TRAFFIC MANAGEMENT SYSTEM
Need For Better Traffic Management

- Increasing vehicle numbers.
- Common flouting of rules.
- Increase in number of accidents.
- To reduce travel time.
Proposed solution

• A tablet application for traffic police on duty.
• Mobile application for all citizens in the city.
• Monitoring website for traffic manager.
• Automated/Dynamic traffic signals.
• Online challan.
• Analytics to predict traffic pattern.
• Everyone connected to synchronize traffic flow.
Architecture and Components

TRAFFIC MANAGEMENT SYSTEM

CONTROL ROOM
- Application Request Manager
- Data Collection
- Data Analysis and Statistics
- Command Layer
- Signal Controller

Data Access Layer
- Data Access & Integration
- Security
- Operations

Be Citizen Police
- Smartphone

Traffic Pattern DB

NewSQL Data Source

Audio Video DB

Manage Traffic Signals
- Take Action on Citizen, Police Request

Traffic Manager

Send/Receive Updates

Send/Receive Reports, Data

Get Details

Update Collection

Emergency Response System

Change Signal State

Raspberry Pi

Destination

Google Traffic API

Request Rapid Passage

Emergency Vehicle

Traffic Police On Duty

Web-API

E-ramai

Maha Samvaardhan

Traffic Police On Duty
Be Citizen Police App

• Mobile application for every citizen in the city with unique identification registration.

• Application features:
  – Input upcoming travel route, and get traffic data to reach the destination efficiently.
  – Report any traffic violations, road blocks, emergency.
  – Contact other citizen police, assistance.

• Problems Solved
  – Control traffic violations.
  – Reduce work load of traffic police.
Traffic Police App

• Tablet application with on duty police login including police details, location.

• Application features:
  – Submit challan against offender.
    • Identify offender from database
    • Add offense details
    • Send a copy of challan to offender to pay the fine (e-mail, sms, etc)
  – Submit run away
  – Contact other nearby police similar to PokemonGo game.

• Problems solved
  – Digitalization of entire traffic management system
  – Curb Corruption.
  – Managing traffic police on duty
Traffic Signals (Controller)

• Traffic signal pole is fitted with controller (e.g. Raspberry pi)

• Every road junction has a controller which co-ordinates between junction traffic signal pole and the main divisional controller.

• Every divisional traffic signal controller is operated by data analysis results of the respective division.

• Every traffic signal on each junctions changes its green signal timing on the basis of traffic on that side of the road

• Problems solved
  – Smooth traffic flow avoiding traffic jams.
Traffic Manager, Analytics, Emergency vehicle

• Traffic Manager can efficiently monitor duty log, location, request, complains of traffic police.

• Traffic Manager can direct police where there is upcoming traffic intimation.

• Provide stats about successfully traffic management in reports to higher authorities based on Analytics.

• Emergency vehicles can reach destination faster.

• Problems solved
  – Providing green corridor to emergency vehicle.
To Control Traffic signal in real time.

Report of high traffic on specific road
• Check for traffic on road from ___ to ___ with start signal id=123
• If Traffic is heavy
  o Check for connecting roads until traffic found low
  o Increase GREEN signal timing on first from last signal &
  o Increase GREEN signal timing of signals from low traffic to high traffic

For Normal day traffic
• Check if any upcoming traffic is updated by citizen police
• Check current traffic status with help of Google Traffic API
• Check for traffic patterns
  e.g. During 9 to 11 am traffic is heavy on roads from Residential areas to Working areas, Schools, etc.
  During 4 to 7 am traffic is heavy on roads from Working areas, Schools, etc. to Residential areas.
  On Weekends traffic is heavy on roads near to Malls, Parks, Theaters, Pubs.
  During festivals certain roads are closed.
Set Traffic signals timings accordingly from control room.
Algorithm To Avoid Traffic Jams

- **For Distributed Mind (Be Ant)**
  - Citizen updates their upcoming travel destination (From-To)
  - Check if others have reported upcoming traffic on way
    - If yes notify the citizen
  - If High number of citizens on same road Potential cause of upcoming traffic Jam.
    - Update citizens coming on the route with alternate paths.
  - If any citizen finds a new alternate path for a heavy traffic road
    - Notify other coming to that road.
User Interface

HOME PAGE

TRAFFIC POLICE ON THE GO

ID: 123456

INSPECTOR NAME

DESIGNATION

HOME | HISTORY | RULES | DUTY LOG

CHALLAN

REPORT RUN

REQUEST FACILITY

PICK UP

CONTACT

REPORT BRIBE

ALERT | MESSAGE | FEEDBACK

230 PM
Implementing This System Will Give Us:

- **SAVE TIME**
- **SAVE FUEL COST**
- **REDUCE CO\textsuperscript{2} EMISSION**
- **REDUCE ACCIDENT**

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<th>2020</th>
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References


THANK YOU