
    delay(3);
}

};

int main() {
    SmartTrafficManagementSystem ob1;
    ob1.welcome();
    return 0;
}
```