

Vashisht 2024: Data Analytic Hackathon

Driving Safety Insights Report

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1. Introduction:

Analysing 1.8 million real-world driving events, this study delves into driver behaviour to improve road safety. By examining data from 130 vehicles over 30 days, including location, speed, and ADAS/DMS alerts (forward collision warnings, drowsiness detection, etc.), the project aims to identify patterns and areas for improvement in driver assistance systems. Beyond the provided data, this analysis incorporates supplemental information like accident blackspots and road networks to create a holistic view. With road safety being a paramount concern globally, this comprehensive analysis aims to offer valuable insights and propose actionable solutions to enhance road safety measures. By scrutinising occurrences of alerts and warnings provided by ADAS and DMS, potential risks and problematic areas on the roads can be identified. Leveraging data-driven approaches, this report contributes to the development of effective strategies and interventions to mitigate road accidents and ensure safer journeys for all road users.

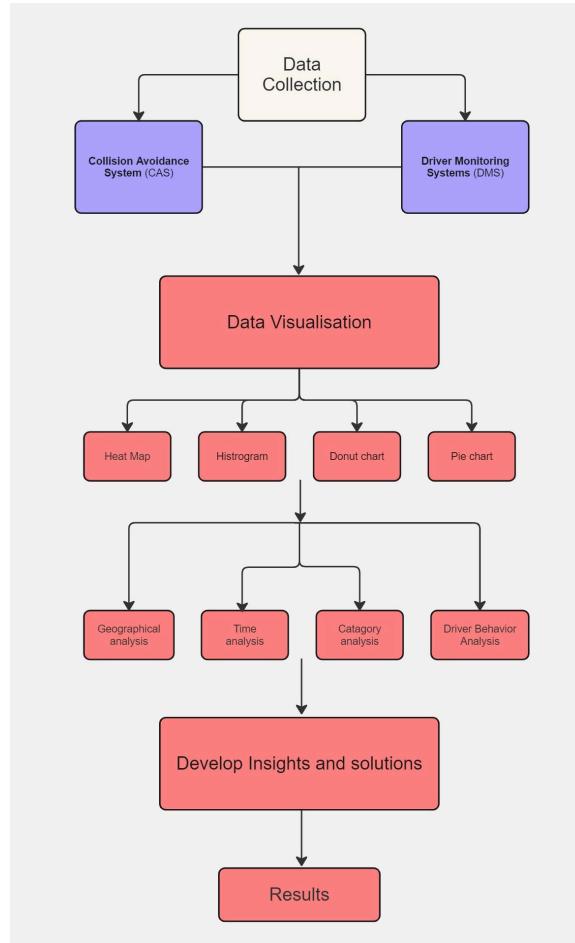
2. Objective:

- Analyze real-world data and visualise patterns to address road safety issues with solutions
- Identify the blackspot location and suggest possible solutions to them for avoidance
- Understanding the geographical and climatic conditions of the place
- Identify the nearby hospitals then provide significant insights accordingly

3. Regions covered:

The alerts that occur in the dataset largely covers the state of Karnataka, Telangana, Andhra Pradesh, and some parts of Tamil Nadu, Kerala, Maharashtra and Odisha. Now, in this report we will deeply look into the alerts and the regions which have the most occurrence.

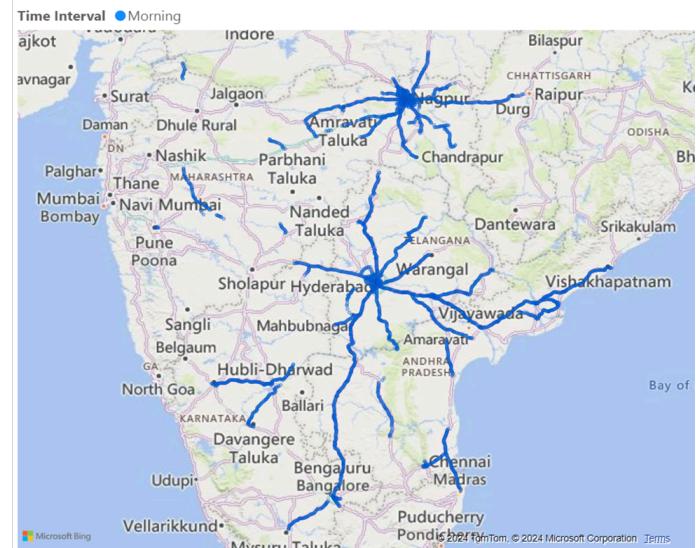
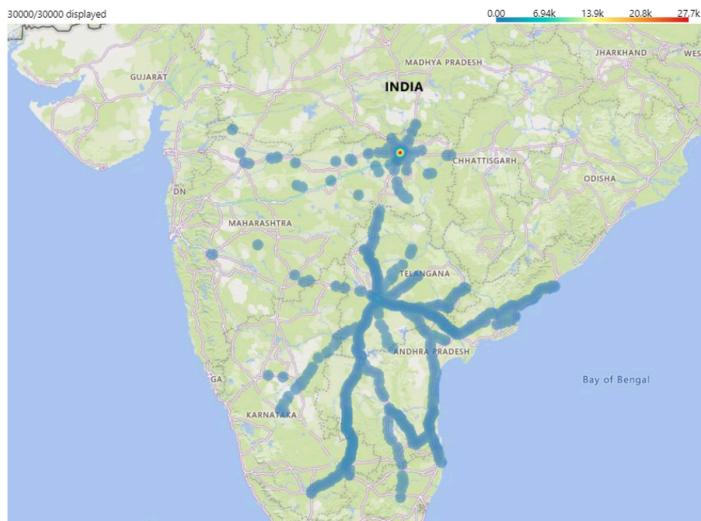
4. Methodology:



5. Identifying High Incidence Zones:

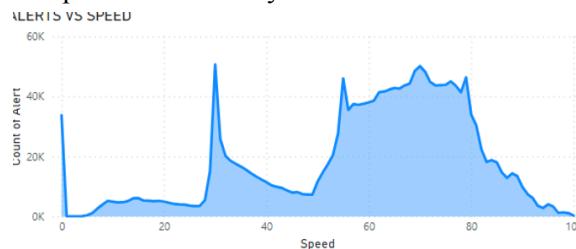
The accident spots obtained after the sorting and analysis of the blackspots are found using the cluster and heat maps. The top 3 spots were chosen in this analysis.

Place	Incident
1. Wardha road - Nagpur	> 30,000
2.HYD to VIZAG highway	>12,000
3.NH43-Karnataka airport road	>10,000

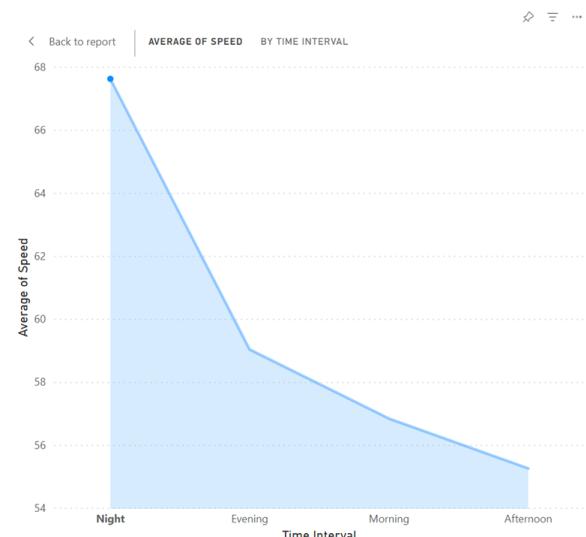
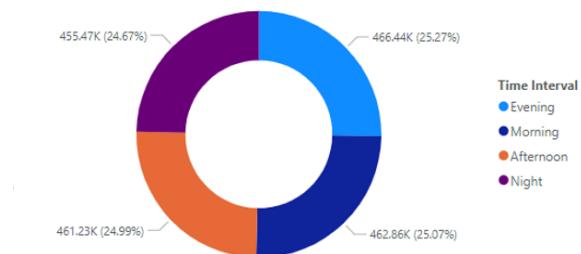


5.1 Time analysis:

We have visualised the time trend using a bunch of line graphs and a donut chart. Using this we can interpret the time analysis.



Count of Alerts by Time Interval



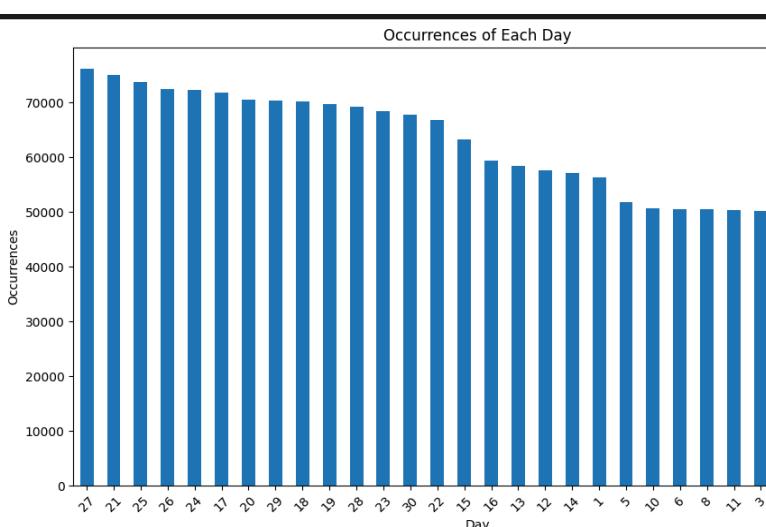
5.2 Locational Patterns:

We have combined the collision avoidance according to the patterns they are:

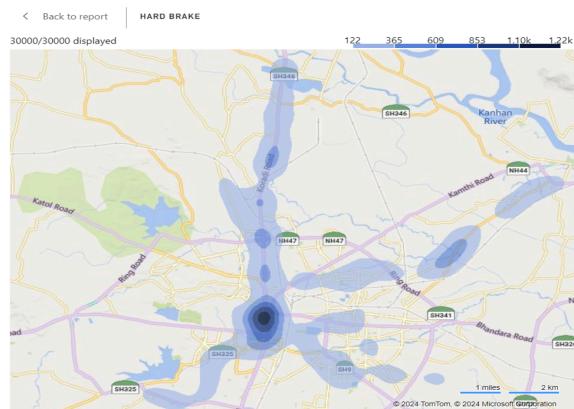
FCW & PCW: Alerts for potential collisions with vehicles/pedestrians.

HMW & LDW: Warnings for unsafe distances/lane departures.

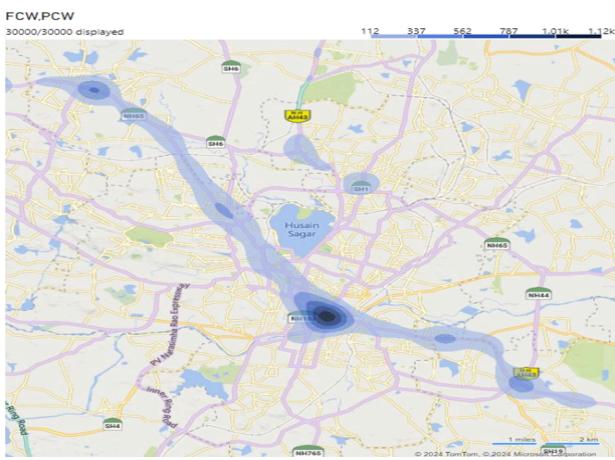
Driver Monitoring: Alerts for risky behaviours associated with the driver



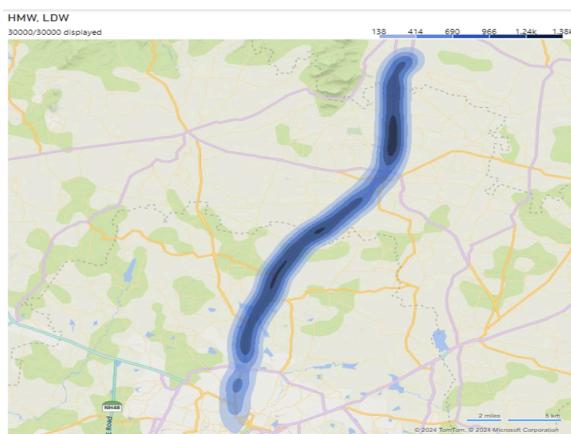
1) WARDHA ROAD, MAHARASHTRA:



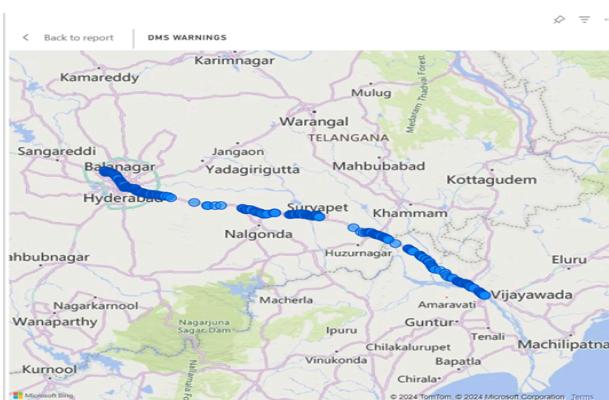
2) NH-65 – NH 123 ,MAHATMA GANDHI BUS STATION AREA AND REGIONS OF DILSUKH NAGAR AND UPPAL:



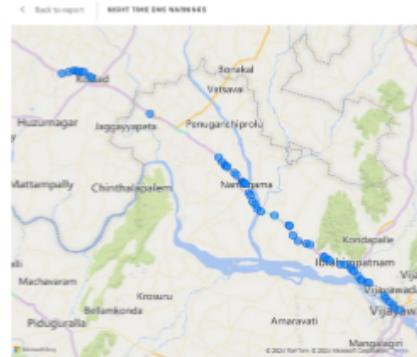
3) AIRPORT ROAD KARNATAKA:



4)DMS WARNINGS :ALONG HYD-VIZAG HIGHWAY:



5.3 Driver Behaviour analysis:



Investigating patterns of speeding, distractions, and compliance with safety measures

6.Conclusion:

To mitigate CAS alerts, implementing traffic calming measures can enhance road safety by reducing the likelihood of collisions. Conversely, addressing DMS alerts requires a multifaceted approach, including stricter enforcement of traffic laws on seat belt and mobile phone usage, as well as impaired driving. Additionally, ongoing investments in road infrastructure maintenance, such as well-kept road surfaces and improved visibility at intersections, are vital for fostering safer driving environments.

7.Result:

Over the past decade, high accident rates persist in areas like Vizag, Hyderabad, Wardha, and Karnataka, signaling a critical need for infrastructure upgrades. Persistent accidents highlight deficiencies in road design, signage, and safety measures, necessitating urgent action. Prioritizing investments in upgraded road surfaces, lighting, signage, and traffic management systems is crucial to enhance road safety and reduce accidents. Improved infrastructure will mitigate human and economic tolls, fostering safer travel for all road users.

8.Reference:

- 1)“Road Safety Audit: A Case Study for Wardha Road in Nagpur City”- MANISH.D.KATIYARI, PROF.S.D.GHODMARE
- 2)ROAD ACCIDENTS IN MAHARASHTRA 2020- Accident Research Cell

