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Vehicle Tracking & Beyond

- "The Smart Tech 2019"

16 May 2019

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About DIMTS

DIMTS – some numbers

1st	• And the only entity to introduce Cluster Scheme in Urban Bus Transport in India
10,00,000	• Cluster buses carrying > 1 m passengers / day
1500+	• ETMs, compatible with **CMC**, deployed in Cluster buses
1,00,000+	• No of Public Service Vehicles (Auto rickshaws and taxis) being tracked and monitored
90,00,000+	• Smart cards for DLs / RCs issued in Delhi
3M / 32	• Designing national solution for security tracking in 3 million vehicle with control centres across 32 cities under Nirbhaya Project (MoRTH)
120+	• No of Parking lots design / O& M (On-street /Off-street /MLP/ Automatic)

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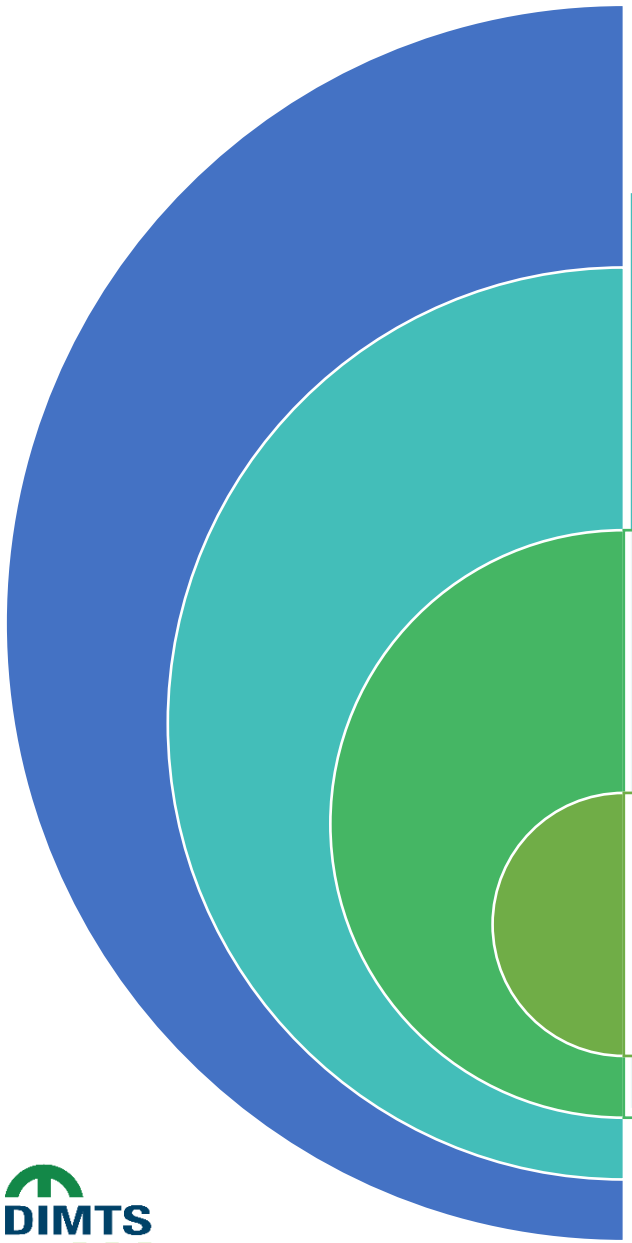
DIMTS – Capabilities in Location based services



Unique IP of Developing and managing AVLS

- Single Device Agnostic Platform

Centralized Monitoring

(Common Control Center)

- 24x7 Real time tracking
- 100000+ Vehicles @ Frequency 10 Sec

Huge Backend Capabilities on Private Cloud

- More than 80 GB data
- More than 150 Million Locations Update
- **Processed…..Everyday**

Leading contributor to GPS Standardization and evaluation parameters

- GPS Standards and evaluation parameters
- More than 40 GPS Models Integrated
- Empanelment Process ongoing

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DIMTS' contribution to the AIS140 standards

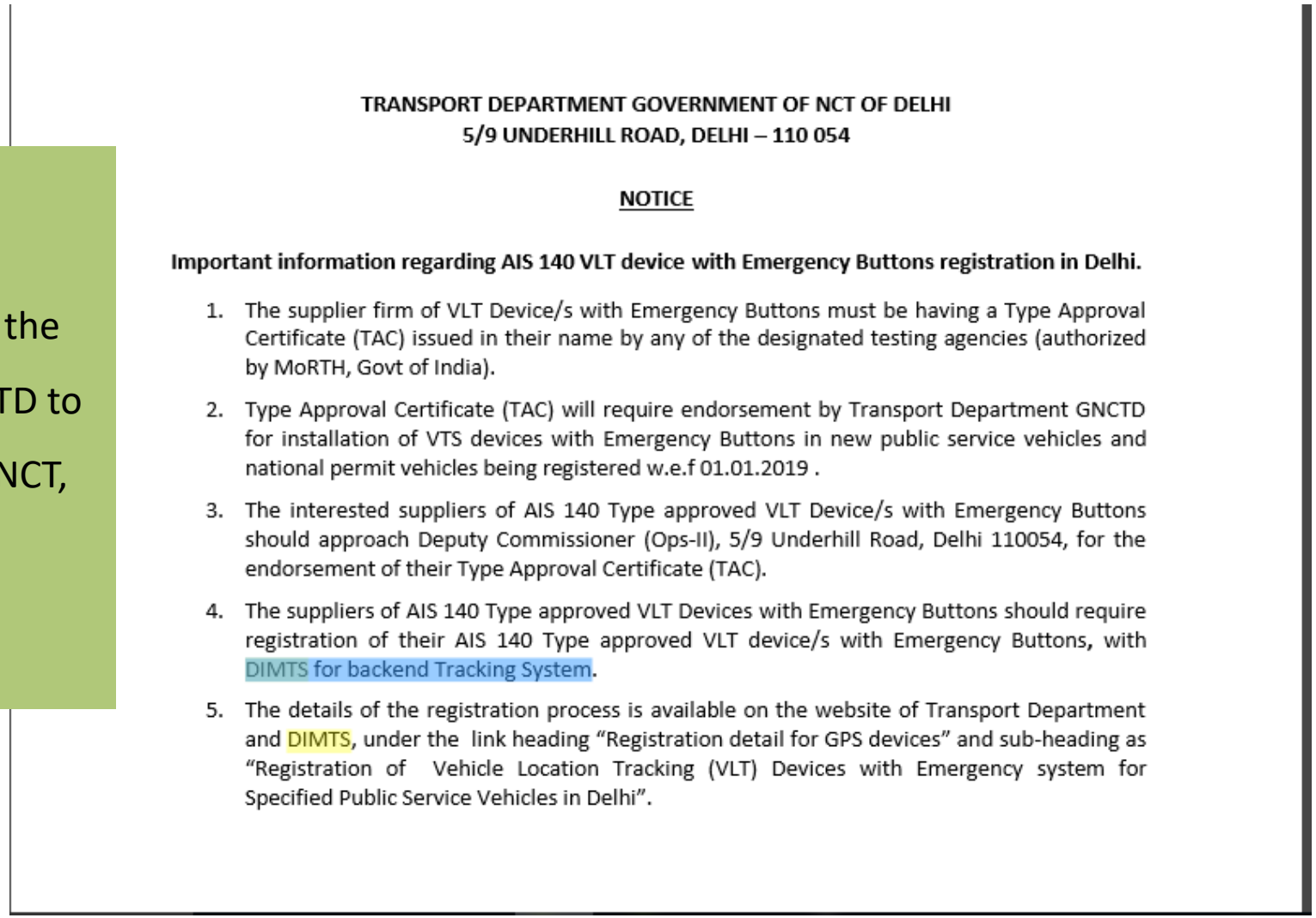
DIMTS' Experts are the convener and members of AISC Constituted by the Government of India.

ANNEXURE D:
(See Introduction)
COMPOSITION OF AISC PANEL *

Name	Organization
Convener	
Mr. Rakesh Jain	Delhi Integrated Multi-Modal Transit System Ltd. (DIMTS)
Members	**Representing**
Mr. Prashant Tiwari /Shri Alok Sethi	Delhi Integrated Multi-Modal Transit System Ltd. (DIMTS)
Mr. A. A. Deshpande/ Mr. M. M. Desai / Mr. K. B. Patil	The Automotive Research Association of India (ARAI)
Director / Mr. Samir Sattigeri /Shri M. M. Pathak	Central Institute of Road Transport (CIRT)
Mr. G. R. M. Rao	Vehicle Research & Dev. Estt. (VRDE)

DIMTS' Responsibility in implementing AIS 140 in Delhi

DIMTS has been entrusted by the Department of Transport, GNCTD to certify AIS 140 devices across NCT, Delhi



TRANSPORT DEPARTMENT GOVERNMENT OF NCT OF DELHI
5/9 UNDERHILL ROAD, DELHI – 110 054

NOTICE

Important information regarding AIS 140 VLT device with Emergency Buttons registration in Delhi.

1. The supplier firm of VLT Device/s with Emergency Buttons must be having a Type Approval Certificate (TAC) issued in their name by any of the designated testing agencies (authorized by MoRTH, Govt of India).
2. Type Approval Certificate (TAC) will require endorsement by Transport Department GNCTD for installation of VTS devices with Emergency Buttons in new public service vehicles and national permit vehicles being registered w.e.f 01.01.2019 .
3. The interested suppliers of AIS 140 Type approved VLT Device/s with Emergency Buttons should approach Deputy Commissioner (Ops-II), 5/9 Underhill Road, Delhi 110054, for the endorsement of their Type Approval Certificate (TAC).
4. The suppliers of AIS 140 Type approved VLT Devices with Emergency Buttons should require registration of their AIS 140 Type approved VLT device/s with Emergency Buttons, with DIMTS for backend Tracking System.
5. The details of the registration process is available on the website of Transport Department and DIMTS, under the link heading "Registration detail for GPS devices" and sub-heading as "Registration of Vehicle Location Tracking (VLT) Devices with Emergency system for Specified Public Service Vehicles in Delhi".

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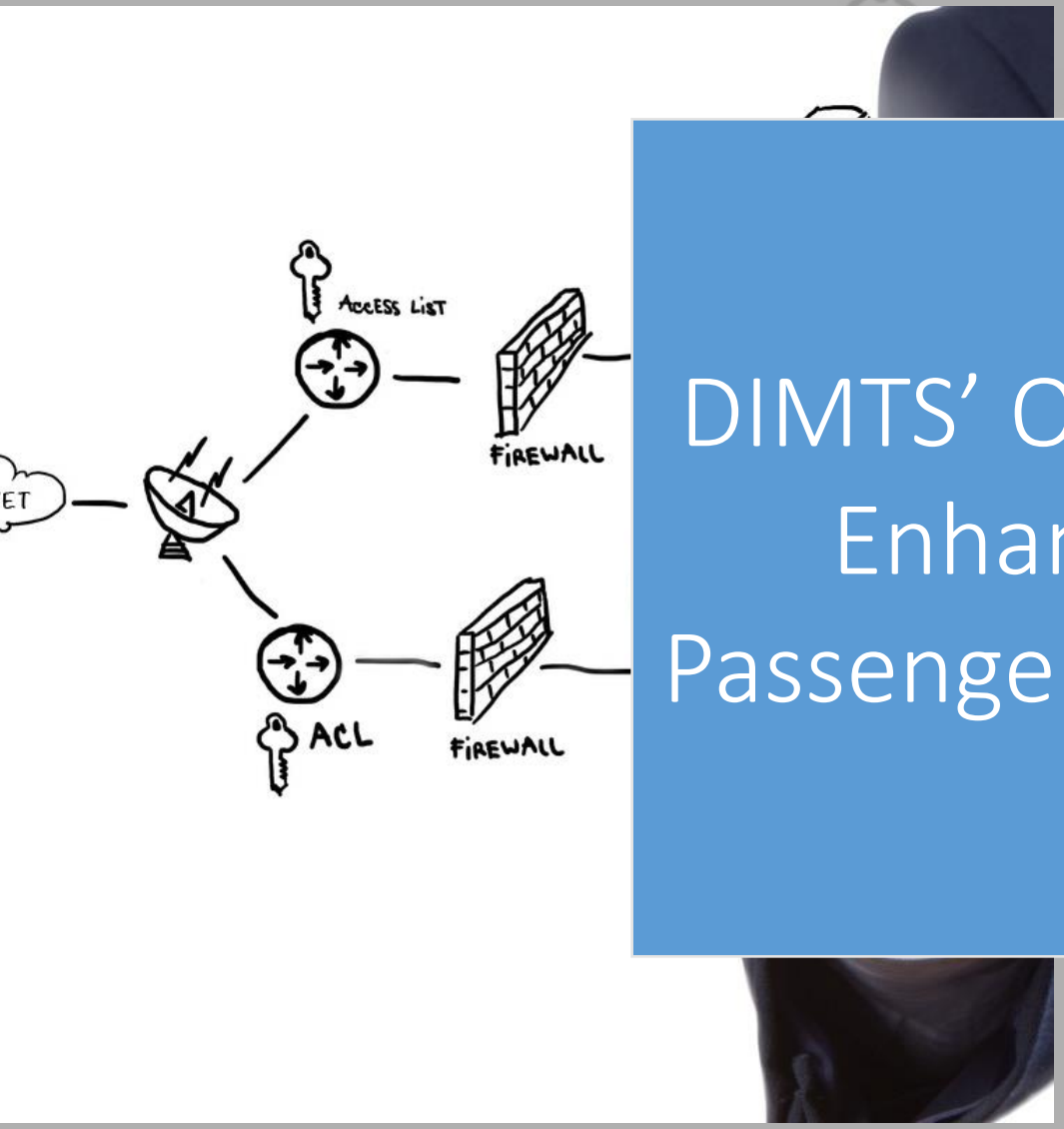

DIMTS' Offerings: Enhancing Passengers' Safety

Passenger registration in mobile app

Passenger's mobile app

Passenger's Registration

One time registration:
1) Name
2) Mobile Number
3) Age Group
4) Gender

Adding Contacts

Add up-to five emergency contacts

Capturing **age group and gender** would help identifying vulnerable groups, e.g. Women and Child. Alert for their panic would be sent with outmost urgency.

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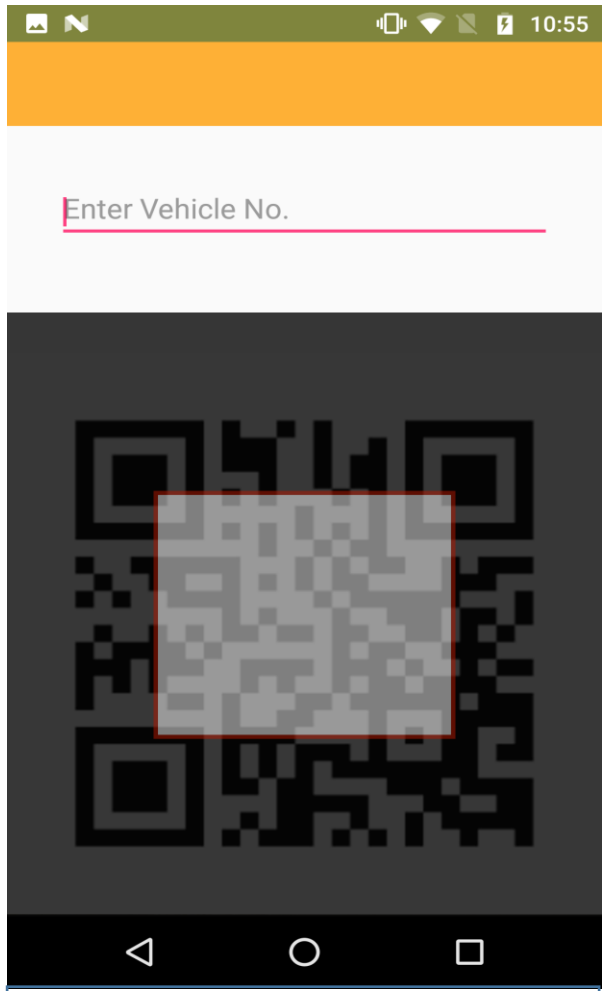
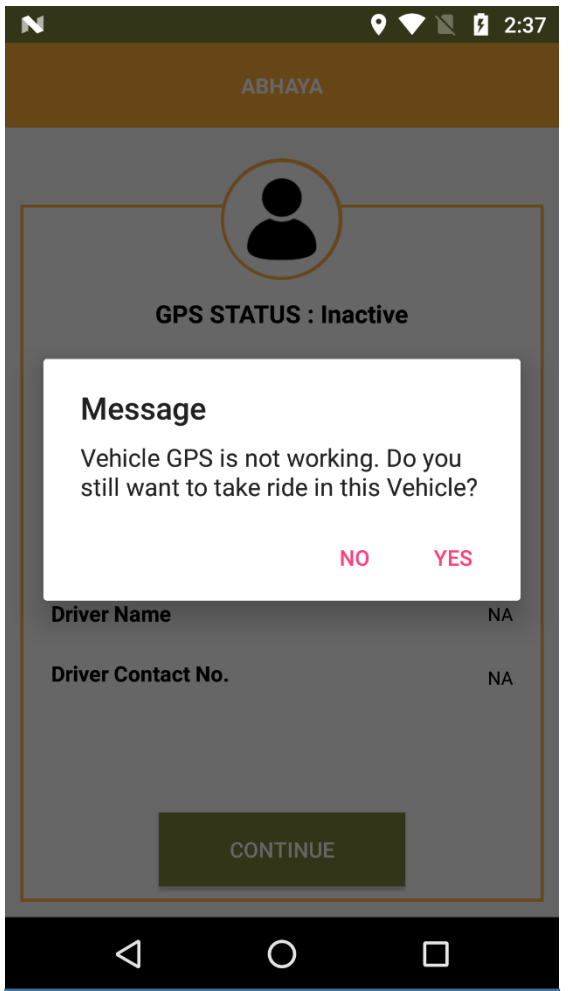
QR code scanning to map passenger, vehicle and driver



Scan QR code or enter Vehicle Number

Advice to passenger if GPS is not working,



Advice to passenger if GPS is not working,

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Passenger onboarding with safety features

Open Mobile App

Scan QR code

Scan QR code sticker pasted on the vehicle
or
Enter the Vehicle number

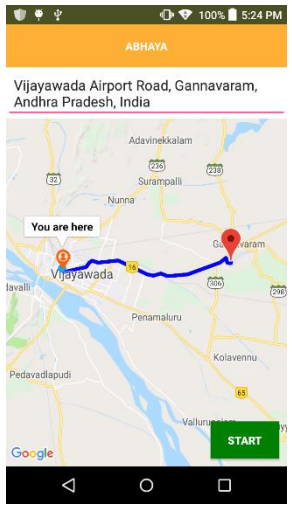
Information Display

Below details will be displayed in the app:

1) GPS details
2) Driver Contact
3) Driver Name
4) Vehicle Reg. No
5) Vehicle Permit Validity
6) Vehicle Owner Name
7) Vehicle Owner Contact number
8) NOT OK to ride in case of

Defining Route

Before boarding, passenger can also define his/her route by choosing destination point.



Start Trip

Start Trip

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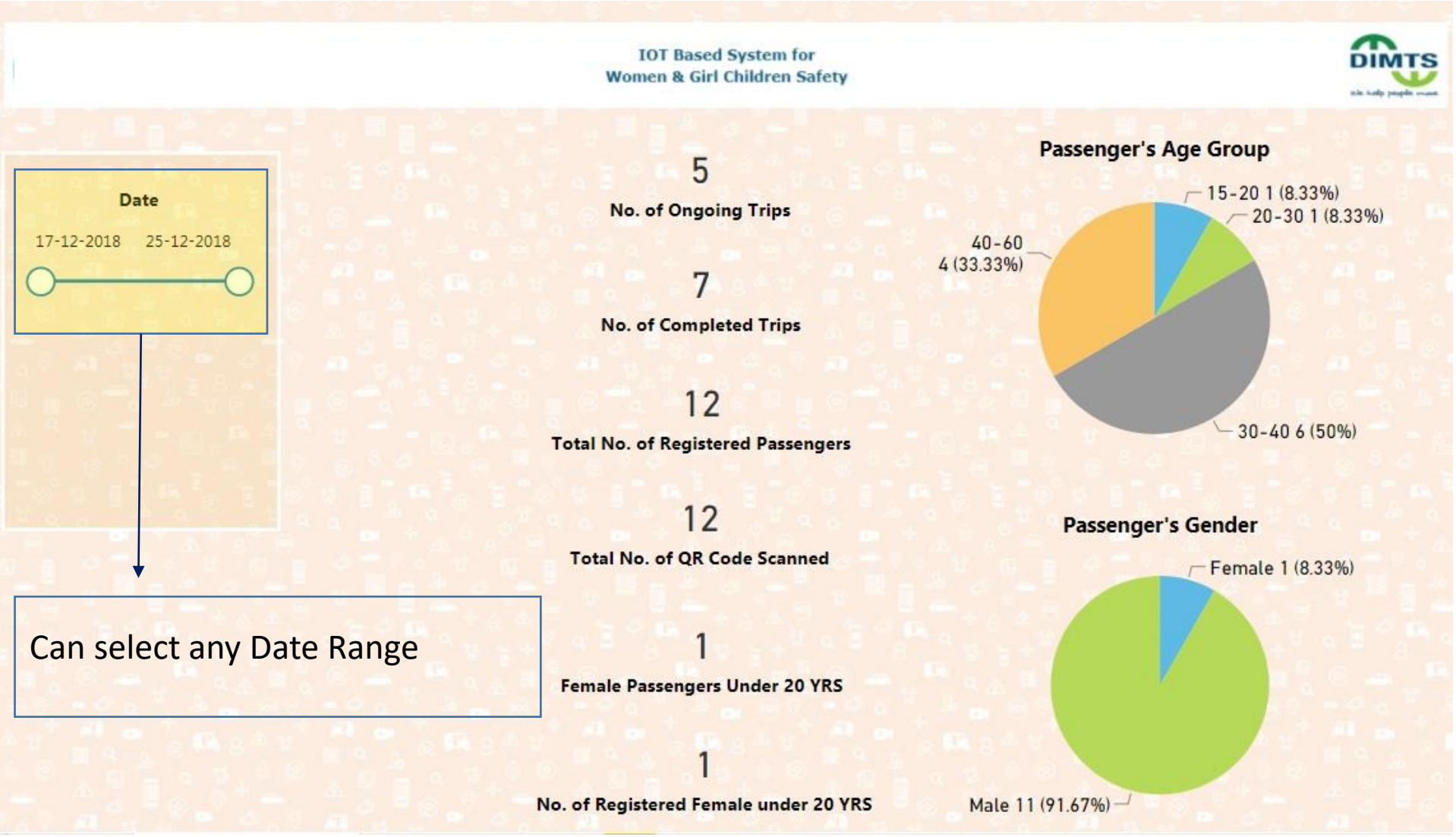
Passengers Demographics and Trip Details

Passenger demographics and Trip Details

This dashboard will display passenger demographics and Trip currently running / ended.

Historical information will also be available here.



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Summary – Safety Measures for Passenger's

- Advisory to passenger if GPS is not working
- Capturing Age Group & Gender to identify vulnerable groups, i.e. Women & Child.
- Option for defining route; to track route deviation if any
- Panic button both on device and mobile app
- Hooter on mobile app in case of panic

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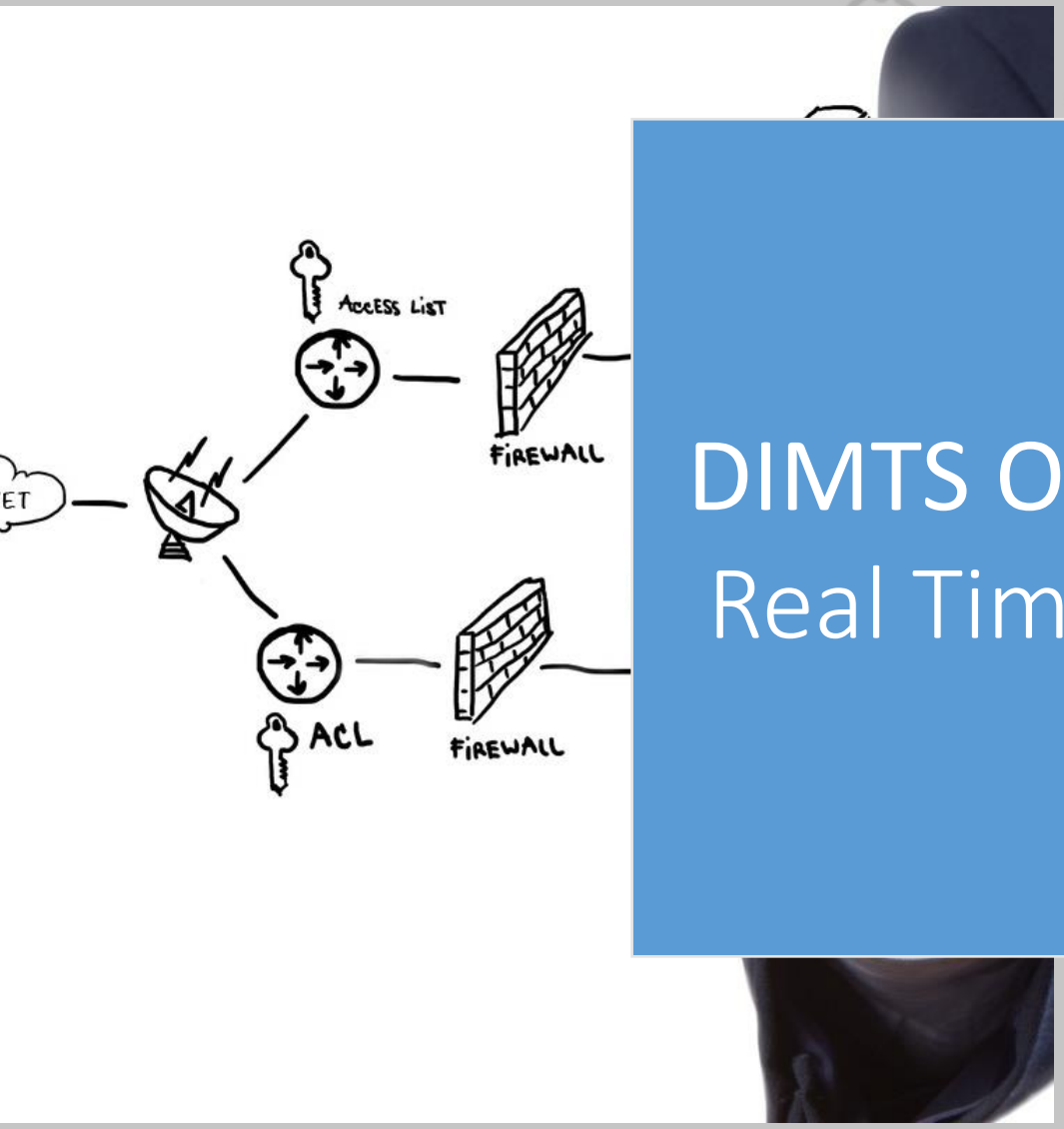
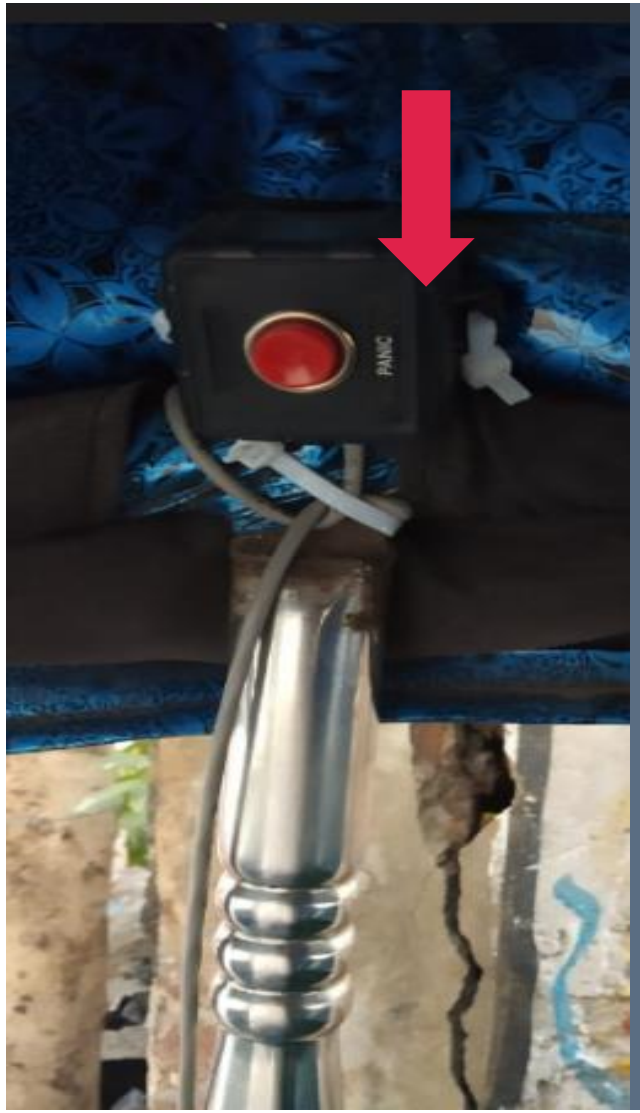


DIMTS Offerings:
Real Time Alerts

Live Panic Alert – From Device and Mobile App



Panic from Device (Fitted in Vehicle)

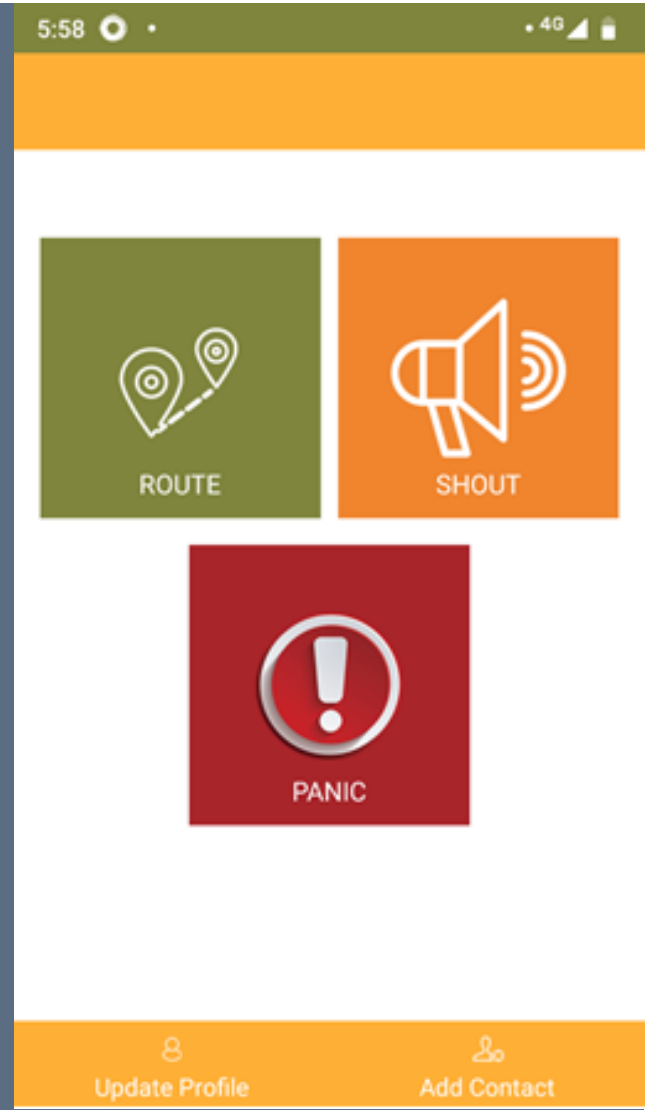
Once device's panic button is pressed, it will start transmitting location data of the vehicle at interval of every 5 Seconds to Control Centre. That would help to furnish:

a) Location of the vehicle on map
b) Driver details (Captured through mobile app/ RFID)

Panic from Passenger Mobile App

1) Panic alert from mobile will be sent to Control Centre and to emergency contacts listed on the mobile app. In addition, passenger mobile app can start sending **video streams** to the control center.

2) "Shout" option on mobile app will trigger a distress alarm, which may attract attention of people present nearby to the auto rickshaw.



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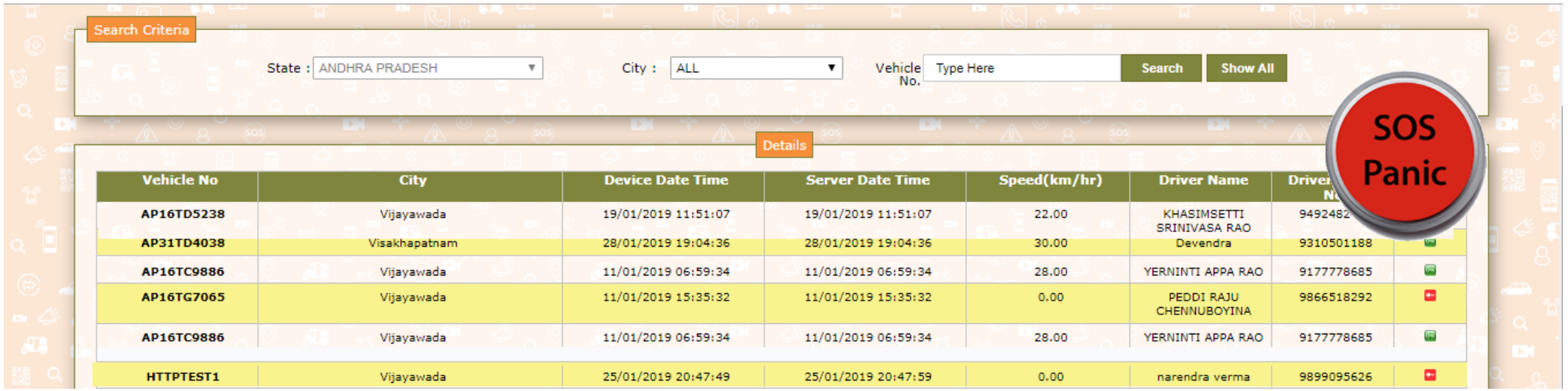
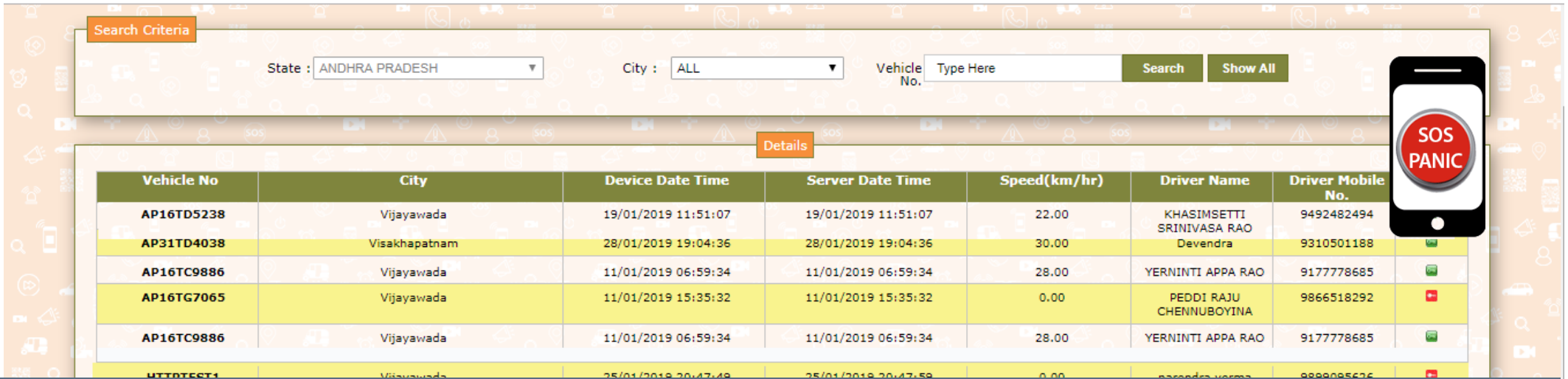
Live Panic Alert (Through Device and Mobile App)



Vehicle No	City	Device Date Time	Server Date Time	Speed(km/hr)	Driver Name	Driver No.
AP16TD5238	Vijayawada	19/01/2019 11:51:07	19/01/2019 11:51:07	22.00	KHASIMSETTI SRINIVASA RAO	9492482
AP31TD4038	Visakhapatnam	28/01/2019 19:04:36	28/01/2019 19:04:36	30.00	Devendra	9310501188
AP16TC9886	Vijayawada	11/01/2019 06:59:34	11/01/2019 06:59:34	28.00	YERNINTI APPA RAO	9177778685
AP16TG7065	Vijayawada	11/01/2019 15:35:32	11/01/2019 15:35:32	0.00	PEDDI RAJU CHENNUBOYINA	9866518292
AP16TC9886	Vijayawada	11/01/2019 06:59:34	11/01/2019 06:59:34	28.00	YERNINTI APPA RAO	9177778685
HTTPTEST1	Vijayawada	25/01/2019 20:47:49	25/01/2019 20:47:59	0.00	narendra verma	9899095626



Vehicle No	City	Device Date Time	Server Date Time	Speed(km/hr)	Driver Name	Driver Mobile No.
AP16TD5238	Vijayawada	19/01/2019 11:51:07	19/01/2019 11:51:07	22.00	KHASIMSETTI SRINIVASA RAO	9492482494
AP31TD4038	Visakhapatnam	28/01/2019 19:04:36	28/01/2019 19:04:36	30.00	Devendra	9310501188
AP16TC9886	Vijayawada	11/01/2019 06:59:34	11/01/2019 06:59:34	28.00	YERNINTI APPA RAO	9177778685
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AP16TC9886	Vijayawada	11/01/2019 06:59:34	11/01/2019 06:59:34	28.00	YERNINTI APPA RAO	9177778685

Even if GPS is not working, Panic alert can be sent to Control Centre through mobile app / GPRS

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Live Panic Alert –Video Streaming

Panic Vehicle Detail

Vehicle No : AP16TD5238

Speed : 21.56

Latitude :16.507541

Longitude : 80.653739

Name :Akilur Rahman

Mobile No. : 9958009640

Gender : Male

Driver Name : KHASIMSETTI SRINIVASA RAO

Driver Mobile No. : 9492482494

Reset Panic

Fire Ignition Off

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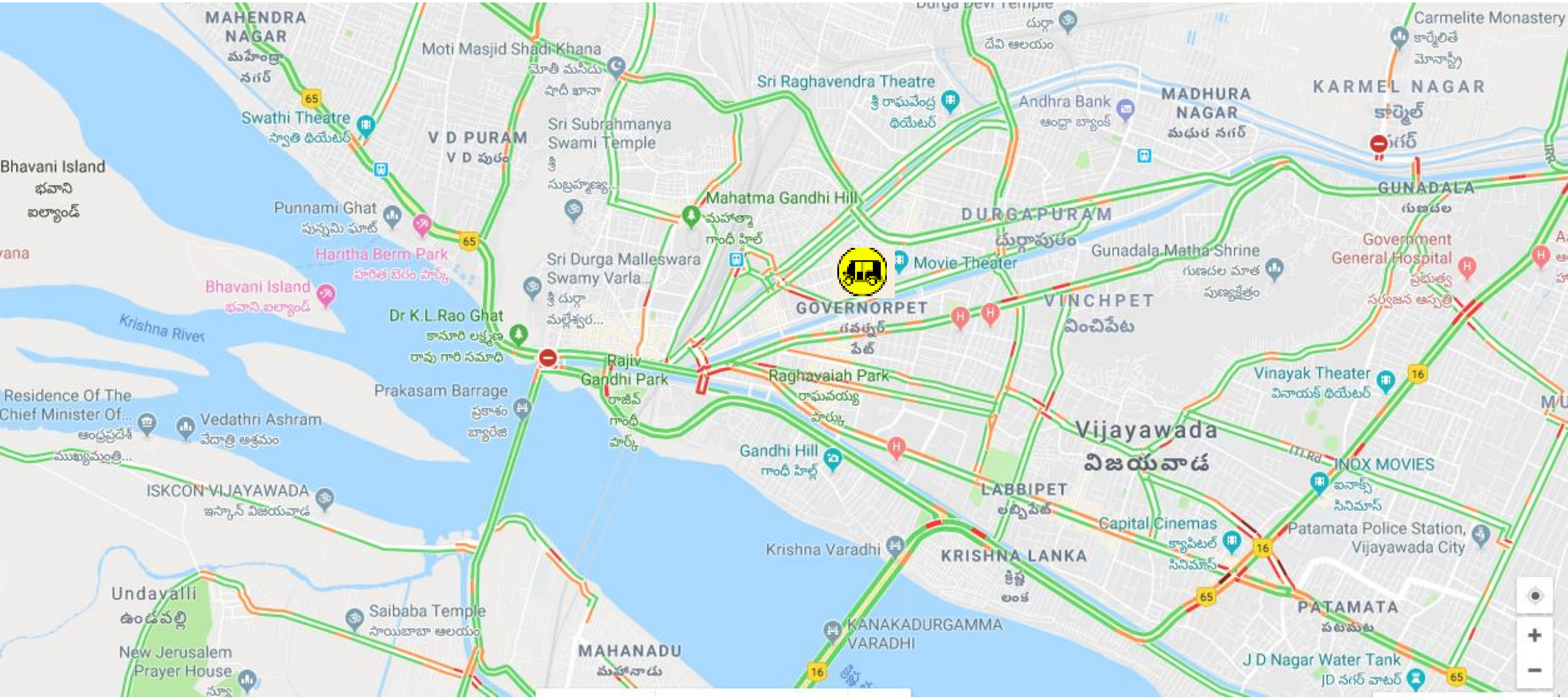
Locating a Vehicle on the Google map



Street View

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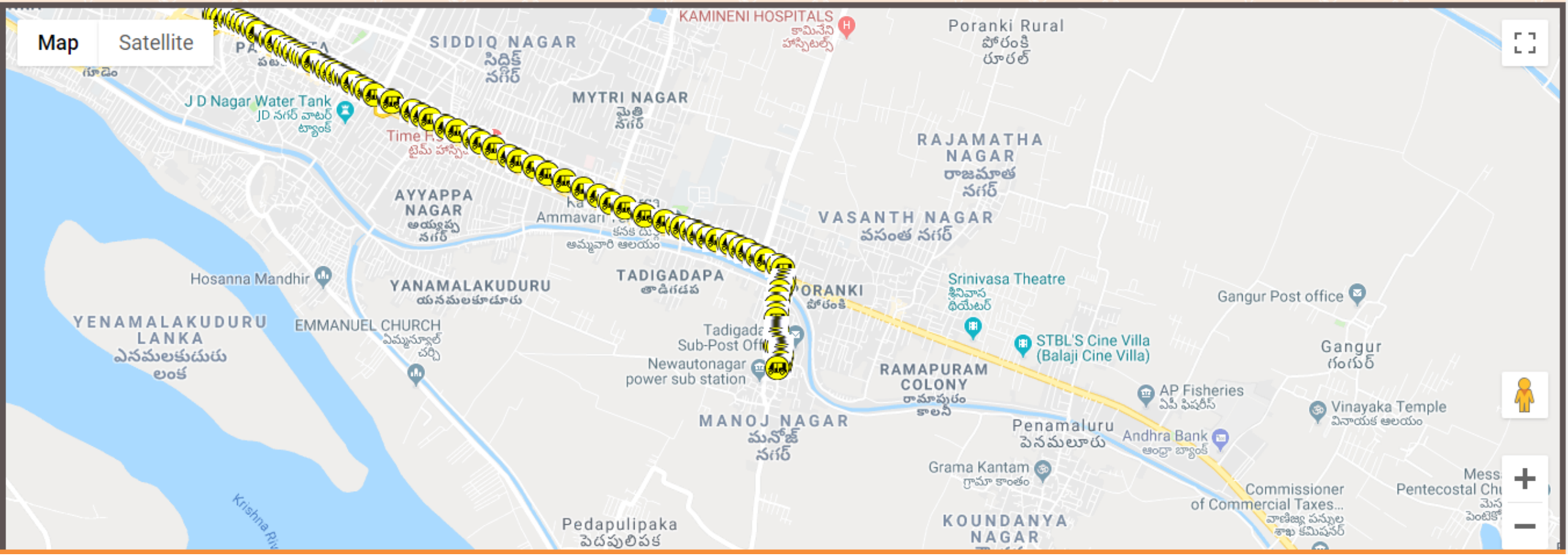
Vehicle Tracking History

My Home | Admin | Report | Tracking | Change Password | || Logout

:: History Tracking

Vehicle history on Map

Vehicle No.: AP16TD5238 From : 19/01/2019 00 00 To : 19/01/2019 23 00 Trips : History



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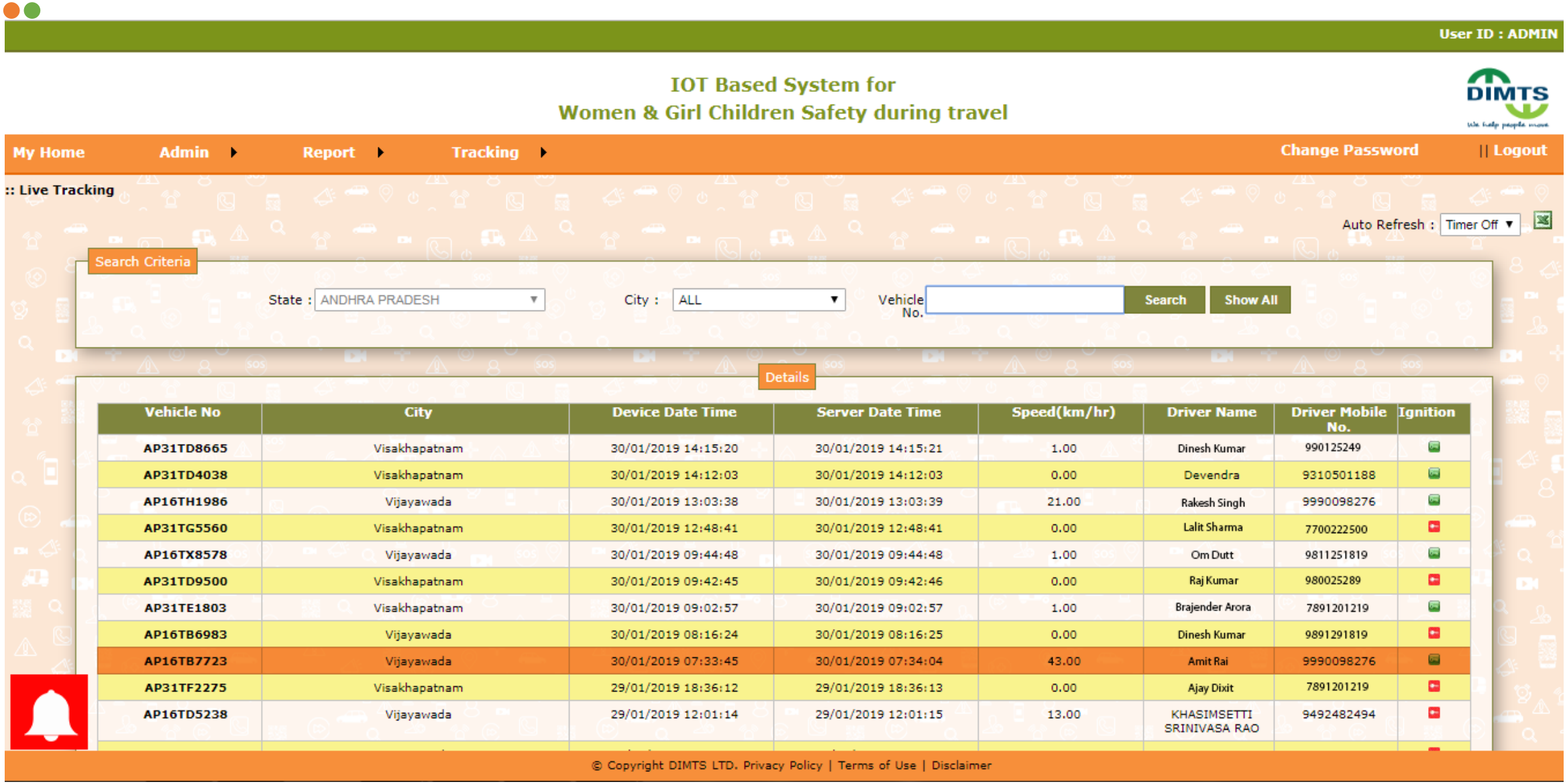
Over speeding Violations



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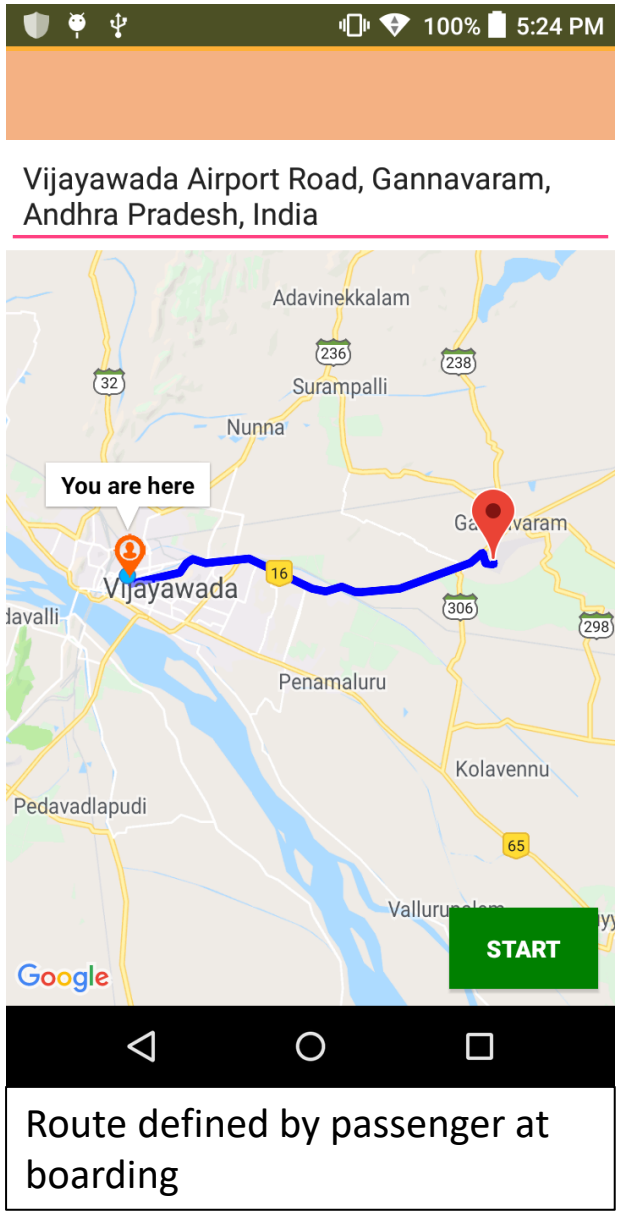
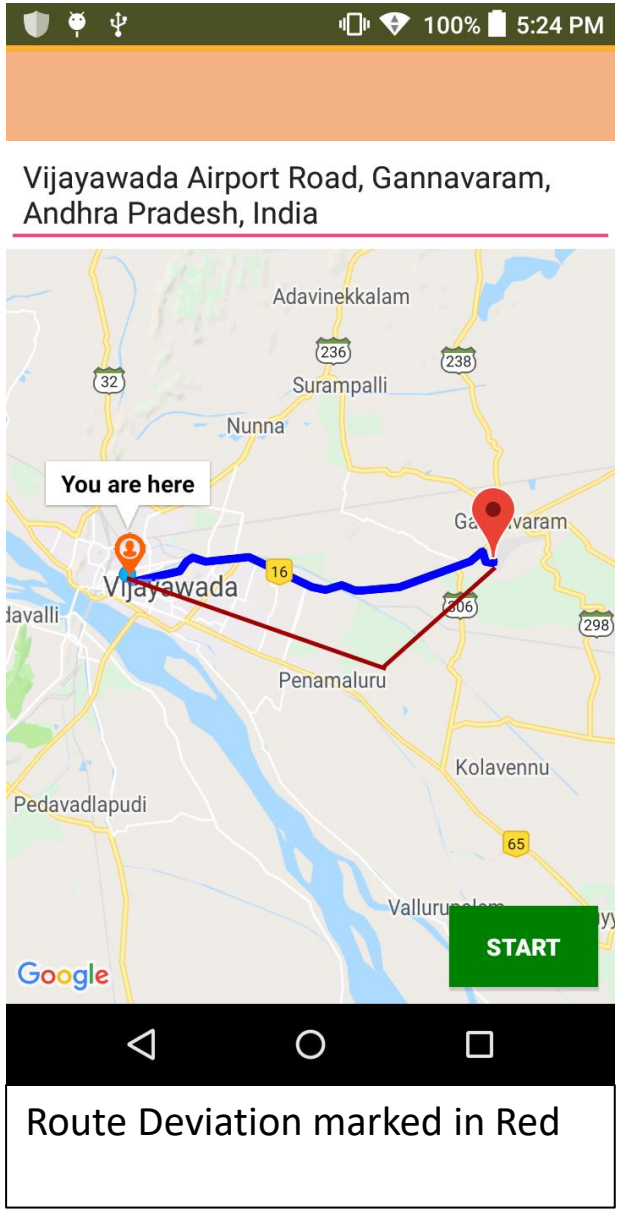
Route Deviation Alert From Mobile App



Route defined by passenger at boarding



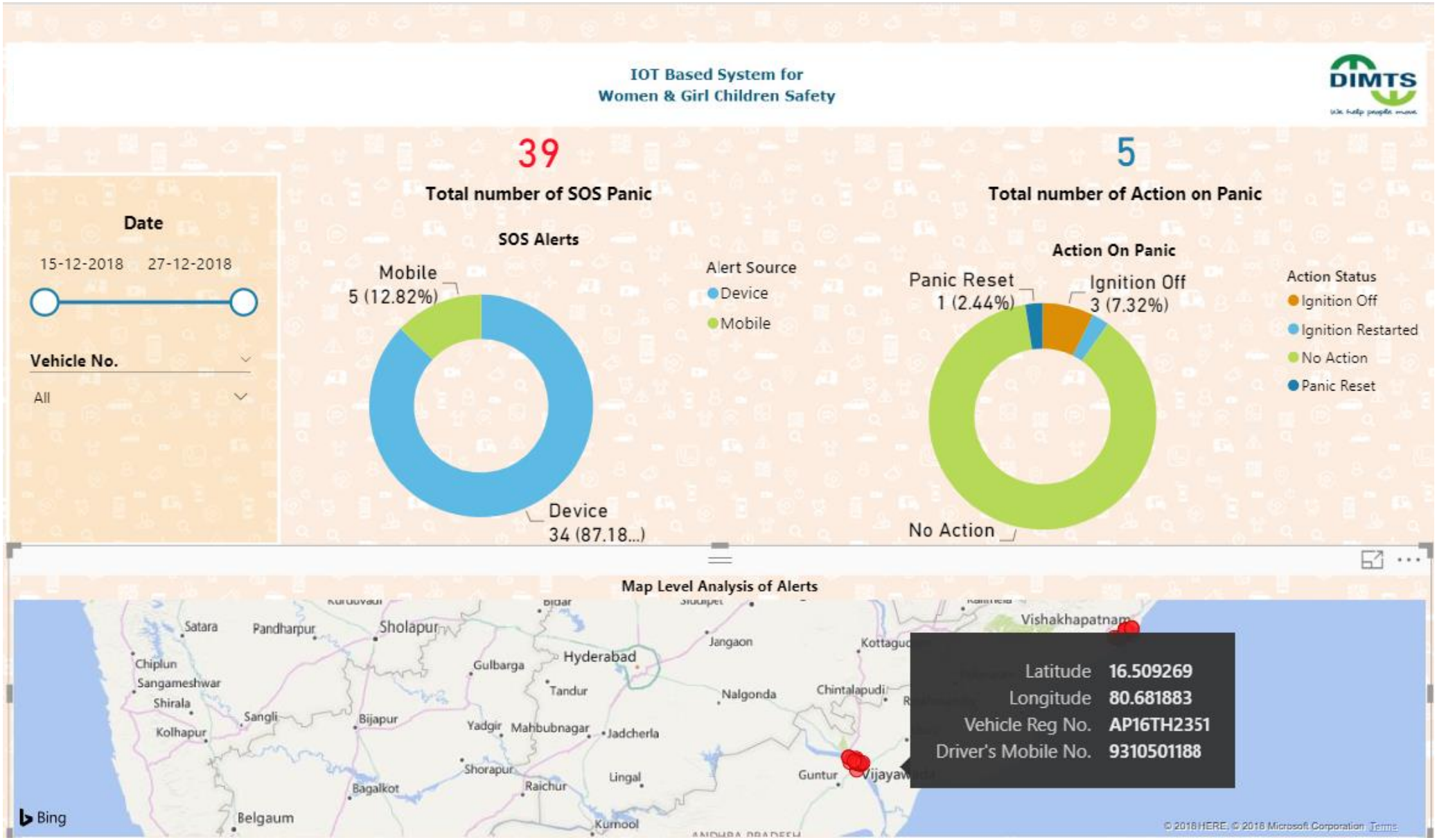
Route Deviation marked in Red

DIMTS Offerings: KPI's & Insights – Real Time Analytics

SOS Dashboard

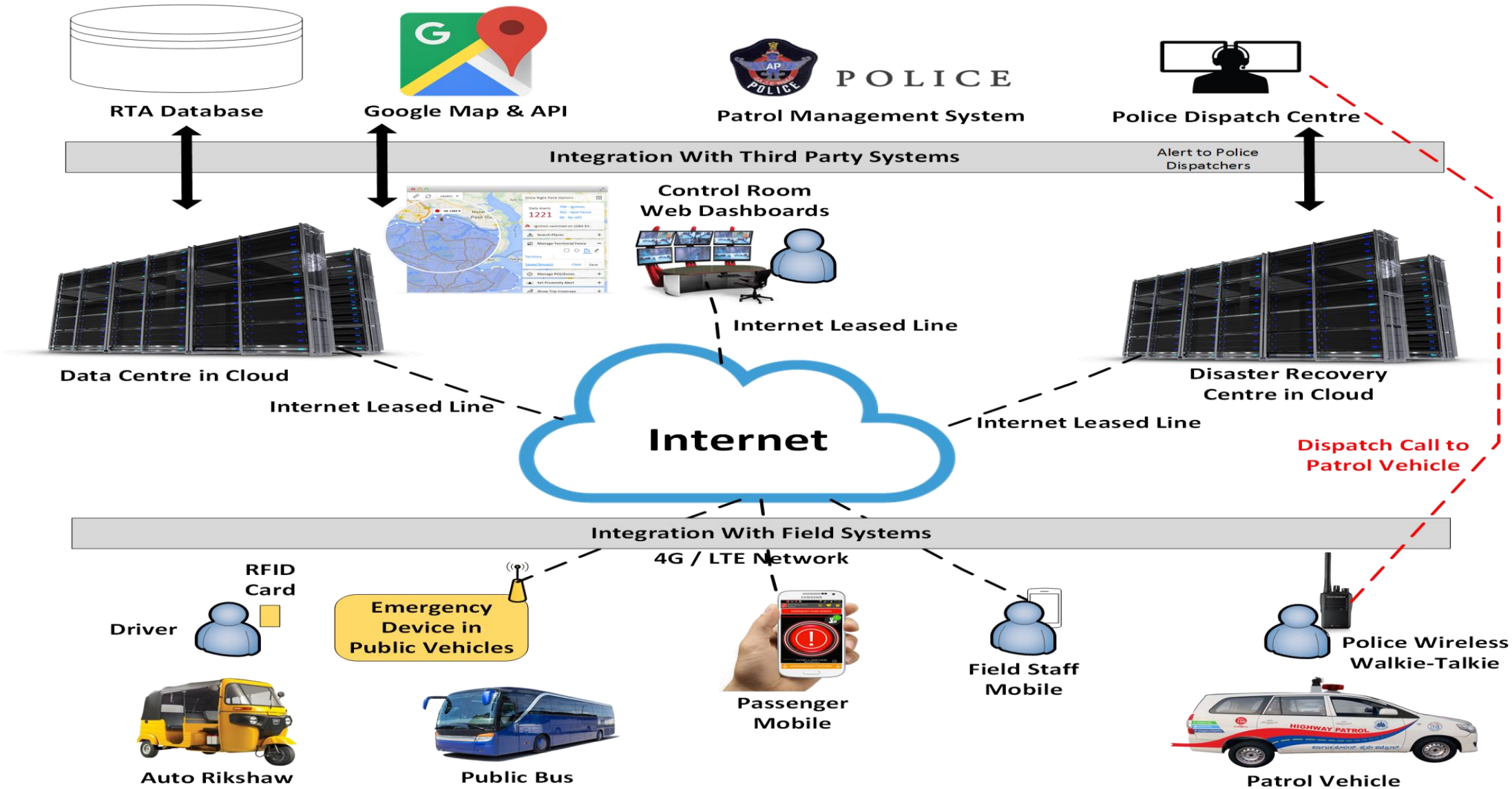
- This dashboard will display Real Time SOS Alerts with Location and Driver contact details on Map.
- This dashboard will also display the action performed on SOS Panics by the command centre.
- Historical information will also be available here.

SOS Dashboard

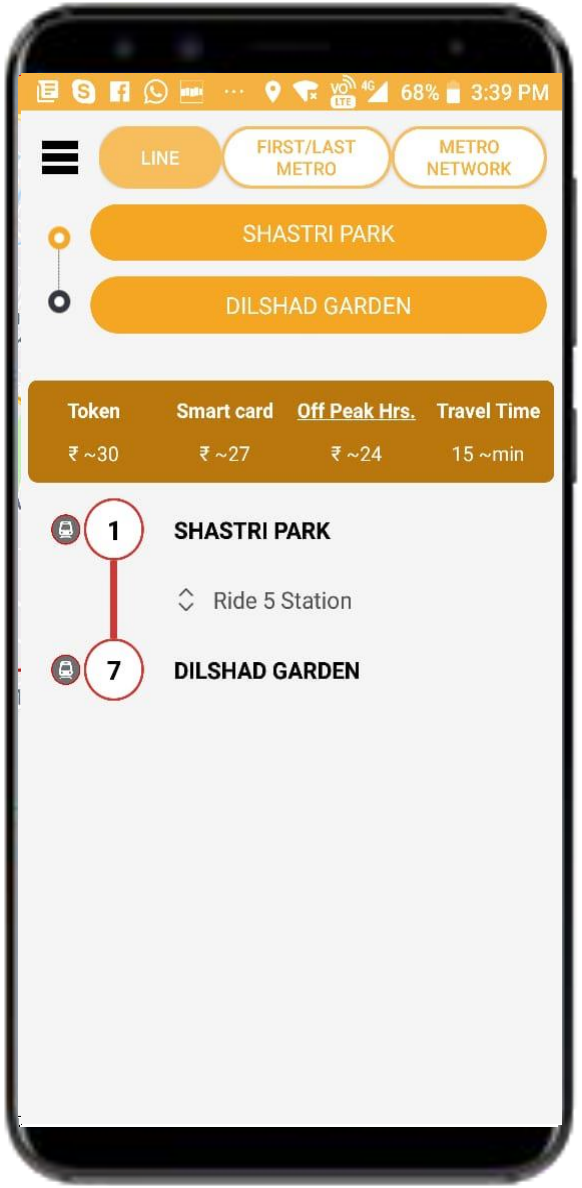


DIMTS Offerings: Solution Capability

Physical Display of System



DIMTS Transit Solution-Mobile Applications



- Empowering commuters with visibility of route and bus access through Trip Planner, nearest bus stop locator, route chart for buses etc. are par for the course.
- Integrated Metro journey planner is convenient.
- Taxi & Auto tracking, and on-call? That is special.

Anomalies and Fraud Analytics

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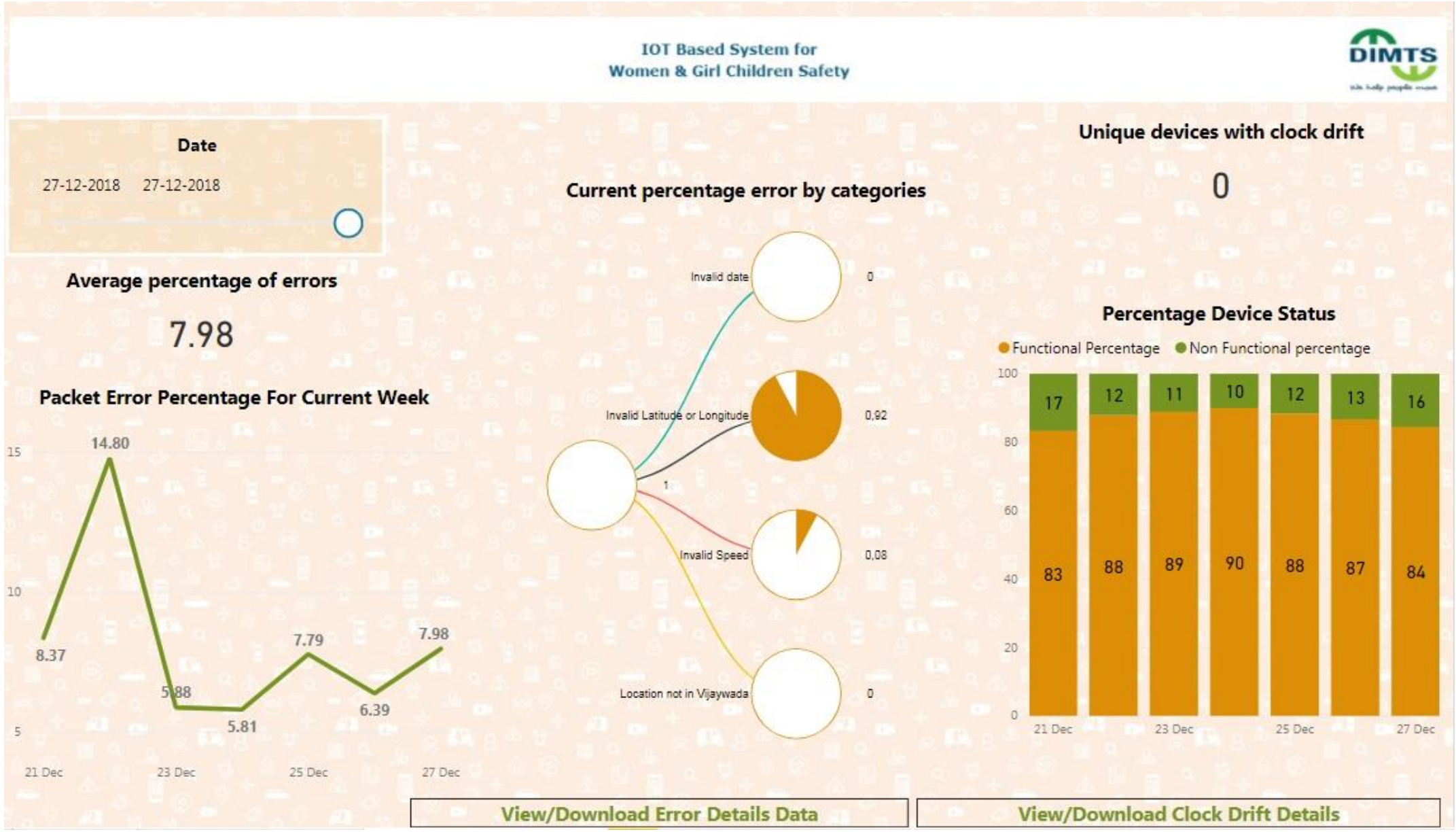
Device Status and Streaming Data Anomalies

- This dashboard will display :
  - Device Status (Functional / Non Functional).
  - Streaming Data Anomalies like Packet Errors and Clock Drift Errors.
  - Historical Information.

Device Status and Streaming Data Anomalies - Current



Predictive Analytics

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Predictive Analytics Model

Predicting Trueness of Panic is based on ML techniques using Classification Algorithms.

SOS button will be colour coded based on the trueness calculated by the Model.

Predicting Trueness of a SOS Panic

- There will be hundreds of thousand vehicles (autos/ taxis/ buses) which will be tracked by the State Transport.
- Each vehicle will have a panic button installed which will be used to generate the SOS.
- Passenger mobile app may also have an option to generate the Panic/ SOS.
- There can be situations when number of Panic call can be huge and tracking each call with same level of quick response can be a challenging task.
- So which Panic call should be responded first ?

- There is no way to make the correct decision every time; however we can try to find a certain level of trueness of each panic based on machine learning techniques, which will learn through historical SOS generated.
- The attributes which can we used in Machine Learning model can be following :-
    1. Passenger Age / Gender
    2. Driver Age / Gender
    3. Location (including Road type)
    4. SOS Timings
    5. Device Vendor
    6. Device or Mobile
    7. Vehicle type / Brand. Etc.

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Predicting Trueness of an SOS Panic

- There can be a **different dedicated** team to handle these high possibility True Panic calls flashed in Red.

- Another team can handle all other call flashed in Orange / Yellow as we can never remove a possibility of error in the Machine learning model.

Key Considerations :-

- This model will need at least 3 to 6 months of Panic / SOS data as learning data which should have correct output attached to it. That means the command centre team should close a panic call with labelling that call as true or fake panic call.
- Fake panic call here means a panic generated via a device defect , accidently by pressing buttons on device or on mobile.
- Additional Possible use cases can be :-
- *To Predict where a passenger will disembark.*
- *To Predict where & when will be Auto scarcity.*
- *To Predict the pattern that how people will move between different areas of the city.*

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Edge Computing

IoT device – Edge Computing Capability

- Harsh braking
- Harsh acceleration
- Rash Driving

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Questions & Answers