Enhancing Road Safety in Chennai: Kepler-Based Detection of ADAS System-Generated Warnings

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**ABSTRACT**: Road safety is a paramount concern in urban environments like Chennai, where increasing traffic congestion and diverse road conditions pose significant challenges. Advanced Driver Assistance Systems (ADAS) have become integral to modern vehicles, offering real-time warnings to drivers about potential road hazards. However, the effectiveness of these ADAS-generated warnings in enhancing road safety depends on their accurate recognition. This report contains a detailed analysis of the provided dataset and contains the details of a greater number of alerts generated in specific regions. The report includes collections of alert data which describes the speed, vehicles, and time at which the alerts were generated.

**1.INTRODUCTION:** In recent years, the city of Chennai has witnessed a rapid surge in urbanization and vehicular traffic, presenting a formidable challenge for road safety. As the heart of Tamil Nadu's bustling metropolis, Chennai's roads have become increasingly congested, and the diversity of road conditions has made safe driving a critical concern. In response to these challenges, Advanced Driver Assistance Systems (ADAS) have emerged as a vital component of modern vehicles, offering real-time warnings to drivers about potential road hazards. This report contains the details of the alert, alert name and contains at what time the alerts were generated at each specific region, which vehicle type does cause these alerts and what speed they caused. This report’s insight is gathered by using Kepler – a powerful geospatial analysis tool. These insights might be useful for the organization for planning and taking rightful decisions.

**2.ANALYSIS:**

This report covers various analysis like Alert patterns, Time Patterns, Location Insights, Speed Analysis, Vehicle type analysis, Temporal and Spatial trends. Let us briefly discuss about the insights below

**2.1: Insights with Given Data**:

**Cas\_ldw:**

* More at outer-ring-road near Panimalar Engineering College Via Thirumudivakkam SIDO Industrial Estate to Grand Southern Trunk Road (98% Recorded)

Timing:5.14AM-7.53AM & 3.49PM-6.28PM

Vehicles:3143 to 5339

Speed:57-65Kmph (98%), 41-50Kmph (2%)

* Grand Trunk Southern Road from Outer – Ring Road junction (45% Recorded)

Timing:7.53AM-10.32AM, 3.49PM-6.28PM, 3.49PM-6.28PM, 6.28PM-9.06PM, 5.14AM-7.53AM(Rarely)

Speed:57-65Kmph

* More Warnings near Hanumantaputteri Reserved Forest

Timing:5.14AM-7.53AM

Vehicles: 805-2846, 2486-3143

* Chennai – Trichy – Dindugal Highway

Speed:21-32Kmph, 32-41Kmph

* Near Sri Maruthi Multi-Speciality Hospital (Chennai – Trichy – Dindugal Highway)

Timing: 5.14AM-7.53AM (More vehicles noted)

* Crescent Matric School- Nungambakkam (10%)

Timing: 5.14AM-7.53AM, 3.49PM-6.28PM

Vehicle: 805-1560(80%), 4583-5339(20%)

Speed: 0-10.8Kmph

**Cas\_Pcw:**

* Heavy near Uttamar Gandhi Salai (Nungampakkam)

Vehicles:805-2846, 3143-5339

Speed:0-10.8Kmph,10.8-21.7Kmph, 21-32Kmph

* Heavy alerts recorded at Triplicane area, Triplicane High Road

Vehicles: 3143-5339(91%), Others (9%)

Timing: 5.14AM-7.53AM (50%), 3.49PM-6.28PM (50%)

Speed: 0-10.8 Kmph, 10.8-21.7Kmph, 21.7-32.5Kmph

* Near Poonamalle – Kundrathur road, Pozhichalur Main Road

Timing: 3.49PM-6.28PM

Vehicle: 3072-3827

* Thousand Lights – Tambaram Flyover.

Vehicle:4583-5339

* Adhitanar Road

Speed: 21.7-32.5Kmph

Vehicle: 4583-5339(98%)

* Heavy near B.S Abdur Rahman University

Timing: 7.53AM-10.32AM, 1.10PM-3.49PM,3.49PM-6.28PM

Vehicle:805-1560, 2316-3072, 4583-5339

Speed:0-10.8Kmph, 10.8-21.7Kmph,21.7-32.5Kmph

* Vandalur-Mambakkam-Kelambakkam to Grand Southern Trunk Road (50% Recorded)

Timing**:** 7.53AM-10.32AM, 3.49PM-6.28PM

Vehicle: 805-1560,3072-3827,4583-5339(Rare)

* Crescent Matric School- Nungambakkam (30%)

Timing: 5.14AM-7.53AM, 3.49PM-6.28PM

Vehicle: 805-1560(80%), 4583-5339(20%)

Speed: 0-10.8Kmph

**Cas\_Hmw:**

* Moun**t** Road – Chennai Corporation Park (Sardar-Patel Road)

Timing: 5.14AM-7.53AM, 3.49PM-6.28PM

Vehicles: 4583-5339

Speed:21.7-32.5Kmph,32.5-43.3Kmph

* Vandalur-Mambakkam-Kelambakkam to Grand Southern Trunk Road (50% Recorded)

Timing**:** 7.53AM-10.32AM, 3.49PM-6.28PM

Vehicle: 805-1560,3072-3827,4583-5339(Rare)

* Ramakrishna Mutt Road- Arunchalapuram-Sardar Vallabhai Patel Flyover-Mount Rd(11.4KM) and Guindy U-Turn (Heavy Alert)

Vehicle: 4583-5339(50%), 805-1560(45%), Others (5%)

Speed: 32.5-43.3Kmph, 43.3-54.2Kmph

* College Road-Thousand Lights

Speed: 10.8-21.7Kmph, 21.7-32.5Kmph

Vehicles: 805-1560(30%), 4583-5339(70%)

* Crescent Matric School- Nungambakkam (20%)

Timing: 5.14AM-7.53AM, 3.49PM-6.28PM

Vehicle: 805-1560(80%), 4583-5339(20%)

Speed: 0-10.8Kmph

**Cas\_Fcw:**

* Crescent Matric School- Nungambakkam (Heavy alerts) (50%)

Timing: 5.14AM-7.53AM, 3.49PM-6.28PM

Vehicle: 805-1560(80%), 4583-5339(20%)

Speed: 0-10.8Kmph

* Maduranthakam (12.513463,79.887198) to Indian Bank (Maduranthakam) (Heavy alerts)

Speed:0-10.8Kmph, 10.8-21.7kmph, 21.7-32.5Kmph

Vehicle:805-1560, 2316-3072

Timing:5.14AM-7.53AM (30%),3.49PM-6.28(30%),6.28PM-9.06PM (40%)

**3.REFERENCE:**

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**4.URL:**

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