

Ambulance Service (KANIV-108) A Report (2021-2025)



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Ambulance Service (KANIV-108)

A Report (2021-2025)

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Message



GOVERNMENT OF KERALA
Pinarayi Vijayan
CHIEF MINISTER

No. 1170/Press/CMO/25

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MESSAGE

The Government of Kerala has always placed the health and safety of its citizen at the forefront of public policy. The KANIV 108 Emergency Ambulance Service stands as a testament to this commitment. Since its inception, the service has played a crucial role in saving lives by ensuring that every person in distress receives timely medical attention within the golden hour. During COVID, 108 Ambulance service was exemplary thereby all those needy patients could receive required treatment from the Health Institutions.

This documentation captures the evolution of the service over five years, from its contributions during the pandemic to its transformation into a robust, technology enabled emergency and interfacility transfer network that reaches every corner of our state.

Kerala's approach to public health has always been rooted in inclusiveness, preparedness and compassion. The insights from this report will help us further enhance emergency medical response, integrate digital systems and ensure that no life is lost for want of timely care.

I extend my appreciation to all those who contributed to this important work and to every frontline worker who has served with dedication under KANIV 108 mission.

Pinarayi Vijayan

The Additional Chief Secretary
E-mail : acs Keralahealth1@gmail.com

Message



Smt. Veena George

Minister for Health &
Family Welfare
and Woman & Child Welfare
Development
Government of Kerala

The 108 KANIV Ambulance network has become the lifeline of emergency care in Kerala. What began as a modest trauma care initiative has evolved into an essential component of the state's health care system. This five-year documentation provides a detailed account of how the system has adapted to changing needs, supporting out people during COVID-19, ensuring access during natural calamities and maintaining high operational efficiency across diverse terrains. It reflects Kerala's collective effort to combine modern technology, professional skill and public trust in building a people centred emergency care network.

I take this opportunity to appreciate the teams of the Department of Health & Family Welfare, Kerala Medical Services Corporation Ltd., GVK EMRI and all emergency medical technicians and drivers who serve relentlessly to save lives every day. Their work exemplifies Kerala's model of humane, citizen centred and efficient public health.

Veena George



Foreword

The KANIV-108 documentation provides a comprehensive picture of Kerala's emergency ambulance network over the five-year period from 2020 to 2025. It reflects the State's steady progress in building an efficient, technology-enabled system that ensures timely care and coordinated response to medical emergencies across all districts.

During this period, the service has evolved from a traditional ambulance fleet into a well-organised network that supports both emergency response and inter-facility transfers. The report highlights improvements in response time, reduction in cancellations, and better utilisation of 24-hour services. The insights from this documentation will help guide further strengthening of trauma and emergency-care systems. KANIV 108 stands today as an important pillar of Kerala's health-care delivery framework, ensuring that every citizen, regardless of geography, receives help when it is needed the most.

The most important aspect to be highlighted is the efficient service provided during COVID pandemic. I appreciate the efficient management during COVID period by Dr Navjot and Shri Balamurali, Managing Directors of KMSCL and Dr Dileepkumar, General Manager of KMSCL and the officers managing this service level contract. Going forward, the Health Department is working towards establishing a comprehensive ambulance grid system that will integrate all types of emergency vehicles public, private and institutional, under a unified command and coordination framework enabled by technology. Dr Vinay Goyal, Managing Director and Dr Arun, General Manager are working on these areas. This model can optimise resource use, improve regional coverage and ensure that every citizen can be reached within the critical response window, irrespective of location. KANIV 108 will continue to serve as the backbone of this grid, providing the operational experience and institutional strength on which future emergency-care systems will build.

I acknowledge the valuable contributions of the Kerala Medical Services Corporation Ltd. GVK EMIR and all health system partners who have supported this mission. Most of all, I extend my gratitude to the Emergency Medical Technicians & drivers whose dedication continues to keep this lifeline running for the people of Kerala.

Dr Rajan Khobragade IAS

Additional Chief Secretary
Health & Family Welfare and
AYUSH Department
Govt of Kerala.



Message

It gives me immense pride to present this comprehensive five-year documentation of the KANIV-108 Ambulance Service, a cornerstone of Kerala's emergency medical care system. This report is not merely a compilation of operational statistics; it stands as a testament to the unwavering commitment of every individual involved in saving lives across our State.

Over the years, KANIV-108 has evolved from a trauma-focused initiative into a robust, technology-enabled network that ensures timely response and coordinated patient transfers. The insights captured herein reflect how the system adapted to unprecedented challenges - be it the COVID-19 pandemic, natural disasters, or the growing demand for inter-facility transfers - while steadfastly upholding its core mission of delivering care within the critical golden hour.

I extend my heartfelt gratitude to the dedicated Emergency Medical Technicians, drivers, and support teams whose relentless service forms the backbone of this network. I also acknowledge the invaluable partnership of GVK EMRI and the guidance of the Health & Family Welfare Department in steering this initiative towards excellence.

As we look ahead, KMSCL remains committed to strengthening this vital lifeline through innovation, integration, and continuous improvement. Our goal is clear: to ensure that every citizen of Kerala, regardless of location or circumstance, has access to prompt and quality emergency care when it matters most.

Dr. Vinay Goyal IAS

Managing Director

Kerala Medical Services Corporation Limited (KMSCL).

Contents

Executive Summary	11
Introduction	13
Organogram of KEMP and GVK-EMRI	14
Service and Operations	15
Governance and Grievance Redressal	16
KANIV-108 Ambulance Features	16
Trauma Care Equipment	17
Control Room	19
Scope and Methodology	21
Scope of the documentation	21
Methodology	21
Data analysis	23
Section- B [Key Findings]	24
Call Trends	24
Trends in Peak and Off-peak Calls	24
Shift in Call Distribution	25
District-wise vehicle details in 2020-21	26
District-wise vehicle details in 2021-22	26
District-wise vehicle details in 2022-23	27
District-wise vehicle details in 2023-24	28
District-wise vehicle details in 2025-25	29
Five-Year Trends (2020-21 to 2024-25)	30
Vehicle Productivity	30
Relationship between Vehicle Count and Trips	31
Shifting Operational Dynamics: The Transition of KANIV 108 to an IFT-Focused Service	33
Ambulance Trip Trends by Condition	36
District-wise analysis of Ambulance Services in Kerala	39
2020-21	39
2022-23	47
2023-24	42
2024-25	43
Critical Evaluation of Five-Year Trends	43
Attended and cancelled trip	46
2020-21	46

2021-22	47
2022-23	48
2023-24	50
2024-25	51
Three-Year Comparison (2022-23 to 2024-25)	52
Total trips, achievement percentage (trips achieved out of total), and average response time	54
Detailed breakdown of achievements by district for the year 2021-22	55
Detailed breakdown of achievements by district for the year 2022-23	57
Detailed breakdown of achievements by district for the year 2023-24	59
Detailed breakdown of achievements by district for the year 2024-25	61
Long-term trend analysis	63
Financial details	66
Reimbursement for Extra Kilometers	67
Response time Penalty	68
Funds for operation	69
The Role of KANIV-108 During the COVID-19 Pandemic (2021-2022)	71
Special Operations at Sabarimala	74
Scooter First Responders for the Attukal Ponkala Festival	76
Pre-Hospital Arrival Notification System	78
KANIV-108's Crucial Role in Kerala's Emergency Responses	79
The Air India Express IX 1344 Crash	79
Pettimudi Landslide	80
Chooralmala Landslide	81
Discussion	82
Changing Patterns in Call Volume and Trip Composition	82
Differences Across Districts	82
Vehicle Productivity and Service Efficiency	83
Response Time and Achievement Percentage	83
Medical Conditions and Emergency Burden	84
Overall System Learning	84
Way Forward	85
Appendix	86

Executive Summary

This documentation has been undertaken to provide the government with a comprehensive analysis of the 108-KEMP-KANIV ambulance services and vehicle operations in Kerala over the five-year period from 2020-21 to 2024-25. The documentation highlights key trends in call volumes, district-wise vehicle activity, ambulance trip efficiency, cancellation rates, performance metrics, financial expenditures, and penalty provisions, offering detailed insights to support informed decision-making and enhance the effectiveness of emergency medical services across the state.

Overall, total calls and ambulance trips grew steadily from 2021 to 2023. Peak hours accounted for the majority of calls, though off-peak calls demonstrated more resilience in 2024. District-wise vehicle trips reveal Thiruvananthapuram as the dominant and most active district throughout, consistently leading in total trips and 24-hour vehicle productivity. In contrast, districts like Idukki, Wayanad, and Kasaragod had the lowest trips, impacted by geographical factors.

Ambulance services experienced a major shift post-pandemic. COVID-19-related trips dominated during 2020-21 but dropped sharply by 2022-23, when 'Other Emergencies' calls nearly monopolized ambulance workload, indicating a return to traditional emergency service needs. Overall trip volumes peaked in 2020-21 due to the pandemic, declined by 2022-23, then rebounded to a new, sustained high plateau in 2023-24 and 2024-25, nearly six times higher for non-COVID emergencies compared to the pandemic's start.

Performance indicators such as trip achievement percentages and average response times varied widely across districts. High performers like Wayanad and Palakkad recorded strong trip achievement rates alongside relatively fast response times, whereas districts such as Thrissur and Idukki struggled with longer response times and lower achievement. Notably, there is a moderate negative correlation between response time and achievement rate, showing faster responses generally lead to higher completion rates.

Cancellation rates declined overall, yet Thiruvananthapuram frequently had the highest cancellations despite its large trip volume. Peak hours had proportionally more

cancellations alongside higher trip volumes. Geographical terrain played a role in slower response times and operational challenges in districts like Idukki and Wayanad.

The financial report highlights increasing ambulance operating costs over five years, with detailed monthly rates for 24-hour and 12-hour services rising annually. The government enforces strict penalty clauses including fines for ambulance downtime and performance shortfalls, particularly targeting response time compliance differentiated by urban, rural, and difficult terrain areas. Funding for ambulance operations is sourced from the National Health Mission and State Directorate of Health Services, cumulatively.

In summary, Kerala's ambulance services have evolved with sustained high demand post-pandemic, emphasizing full-day ambulance utilization, operational efficiency improvements, and district-level performance variations shaped by geography and resource allocation. Financial measures and penalties incentivize maintaining service quality, with ongoing efforts needed to address challenges in slower-response and lower-efficiency districts to ensure equitable and timely emergency care statewide.

Introduction

The primary objective of an ambulance service is to provide timely and effective pre-hospital care. This includes reaching patients in emergency situations within the "golden hour," a critical window for administering lifesaving first aid on-site and while in transit. The secondary objective is to transport the patient quickly and safely to the nearest appropriate healthcare facility for definitive treatment.

The government of Kerala views road traffic accidents (RTAs) as a serious economic and public health issue. In response, it has implemented a structured approach to emergency medical services. In 2010, a pilot program called the Kerala Emergency Medical Services Project (KEMP) was launched in the Thiruvananthapuram district. This initiative, which was one of the first state-owned emergency services for trauma care victims in India, utilized a fleet of 25 advanced life support (ALS) ambulances. The project's operational costs were jointly funded by the National Rural Health Mission (60%) and the state government (40%).

Following the success of the pilot program, the government expanded the service to the Alappuzha district and later initiated a state-wide project called "KANIV-108" (Kerala Ambulance Network for Injured Victims). The primary goal of KANIV-108 is to provide comprehensive trauma care by quickly rescuing RTA victims and transporting them to the appropriate medical facilities within the "golden hour" to save lives.

The Kerala Medical Services Corporation Limited (KMSCL), a state-owned company, was tasked with managing the KEMP project and overseeing the implementation of KANIV-108. In July 2019, KMSCL and GVK EMRI (Emergency Management and Research Institute) entered into a five-year Service Level Agreement (SLA) to operate 315 Basic Life Support (BLS) ambulances across all 14 districts of Kerala. The agreement, which is subject to annual renewal based on performance, outlines a detailed framework for operations.

Under the agreement, GVK EMRI is responsible for sourcing vehicles, establishing a control room, recruiting staff, and covering the costs of fuel, vehicle maintenance, and salaries. KMSCL, in turn, provides an aggregated sum to GVK EMRI for operating these services. The contract includes specific terms of reference, such as the number of ambulances, service turnaround times, and a penalty structure for failing to meet the

minimum service levels. Key Performance Indicators (KPIs) have been established, and a monitoring process is in place to ensure compliance and accountability from both parties.

Organogram of KEMP and GVK-EMRI

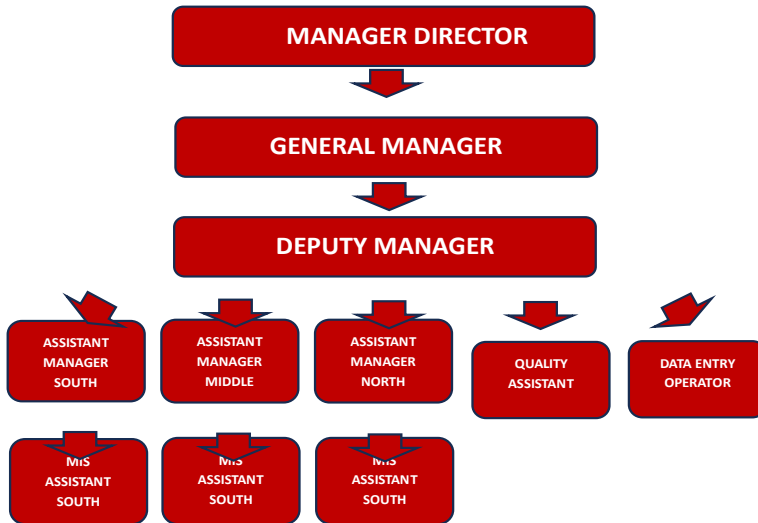


Figure 1: Organogram of KEMP Department

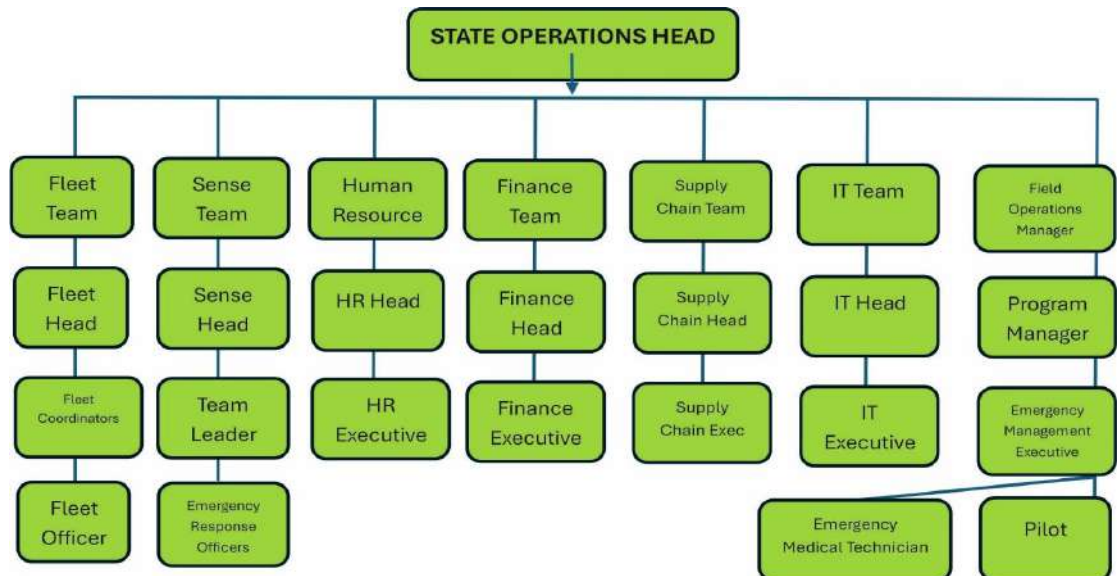


Figure 2: Organogram of GVK EMRI

Service and Operations

On September 25, 2019, the Chief Minister of Kerala launched the first phase of the KANIV-108 ambulance service in Thiruvananthapuram, which included 101 vehicles. The second phase, with an additional 100 vehicles, was inaugurated by the Health Minister in Kannur on October 21, 2019.

The ambulance fleet is divided into two categories: vehicles providing 12-hour and 24-hour service. All 315 ambulances are operational from 8:00 AM to 8:00 PM, a period when the highest number of accidents occur. Beyond road accidents, the service also attends to other medical emergencies, including those involving pregnant women, stroke patients, and heart patients, as well as providing support during disasters.

Each ambulance is equipped with a range of essential medical equipment to provide effective emergency care. This includes oxygen cylinders, suction pumps, pulse oximeters, nebulizers, and BP apparatus. For trauma and transport, the ambulances carry scoop stretchers, cervical collars, and spine boards. All of these services are delivered under the direct supervision of a trained Emergency Medical Technician (EMT).



Figure 3: Kerala Chief Minister Pinarayi Vijayan inaugurates the 108 ambulance services, enhancing emergency medical response across the state.

Governance and Grievance Redressal

The project is overseen by two committees:

- **District-Level Committee:** Chaired by the District Collector, with members including the Superintendent of Police, District Medical Officer, District Programme Manager, and Regional Transport Officer.
- **State-Level Committee:** Chaired by the Health Secretary, with the Director of Health and Director of Medical Education as members.

For user feedback and complaints, toll-free number, **18005992270**, is prominently displayed on all ambulances.

KANIV-108 Ambulance Features

The KANIV-108 ambulance is equipped with a range of features to ensure effective and hygienic emergency medical services. All vehicles are designed with dedicated storage for medical equipment, medicines, and consumables.

Each ambulance is fitted with two B-Type oxygen cylinders, capable of holding over 1500 liters of oxygen. Basic Life Support (BLS) ambulances are specifically equipped to handle a variety of emergencies, including trauma, cardiac events, and labor-related situations.

For increased visibility and communication, the ambulances feature a rhombus-shaped light bar with an integrated high-intensity public address system and prominent exterior reflective stickers. The rear doors can open at 270 degrees, which allows for quick and easy patient transfer, especially in public areas.

These BLS ambulances also include essential extraction tools, which are critical for rescuing individuals trapped in wreckage. The interiors are built with a seamless medical-grade polyurethane anti-abrasive epoxy flooring. This advanced flooring is not only anti-static, anti-bacterial, and anti-fungal but also anti-skid and fire-resistant. This design makes it easy to clean, maintain, and ensures a sterile and hygienic environment.



Figure 4: Emergency medical technicians (EMTs) from Kerala's 108 ambulance service attend to a patient on a stretcher, demonstrating the on-site care provided before transport.

Trauma Care Equipment

The KANIV-108 ambulance is equipped with specialized tools to handle trauma cases. An auto-loading patient trolley allows a single rescuer to effortlessly load a patient into the ambulance. For patients with multiple or spinal injuries, a scoop stretcher is used to move them while keeping the spine aligned, preventing further damage. A spine board offers crucial support during patient transfer. When a trolley can't be used, a folding wheel/stair chair is available to carry patients.

Crucial to surviving severe trauma is the management of the Airway, Breathing, and Ventilation systems. The KANIV-108 carries both fixed and portable Oxygen Supply systems with high-flow regulators and a variety of delivery devices (non-rebreathing masks, nasal cannulas). Suction Apparatus, fixed and portable, is mandatory for clearing blood and secretions from the airway using various catheters and rigid tips. Furthermore, personnel are equipped with Bag-Valve Masks for manual ventilation, and Laryngoscopes and Endotracheal Tubes for advanced airway procedures.

The ambulance is equipped with trauma shears to rapidly access injured areas. For severe external bleeding, arterial tourniquets are accessible for extremity injuries, while hemostatic dressings and specialized wound-packing material are used to control bleeding in deep wounds. Chest injuries often require specific tools, and the KANIV-108

carries occlusive dressings for penetrating chest wounds and needles for needle decompression to relieve tension pneumothorax.

The ambulances are also stocked with various immobilization devices, including splints for bone fractures, a cervical collar to prevent damage from neck injuries, and a spinal brace to stabilize the spine. Essential safety equipment, such as various sizes of containers for safe disposal and full personal protective equipment (PPE), including high-visibility safety wear, gloves, and eye protection, is maintained for the crew's and patient's safety.



Figure 5: Inside a KANIV-108 ambulance, a paramedic administers care to a patient during transport

In addition to the trauma equipment, the KANIV-108 ambulances are equipped with a well-stocked medication kit for immediate life-saving interventions. This includes vital drugs to manage a range of medical emergencies. For cardiac and circulatory support, they carry medications like epinephrine for anaphylaxis and cardiac arrest, atropine for bradycardia, and nitro-glycerine for chest pain. Patients experiencing respiratory distress may receive bronchodilators. The kit also contains a range of analgesics for pain management, antiemetics for nausea, and IV fluids like Normal Saline for rehydration and to maintain blood pressure. To address specific conditions like diabetic emergencies, the ambulance is stocked with glucose and dextrose, while for seizures, benzodiazepines are available. These essential drugs, combined with the crew's training, allow them to stabilize patients and manage critical symptoms on-scene and in transit to the hospital.



Figure 6: Emergency medical technicians from Kerala's 108 service provide vital first aid to a patient at their home

Control Room

The KANIV-108 control room is the nerve center for Kerala's free emergency ambulance service, managed by GVK EMRI in a public-private partnership with the Kerala government. Located on the fourth floor of the Thejaswini building at Technopark, this facility coordinates the statewide fleet of ambulances. The smooth operation of this critical emergency response system relies on a combination of advanced technology, well-defined protocols, and a highly trained staff.

Every ambulance in the KANIV-108 fleet is equipped with a GPS device. The control room uses this technology to pinpoint the exact location of each ambulance and identify the one closest to the emergency site. This minimizes response time, which is critical during the "golden hour" after an accident or medical emergency.

The control room staff maintain constant communication with the ambulance crew, consisting of a driver and an Emergency Medical Technician (EMT). This ensures that patients receive appropriate pre-hospital care before reaching the hospital. When a call comes in, the emergency response officer quickly assesses the situation to determine the nature and severity of the emergency. Based on the information collected, the officer dispatches the nearest available ambulance to the location.

The control room provides crucial details about the patient and the emergency to the ambulance crew, including details for patients who may need special care, like stroke or heart patients. The team continuously monitors the status of each ambulance trip, ensuring the patient is transported safely and efficiently. This integrated approach, with central coordination of ambulances and hospitals, is key to the project's success.



Figure 7: The nerve center of Kerala's 108 ambulance service, the KANIV-108 control room in Technopark, Thiruvananthapuram.



Figure 8: A wide view of the 108 control room.

Scope and Methodology

Scope of the documentation

Table 1: Key areas that have been the subject of examination under the documentation

No.	Key areas of examination
1.	Types of calls, call details, trends in demand for ambulance services, and the related factors
2.	Compliance in terms of equipment availability and maintenance, medicine availability, consumables availability, vehicle maintenance, and qualification of pilot and emergency medical technician (EMT)
3.	The efficiency of the process – measured in terms of patient feedback, trip reports, and maintenance of response time.
4.	Infrastructure and Resources - Software and hardware installation as per specifications, set up and maintenance of control rooms with required specifications
5.	Deviations (including payments and penalty calculations) and steps for improvement – episodes of deviation from service legal agreement and resolutions
6.	Review of the monitoring system and the data support

Methodology

The primary objective of this documentation exercise was to conduct a comprehensive analysis of ambulance service operations, with a focus on key performance indicators and operational efficiency.

Data Sources

The documentation report's principal sources of information were the secondary data from KMSCL and GVK-EMRI, which included a series of annexures detailing various aspects of ambulance services. The data encompassed a five-year period, allowing for both a longitudinal analysis of trends and a detailed examination of performance metrics across different districts and operational contexts.

The analysis was performed on the following key datasets:

- **Vehicle and Trip Details:** Data concerning the number of vehicles, trips (attended and cancelled), and total distance traveled, categorized by district and operational hours (24-hour vs. 12-hour vehicles). This included an assessment of productive and non-productive trips.
- **Trip Categorization:** An in-depth analysis of trips categorized by case type (Emergency, Inter-Facility Transfer [IFT], and Government Special Request), providing insights into the demand profile for different types of services.
- **Response Time Analysis:** Data on response times, including a breakdown by geographical area (Urban, Rural, and Difficult Terrain), as well as a district-wise analysis of average response times.
- **Operational Efficiency Metrics:** A review of metrics such as average kilometers run per trip, trips per ambulance per day, and percentage of attended vs. cancelled trips. The reasons for trip cancellations were also analyzed to identify operational bottlenecks and areas for improvement.

Analytical Approach

The analysis followed a structured approach, with a focus on several key areas:

1. **Quantitative Analysis:** All provided data tables were analyzed to calculate and present key performance metrics. This involved calculating averages, percentages, and totals to identify patterns, trends, and anomalies in the operational data.
2. **Comparative Analysis:** Performance metrics were compared across different districts and time periods to highlight regional variations and year-over-year changes in operational efficiency and service delivery.

Data analysis

The data were analysed using Microsoft Excel and R. The proportions of the call types, call details, trends in demand for ambulance services, and the related factors were calculated. The percentages of compliance in terms of equipment availability and maintenance, medicine availability, consumables availability, vehicle maintenance were calculated. The type of rides, and response time were calculated.

Key Findings

Call Trends

- **Total calls** showed strong growth from 2021 to 2023, with increases of 11.82% and 9.02% in 2022 and 2023 respectively.
- However, in 2024, the trend reversed, with a decline of 3.18% in total calls.

Table 2: Number of Emergency Calls Received During Peak and Off-Peak Hours, 2021-2024

Call analysis – Call Flow (Incoming)				
Working Hours	2021	2022	2023	2024
Peak	819760	883797	952100	914797
Off-peak	275596	340990	383200	378020
Total	1095356	1224787	1335300	1292817

Trends in Peak and Off-peak Calls

- **Peak calls** followed a similar pattern to the total calls, growing by 7.81% in 2022 and 7.73% in 2023 before experiencing a 3.92% decrease in 2024.
- **Off-peak calls** showed the most significant growth in the initial years, with a sharp increase of 23.73% from 2021 to 2022, followed by a 12.38% growth in 2023.
- While Off-peak calls also declined in 2024, the decrease was much smaller, at 1.35%, indicating more resilience compared to peak and total calls.

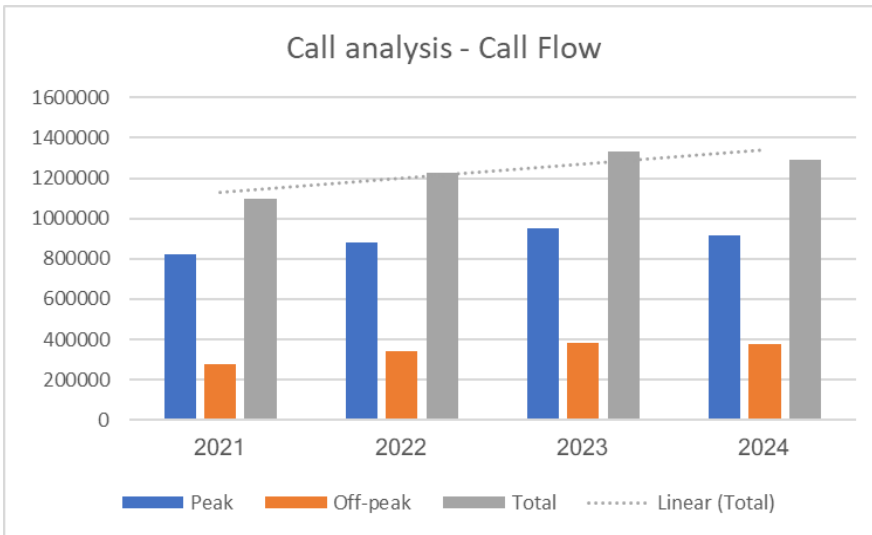


Figure 9: Trends in Peak and Off-peak Calls

Shift in Call Distribution

- Peak calls consistently made up the majority of the total calls (75-78%) during the period.
- The smaller decline in off-peak calls in 2024 suggests a potential shift in caller behaviour, with a slightly higher proportion of calls now coming in during off-peak hours compared to previous years.

Table 3: Percentage Change in Emergency Calls (Peak, Off-Peak, and Total) from 2022 to 2024

Year	Peak % Change	Off-peak % Change	Total % Change
2022	7.81%	23.73%	11.82%
2023	7.73%	12.38%	9.02%
2024	-3.92%	-1.35%	-3.18%

District-wise vehicle details in 2020-21

Overall, the total vehicle trips were higher in districts like Palakkad, Thiruvananthapuram, and Malappuram, while districts like Idukki and Wayanad had the lowest total number of trips.

Total Vehicle Trips

The total trips are the sum of trips from both 24-hour and 12-hour vehicles.

- **Highest Trips: Palakkad** reported the highest number of total trips with 31,030. This was followed by **Thiruvananthapuram** (26,152 trips) and **Malappuram** (24,936 trips).
- **Lowest Trips: Idukki** recorded the fewest total trips at 7,048, followed by **Wayanad** with 8,181 trips.

Average Trips per Vehicle

- **24-hour vehicles:** The average trips per 24-hour vehicle were generally higher than those of 12-hour vehicles. Districts with particularly high averages were **Kannur** (1064), **Kottayam** (1060), and **Alappuzha** (1013).
- **12-hour vehicles:** **Palakkad** recorded the highest average trips per 12-hour vehicle at approximately 1059, followed by **Kottayam** (990) and **Kasaragod** (942).

Interestingly, some districts with a high total number of vehicles, such as **Ernakulam** (32 vehicles), had relatively low trip numbers compared to districts like **Palakkad** (28 vehicles) and **Thiruvananthapuram** (29 vehicles). This suggests that the total number of vehicles does not directly correlate with the total number of trips, and that vehicle utilization varies significantly by district.

District-wise vehicle details in 2021-22

Total Vehicle Trips

- **Highest Trips: Thiruvananthapuram** reported the highest number of total trips with 26,858. This was followed by **Ernakulam** (20,157 trips) and **Palakkad** (18,182 trips).

- **Lowest Trips: Idukki** recorded the fewest total trips with 6,510, followed by **Kasaragod** (7,580 trips) and **Wayanad** (9,193 trips).

Average Trips per Vehicle

- **24-hour vehicles:** The average trips per 24-hour vehicle were highest in **Alappuzha** (approximately 1,193 trips), followed by **Thiruvananthapuram** (953 trips) and **Kollam** (885 trips).
- **12-hour vehicles: Thiruvananthapuram** also had the highest average trips per 12-hour vehicle (875 trips), followed by **Wayanad** (833 trips) and **Kollam** (744 trips).

While districts like **Ernakulam**, **Malappuram**, and **Thrissur** have the highest number of total vehicles (32 each), they do not necessarily rank at the top for total trips. This suggests that the utilization rate of vehicles varies considerably across districts. For instance, **Alappuzha** achieved a high average number of trips per 24-hour vehicle despite having a lower number of total vehicles (18). This highlights the efficiency of vehicle usage in certain areas.

District-wise vehicle details in 2022-23

Total Vehicle Trips

- **Highest Trips: Thiruvananthapuram** leads with a massive 32,519 total trips, showing a substantial increase from the previous year. This is followed by **Ernakulam** (20,381 trips) and **Alappuzha** (18,146 trips).
- **Lowest Trips: Idukki** recorded the fewest trips at 5,253, followed by **Wayanad** (5,517 trips) and **Kasaragod** (7,408 trips).

Average Trips per Vehicle

A notable trend in 2022-23 is the considerable difference in efficiency between 24-hour and 12-hour vehicles. While 24-hour vehicles consistently show higher average trip numbers, the average trips for 12-hour vehicles have declined across most districts.

- **24-hour vehicles: Alappuzha** had the most productive 24-hour vehicles, with an average of 1,452 trips per vehicle. **Thiruvananthapuram** followed with 1,373 trips and **Kollam** with 1,075 trips per vehicle.

- **12-hour vehicles:** The average trips for 12-hour vehicles were significantly lower across the board. The highest average was in **Thiruvananthapuram** (644 trips), followed by **Alappuzha** (565 trips) and **Kollam** (421 trips). This indicates a possible shift in operational focus or a decrease in demand for shorter-duration vehicle services.

The data for 2022-23 highlights **Thiruvananthapuram** as a dominant center for vehicle activity, especially for 24-hour services. While districts like **Ernakulam** and **Thrissur** have the highest number of total vehicles, their average trip numbers per vehicle, particularly for 12-hour vehicles, are notably lower. This suggests that while vehicle fleet size is large, their overall utilization might be less efficient compared to districts like **Thiruvananthapuram** and **Alappuzha**.

District-wise vehicle details in 2023-24

Total Vehicle Trips

- **Highest Trips:** **Thiruvananthapuram** remains the top performer with 32,813 total trips, a consistent trend from the previous year. This is followed by **Ernakulam** (22,211 trips) and **Thrissur** (17,882 trips).
- **Lowest Trips:** **Idukki** recorded the fewest total trips at 5,674, followed by **Wayanad** (6,091 trips) and **Kasaragod** (7,300 trips), a pattern seen in earlier years as well.

Average Trips per Vehicle

The efficiency of 24-hour vehicles continues to be significantly higher than that of 12-hour vehicles, a trend that has become more pronounced over the years.

- **24-hour vehicles:** **Thiruvananthapuram** leads in productivity, with an average of 1,405 trips per vehicle. **Alappuzha** is a close second with 1,399 trips, and **Ernakulam** follows with 1,050 trips per vehicle.
- **12-hour vehicles:** The average trips for 12-hour vehicles are considerably lower. The most productive districts in this category were **Thiruvananthapuram** (611 trips), **Alappuzha** (538 trips), and **Kollam** (437 trips).

The analysis confirms **Thiruvananthapuram**'s dominance in vehicle operations. It not only leads in total trips but also in the efficiency of its 24-hour vehicles. While districts

like **Ernakulam**, **Thrissur**, and **Malappuram** have the largest vehicle fleets (32 vehicles each), their overall trip numbers per vehicle, particularly for 12-hour services, are relatively low. This suggests that the high number of vehicles in these districts does not translate to a proportional increase in trips, indicating varying levels of vehicle utilization.

District-wise vehicle details in 2024-25

Total Vehicle Trips

- **Highest Trips: Thiruvananthapuram** remains the leader with 33,427 total trips, reinforcing its position as the most active district. **Ernakulam** (21,611 trips) and **Thrissur** (17,798 trips) hold the second and third positions, respectively.
- **Lowest Trips: Idukki** recorded the fewest total trips at 5,553, followed by **Wayanad** (5,826 trips) and **Kasaragod** (6,892 trips). This pattern has been consistent over the years.

Average Trips per Vehicle

A distinct operational trend continues to be the high productivity of 24-hour vehicles compared to 12-hour vehicles.

- **24-hour vehicles:** The most efficient 24-hour vehicles were found in **Thiruvananthapuram**, with an average of 1,435 trips per vehicle. **Alappuzha** followed with 1,273 trips, and **Ernakulam** with 1,012 trips per vehicle.
- **12-hour vehicles:** The productivity of 12-hour vehicles was significantly lower. The highest averages were in **Thiruvananthapuram** (617 trips), **Alappuzha** (526 trips), and **Pathanamthitta** (453 trips). This indicates a strong operational preference for full-day services in these regions.

The data for 2024-25 highlights a clear disparity between vehicle fleet size and operational efficiency. While districts like **Ernakulam** and **Thrissur** have a large number of vehicles (32 each), their average trips per vehicle, especially for 12-hour services, are relatively low. In contrast, **Thiruvananthapuram**, with a smaller fleet, achieves the highest total trips and vehicle productivity. The data suggests that districts with a high concentration of 24-hour vehicles, such as **Thiruvananthapuram**, consistently demonstrate higher overall efficiency and output.

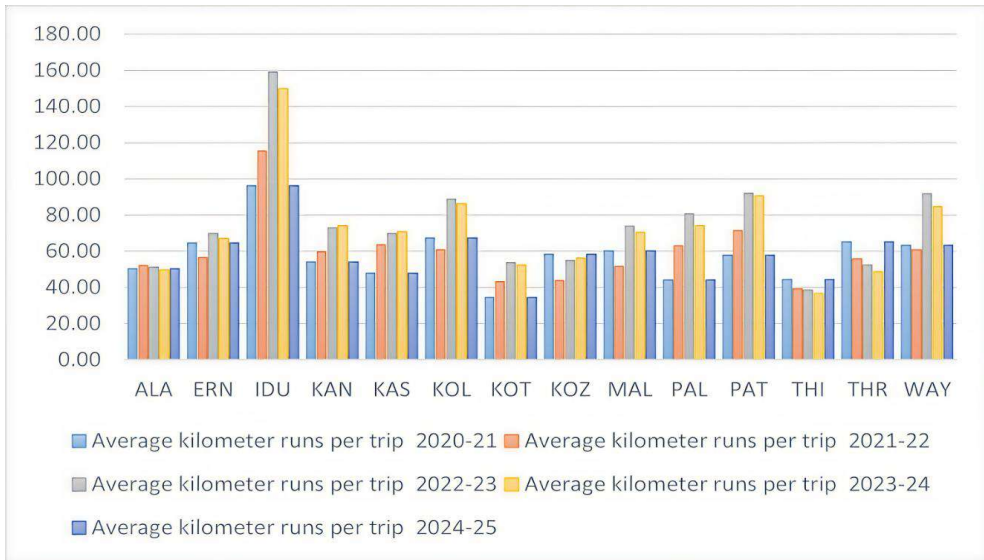


Figure 10: Average Kilometers Run per Emergency Trip by District, 2020-2025

Five-Year Trends (2020-21 to 2024-25)

Overall Vehicle Activity

There has been a consistent increase in total vehicle trips across the districts, with some fluctuations.

- **Dominant District: Thiruvananthapuram** consistently led all districts in total trips throughout the entire five-year period. Its total trips increased significantly, from 26,152 in 2020-21 to 33,427 in 2024-25.
- **Top Performers: Ernakulam and Thrissur** consistently ranked in the top three for total trips, often vying for the second and third positions. Their total trips have also shown a positive trend over the years.
- **Lower-Performing Districts: Idukki, Wayanad, and Kasaragod** consistently recorded the lowest total trips each year, suggesting a lower volume of vehicle activity compared to other districts.

Vehicle Productivity

A clear and widening gap in productivity between 24-hour and 12-hour vehicles is the most prominent trend.

- **24-hour Vehicles:** The average trips per 24-hour vehicle have shown a general upward trend, particularly in **Thiruvananthapuram**, where the number of trips per vehicle increased from 918 in 2020-21 to 1,435 in 2024-25. This indicates a high and increasing utilization of full-day vehicle services.
- **12-hour Vehicles:** In contrast, the average trips per 12-hour vehicle have generally declined or remained stagnant across most districts. For example, in **Malappuram**, trips per 12-hour vehicle fell from 746 in 2020-21 to 186 in 2024-25. This suggests a decrease in demand for or efficiency of shorter-duration vehicle services over the five years.

Relationship between Vehicle Count and Trips

- The data reveals that a high number of total vehicles does not always correlate with the highest number of total trips. Districts like **Ernakulam**, **Malappuram**, and **Thrissur** consistently had the highest number of total vehicles but were often surpassed in total trips by **Thiruvananthapuram**, which had a smaller fleet size. This highlights the importance of vehicle utilization and operational efficiency over fleet size.

Table 4: Avg. km runs / ambulance / month, district-wise from 2020-25

Avg. km runs / ambulance / month					
District	2020-21	2021-22	2022-23	2023-24	2024-25
ALA	3843.61	3933.80	4288.66	3997.72	3843.61
ERN	2199.39	2954.86	3700.08	3880.03	2199.39
IDU	3760.44	4172.92	4637.19	4720.61	3760.44
KAN	4132.05	2561.46	3222.96	3584.15	4132.05
KAS	3380.89	2867.30	3072.74	3075.00	3380.89
KOL	3826.85	4073.33	5180.43	5091.88	3826.85
KOT	2934.05	2575.33	3099.51	2779.10	2934.05

KOZ	3042.96	1875.01	1838.01	2274.56	3042.96
MAL	3900.61	2222.94	2144.35	2170.96	3900.61
PAL	4053.88	3400.54	3059.27	3151.49	3914.09
PAT	3800.63	3836.13	4203.31	4508.48	3167.19
THI	3338.26	3014.82	3598.82	3442.48	3338.26
THR	3517.53	2086.40	2140.15	2262.33	3517.53
WAY	3913.43	4222.58	3833.11	3900.05	3913.43

Shifting Operational Dynamics: The Transition of KANIV 108 to an IFT-Focused Service

While the service's primary objective is to respond to emergencies, its function has increasingly been dominated by Inter-Facility Transfers (IFT). The total number of trips peaked in 2020-21 and has since stabilized around the 190,000 to 200,000 range. The core insight, however, lies in the changing composition of these trips.

Evolving Service Focus

The most striking trend over the five-year period is the dramatic decline in emergency trips and the corresponding surge in IFTs. Emergency trips plummeted from a high of 222,159 in 2020-21 to just 58,801 in 2024-25, a decrease of over 73%. Concurrently, IFT trips surged from 19,793 to 134,141 over the same period, a remarkable increase of over 577%. This shift is clearly illustrated by the percentage of trips for each category. In 2020-21, emergency calls accounted for ~92% of the total workload. By 2024-25, this figure had dropped to just ~30%, while IFTs now represent over 69% of the total trips. This data indicates that the KANIV 108 service has transitioned from a primarily emergency response system to a dedicated inter-facility patient transport service.

Central Kerala Trends

Districts in central Kerala, such as Thrissur, Ernakulam, and Kottayam, showcase a clear and sustained move toward IFT dominance. Thrissur's emergency trips fell from 20,201 to 5,258 over the five years, while its IFTs surged from 590 to 12,479, making IFTs its primary service by 2024-25. Similarly, Ernakulam saw its emergency calls drop to 5,392 from a high of 16,204 in 2021-22, while its IFTs grew exponentially to 16,219, indicating a strategic shift toward high-volume patient transport. Kottayam's data mirrors this trend, with a significant decrease in emergency trips and a concurrent rise in IFTs to become the majority of its service.

North and South Kerala Trends

The northern districts of Malappuram, Kannur, and Kozhikode show the most extreme operational transformation. They have all transitioned from a strong emergency focus to being almost exclusively IFT-centric. Malappuram and Kannur saw their emergency trip counts drop by over 85%, while their IFTs increased over ten-fold. In 2024-25, over 80% of trips in both these districts were IFTs. Similarly, Kozhikode's emergency trips fell to

4,845 from a peak of 18,932, while IFTs became its main activity. In the south, Alappuzha and Kollam followed this trend, with emergency trips declining to less than a third of their initial numbers, and IFTs becoming the primary service.

Districts with Unique Trends

While the IFT trend is universal, Thiruvananthapuram stands out as a unique case. It consistently records the highest total trip volume and, despite a decline, maintains a high number of emergency trips (18,610 in 2024-25), indicating its continued role as a critical emergency hub. However, its IFTs have also skyrocketed to 14,633, suggesting it serves a dual role in both emergency response and patient logistics. In stark contrast, mountainous districts like Idukki and Wayanad have the lowest overall trip volumes but show the same proportional shift. Their emergency trip counts have fallen to below 1,000, while IFTs now account for over 80% of their services. This highlights that the change in operational focus is not just a high-volume urban phenomenon but a statewide reality.

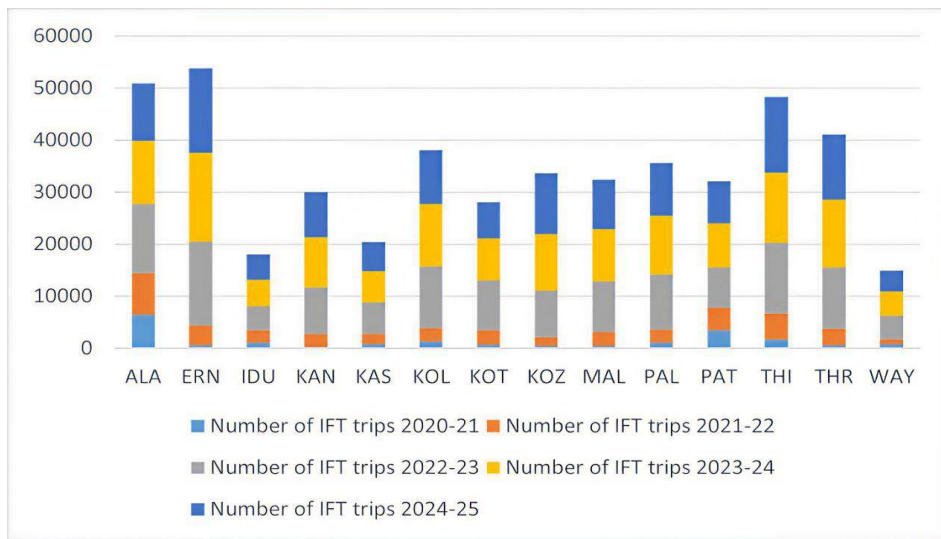


Figure 11: Number of Inter-Facility Transfer (IFT) Trips by District in Kerala, 2020-2025

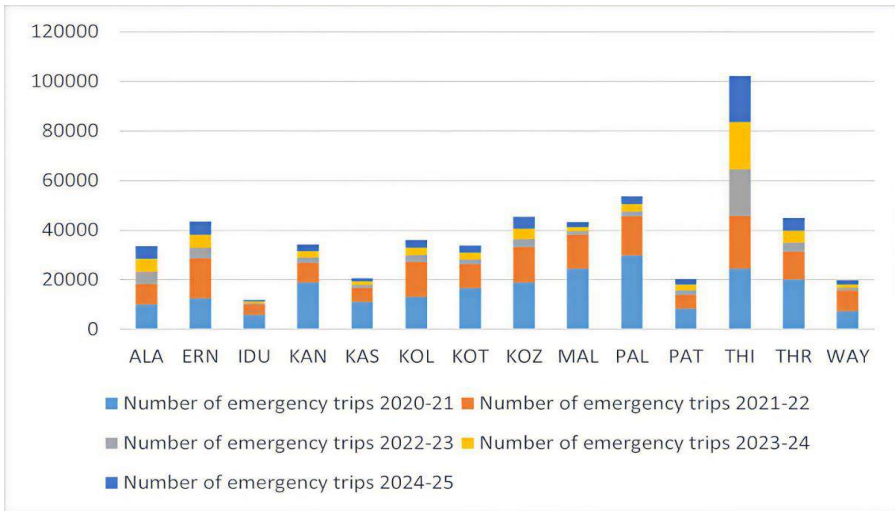


Figure 12: Number of Emergency Trips by District in Kerala, 2020-2025

Ambulance Trip Trends by Condition

The most notable trend is the dramatic impact of the COVID-19 pandemic on the number of trips. During 2020-21 and 2021-22, COVID-19 was the overwhelming reason for ambulance trips, accounting for over 208,000 and 132,000 trips respectively. This number completely overshadows all other complaints during these years.

As the pandemic subsided, trips for COVID-19 dropped sharply to negligible numbers by 2023-24. This decline allowed other medical conditions to re-emerge as the leading reasons for ambulance dispatches.

From 2022-23 to 2024-25, Cardiac and Breathing Problem complaints consistently ranked as the top two reasons for trips. This suggests these conditions represent the most frequent non-pandemic medical emergencies in the region.

Trauma (Vehicular), Trauma (Non-Vehicular), and Abdominal Pain have also remained consistently high, featuring in the top six complaints across all five years. This highlights the sustained demand for ambulance services for injuries and common medical issues. The number of trips for these conditions generally increased from 2020-21 to 2022-23 before stabilizing or slightly decreasing in the most recent years.

Trips for diabetic problems show a steady, growing trend from 2020-21 to 2023-24, followed by a slight decrease in 2024-25. The consistent and significant number of trips for diabetic problems, peaking at over 3,000, reflects the widespread prevalence of the disease. These trips are typically for acute complications such as severe hypoglycemia or hyperglycemia, which are both common and dangerous. The trend indicates the consistent burden placed on emergency services by this chronic disease.

The trend for Nipah is not a consistent upward or downward curve like other complaints. Instead, it shows a sporadic, outbreak-driven pattern. This pattern is consistent with the nature of Nipah outbreaks, which are localized and short-lived. The number of trips reflects the severity and timing of a specific outbreak event, rather than a continuous or chronic health issue. The high number of trips in 2021-22 and 2023-24 suggests significant, albeit contained, public health emergencies during those years.

The trend for poisoning cases shows a notable increase and then a stabilization or slight decrease in the most recent years. This trend is particularly concerning. The sharp rise from 2020-21 to 2023-24 aligns with a global increase in mental health-related crises

during and after the pandemic. While the data doesn't specify if the poisoning was accidental or intentional, a significant portion of these cases are often linked to deliberate self-harm or suicide attempts.

Interestingly, complaints for “Attempted Suicide” showed a concerning rise, from zero trips in the initial years to 937 in 2024-25, indicating a potential increase in mental health crises requiring emergency intervention.

In summary, the data reflects a clear shift from a pandemic-dominated landscape to one where chronic and common emergencies like cardiac events, breathing problems, and trauma are the primary drivers of ambulance service demand.

Table 5: Top Six Reasons for Emergency Calls to KANIV-108, 2020-2025

Rank	2020-21	2021-22	2022-23	2023-24	2024-25
1	COVID-19 (208619)	COVID-19 (132955)	Cardiac (32822)	Cardiac (33441)	Cardiac (33262)
2	Cardiac (6514)	Cardiac (11586)	Breathing Problem (26808)	Breathing Problem (27852)	Breathing Problem (26289)
3	Unknown Problem (4800)	Trauma (Vehicular) (9920)	Unknown Problem (22969)	Unknown Problem (24722)	Trauma (Non-Vehicular) (23692)
4	Trauma (Vehicular) (4286)	Trauma (Non-Vehicular) (8558)	Trauma (Vehicular) (22174)	Trauma (Non-Vehicular) (23965)	Unknown Problem (22115)
5	Trauma (Non-Vehicular) (4047)	Unknown Problem (8482)	Trauma (Non-Vehicular) (21921)	Trauma (Vehicular) (22644)	Trauma (Vehicular) (21553)
6	Abdominal Pain (3401)	Breathing Problem (8140)	Abdominal Pain (16727)	Abdominal Pain (17498)	Abdominal Pain (18640)

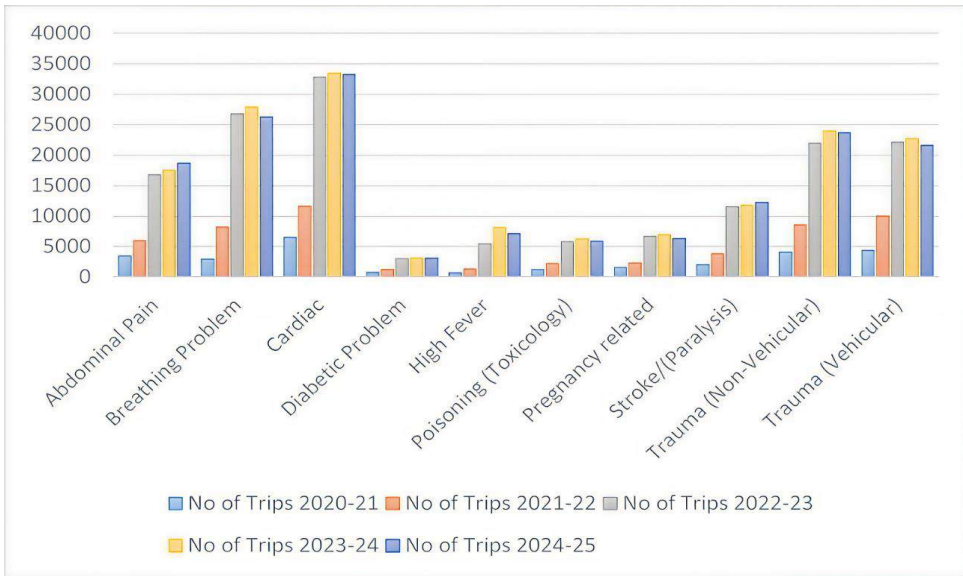


Figure 13: Distribution of KANIV-108 Emergency Trips by Medical Condition, 2020-2025

District-wise analysis of Ambulance Services in Kerala

2020-21

1. Distance Covered

- **Malappuram** recorded the highest distance travelled (1,497,834km), with **Palakkad** and **Thrissur** also showing high figures.
- **Wayanad** had the lowest distance travelled (516,573km).

2. Trip Efficiency

The average distance per trip provides a measure of operational efficiency, indicating whether trips were typically for shorter or longer distances.

- **Kozhikode** had the highest average distance per trip, with an average of approximately 58.23km. This suggests that ambulances in this district often covered longer distances for each call.
- **Wayanad** had a high average distance per trip of approximately 56.40km, ranking second.
- **Kottayam** recorded the lowest average distance per trip, at approximately 34.41km, followed by **Kasaragod** (47.83km). This indicates that trips in these districts were typically for shorter distances.

3. Trip Type Breakdown

The data for 2020-21 shows the significant impact of the COVID-19 pandemic on ambulance services.

- **High COVID-19 Concentration:** Districts like **Palakkad** (94.68), **Malappuram** (96.02), and **Kannur** (96.73) had an overwhelming majority of their trips dedicated to COVID-19-related emergencies.
- **Higher 'Other Emergencies' Trips:** **Alappuzha** had a significantly higher percentage of trips for 'Other Emergencies' (58.80), followed by **Pathanamthitta** (38.44) and **Thiruvananthapuram** (23.41). This suggests that non-COVID emergencies constituted a more substantial part of ambulance services in these districts.

-

Key Performance Highlights

The data for 2021-22 reflects the operational landscape of ambulance services as the state managed the COVID-19 pandemic and other medical emergencies.

- **Overall Trips and Distance:** Across the state, ambulances completed a total of **201,337 trips**, covering a total distance of **11,206,443 km**.

Analysis by District

1. Distance Traveled

The total distance traveled by ambulances correlates with the size and geographical spread of each district, as well as the length of emergency routes.

- **Highest Distance Traveled:** **Palakkad** (1,142,581 km) and **Ernakulam** (1,134,666 km) registered the most distance, reflecting a high volume of long-distance transports.
- **Lowest Distance Traveled:** **Kasaragod** (481,707 km) and **Kottayam** (525,368 km) had the lowest total distance traveled.

2. Ambulance Operational Efficiency

By calculating the average distance per trip, we understand the typical travel requirements for each emergency call.

- **Longest Average Trips:** **Ernakulam** and **Wayanad** recorded the highest average distance per trip (56.29 km and 60.63 km respectively). This indicates that ambulances in these districts often had to cover longer distances for each call.
- **Shortest Average Trips:** **Kottayam** had the lowest average distance per trip (42.93 km), suggesting that their services were primarily for shorter, more localized emergencies.

3. Trip Type Breakdown (COVID-19 vs. Other Emergencies)

The data for 2021-22 shows a significant shift in the nature of emergencies compared to the previous year, with a notable increase in non-COVID-19 related calls.

- **High Proportion of 'Other Emergencies':** **Alappuzha** (71.66%) and **Thiruvananthapuram** (58.20%) had the highest percentage of trips for 'Other Emergencies'.
- **COVID-19 Dominance:** While the state-wide proportion of COVID-19 trips decreased from the previous year, they still constituted the majority of the trips in many districts, including **Ernakulam** (74.29%), **Palakkad** (82.61%), and **Kozhikode** (84.79%).
- **Cancelled Trips:** The total number of cancelled trips across all districts was **5,519**, with **Thiruvananthapuram** having the highest number (2,043). This figure is a key metric for evaluating operational efficiency and demand management.

2022-23

Total Workload: The state-wide total number of trips stood at **188,843**, covering **12,471,224 km**. This represents a continued decline in overall trip volume from the previous two years (241,952 in 2020-21 and 201,337 in 2021-22).

Trip Type: The most significant change is the breakdown of trip types. COVID-19 trips were almost non-existent, accounting for less than 1% of the total. Conversely, **'Other Emergencies' trips constituted 99.33%** of all calls, a stark contrast to the pandemic years.

Geographical Performance:

- **Thiruvananthapuram** was the busiest district, with **32,519 trips**, a number higher than its pre-pandemic peak in 2020-21.
- **Ernakulam** (20,381) and **Alappuzha** (18,146) also maintained high trip volumes.
- **Idukki** (5,253) and **Wayanad** (5,517) had the lowest number of trips.

Operational Efficiency: The average distance per trip showed a clear distinction. **Ernakulam** (69.72 km), **Idukki** (158.89 km), and **Kollam** (88.67 km) had significantly higher average distances, suggesting long-distance patient transfers were common. **Wayanad** (91.71 km) also maintained a high average distance despite low trip volume, likely due to its geographical terrain.

Post-Pandemic Shift: The most profound trend is the complete return to normalcy in trip composition.

- **2020-21:** Dominated by COVID-19 (86%)
- **2021-22:** A transitional year with a mix of COVID-19 (66%) and other emergencies.
- **2022-23:** The operational model is almost exclusively focused on 'Other Emergencies' (99.33%).

The data from 2022-23 confirms the full-scale recovery of ambulance services from the emergency state of the pandemic. While the total workload is lower than the unique pandemic peak, the service has successfully transitioned to handling a higher volume of non-COVID-19 emergencies than ever before. This trend suggests a healthy and sustainable demand for a more balanced and comprehensive emergency medical service system moving forward.

2023-24

Trip Volume: The statewide total number of trips increased to 199,316, a significant rise from the previous year. Thiruvananthapuram continued its role as the state's busiest district with 32,813 trips, followed by Ernakulam (22,211) and Thrissur (17,882).

Distance Traveled: The total distance covered was 12,767,089 km. Ernakulam (1,489,931 km) and Kollam (1,283,153 km) recorded the highest distances, while Kasaragod (516,600 km) and Wayanad (514,807 km) had the lowest.

Trip Type: The data confirms the near-total disappearance of the pandemic-specific workload. COVID-19 trips accounted for a mere 230 calls across the state, while 'Other Emergencies' constituted 99.88% of the total workload. This marks a complete return to a normal operational model.

Operational Efficiency: The number of cancelled trips remained relatively low and stable, at 6,744, suggesting consistent operational reliability despite the high workload.

The Complete Shift in Trip Composition

The most significant finding is the dramatic and sustained shift in the nature of emergency calls.

- In 2020-21, **COVID-19 trips were the dominant force** (86%).
- By 2023-24, **'Other Emergencies' trips constituted virtually all calls** (99.88%).

Thiruvananthapuram stands out with consistent trip volume growth, from 26,152 in 2020-21 to 32,813 in 2023-24. Similarly, **Ernakulam** saw its trip volume surge to its highest point at 22,211. This solidifies these districts as perennial high-demand centers.

2024-25

Trip Volume: A total of 193,647 trips were completed across the state.

- Thiruvananthapuram continued to be the busiest district, reaching its highest-ever trip volume with 33,427 calls.
- Ernakulam (21,611) and Thrissur (17,798) also remained high-demand districts.
- Kasaragod (6,892) and Wayanad (5,826) had the lowest number of trips.

Distance Traveled: Ambulances covered a total of 12,052,177 km. Ernakulam (1,362,428 km) and Thiruvananthapuram (1,208,921 km) recorded the highest distances, reflecting their large service areas and high trip volumes.

Trip Type: The data confirms that COVID-19 is no longer a factor in ambulance operations. Only one trip was reported in the entire state for this category, with all other calls falling under the 'Other Emergencies' category.

Operational Efficiency: The number of cancelled trips remained low at 5,638, which suggests a high level of operational efficiency and consistent service delivery.

Critical Evaluation of Five-Year Trends

The long-term data provides a clear narrative of the ambulance service's operational journey.

1. The Overall Workload Trend: A New Plateau

The total number of trips over the five-year period shows a distinct pattern: a pandemic peak followed by a stabilization at a new, high-demand level.

- **2020-21:** Peak workload with **241,952** trips, driven by the pandemic.

- **2021-22 to 2022-23:** A decline to a low of **188,843** trips as the pandemic waned.
- **2023-24:** A significant rebound to **199,316** trips, indicating a return to high demand.
- **2024-25:** A slight dip to **193,647** trips, suggesting the service may be settling on a new, high-volume plateau of operations. This level is significantly higher than pre-pandemic baselines for general emergency calls.

2. The Complete and Permanent Shift in Trip Composition

The most striking trend is the complete transformation of the service's focus.

- **2020-21:** The service was overwhelmed by COVID-19 trips, which made up **86%** of the total.
- **2024-25:** The service is almost exclusively dedicated to '**Other Emergencies**' (99.9%), a complete reversal of the pandemic model.

3. The Sustained and High Demand for Core Services

The total number of 'Other Emergencies' trips has consistently increased over the years, demonstrating a sustained and growing need for core emergency services.

- **2020-21:** 33,727 trips
- **2021-22:** 68,692 trips
- **2022-23:** 187,570 trips
- **2023-24:** 199,086 trips
- **2024-25:** 193,646 trips

While there was a minor decrease from 2023-24, the overall number remains remarkably high, illustrating that the ambulance service is now operating at a level of demand that is nearly six times higher than it was during the first year of the pandemic.

4. District-Level Trends

- **Thiruvananthapuram** has shown a remarkable and consistent growth trajectory, reaching its highest trip count in 2024-25.

- Districts like **Ernakulam** and **Alappuzha**, which saw a slight drop in 2024-25, remain significant high-volume service areas. The fluctuations in these districts are likely minor adjustments after the post-pandemic surge.

Attended and cancelled trips

2020-21

Overall Trip Status

- The vast majority of trips were attended, with an overall attendance rate of **97.29%**.

District-wise Trends

- **Trip Volume:** The district with the highest number of total trips was **Palakkad**, with 31,030 trips. The second highest was **Thiruvananthapuram**, with 26,152 trips.
- **Cancellation Rate:** **Thiruvananthapuram** had the highest cancellation rate at **7.17%**, which is significantly higher than the average.
- **Lowest Cancellations:** **Palakkad** had the lowest cancellation rate, with only **0.54%** of trips being cancelled.

Peak vs. Off-Peak Periods

- **Attended Trips:** There were significantly more attended trips during peak hours, with a ratio of approximately **4.46 peak trips for every 1 off-peak trip**.
- **Cancelled Trips:** Similarly, a higher number of cancellations occurred during peak hours, with a ratio of **2.63 peak cancellations for every 1 off-peak cancellation**. This suggests that while more trips happen during peak hours, the cancellation rate during this time is also disproportionately high.

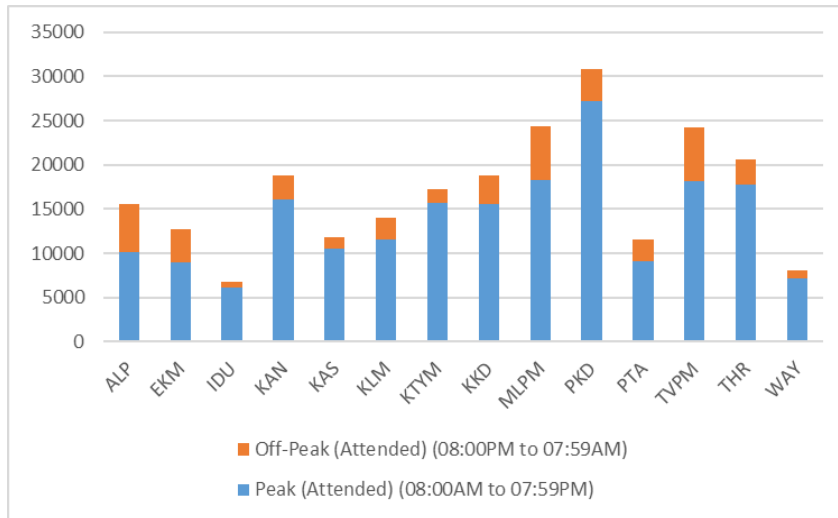


Figure 14: Number of Attended Emergency Calls During Peak and Off-Peak Hours by District

2021-22

Overall Trip Status

- The total number of trips decreased from 241,952 in 2020-21 to 201,337 in 2021-22.
- The percentage of trips attended was **96.26%**, a slight decrease from the previous year.

District-wise Trends

- **Trip Volume:** The district with the highest total trips was **Thiruvananthapuram**, with 26,858 trips.
- **Cancellation Rate:** **Thiruvananthapuram** also had the highest cancellation rate at **10.68%**, a significant increase from the previous year.
- **Lowest Cancellations:** **Wayanad** had the lowest cancellation rate, with only **1.39%** of trips being cancelled.

Peak vs. Off-Peak Periods

- **Attended Trips:** Attended trips during peak hours were approximately **2.79 times higher** than during off-peak hours.

- **Cancelled Trips:** Cancellations were also higher during peak hours, with a ratio of **1.78 peak cancellations for every 1 off-peak cancellation.**

2022-23

Total Trips by District

- **Thiruvananthapuram** recorded the highest number of total trips with 32,519, followed by **Ernakulam**.
- The lowest number of total trips were in **Idukki** and **Wayanad**.

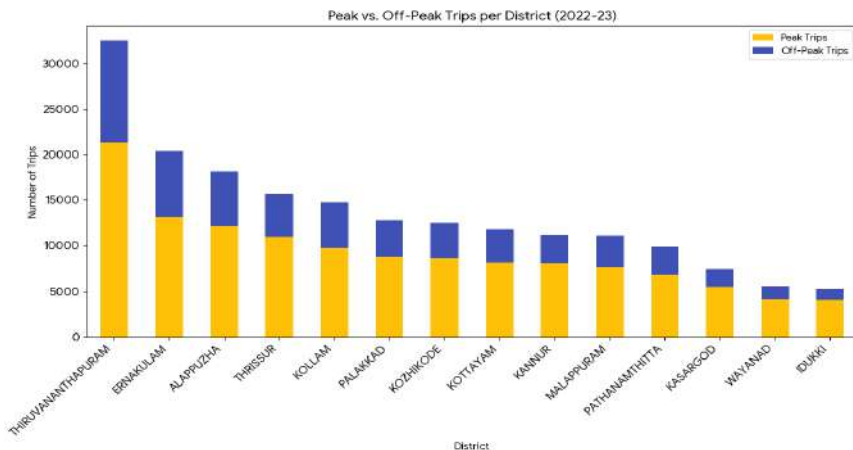


Figure 15: Distribution of Emergency Trips During Peak and Off-Peak Hours by District (2022-23)

Trip Status Breakdown (Attended vs. Cancelled)

- State-wide, the service maintains a high attended trip rate, with a very small percentage of total trips being cancelled. The total cancellation rate is 2.91%.
- **Thiruvananthapuram** had the highest number of cancellations with 2,003, accounting for 36.33% of total cancellations in the state.
- **Kasaragod** and **Idukki** had the lowest cancellation rates at 1.21% and 1.39%, respectively, indicating higher efficiency.

Peak vs. Off-Peak Trip Breakdown

- There is a higher demand for ambulance services during **peak hours** (8:00 AM to 7:59 PM) compared to off-peak hours (8:00 PM to 7:59 AM) across all districts.
- Peak hours accounted for approximately 70% of total trips, while off-peak hours accounted for the remaining 30%.

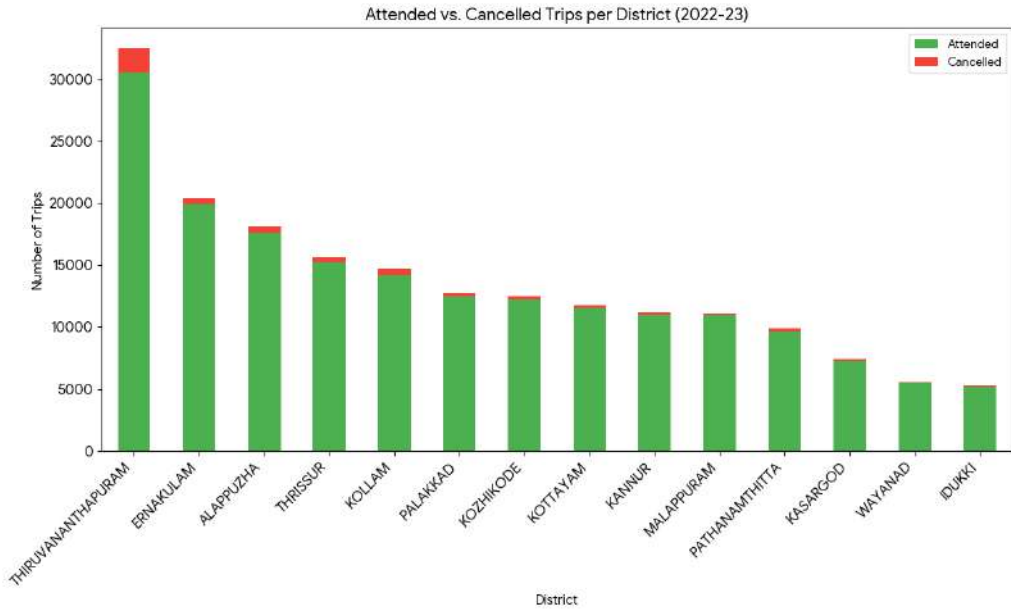


Figure 16: Distribution of Attended vs. Cancelled Emergency Trips by District (2022-23)

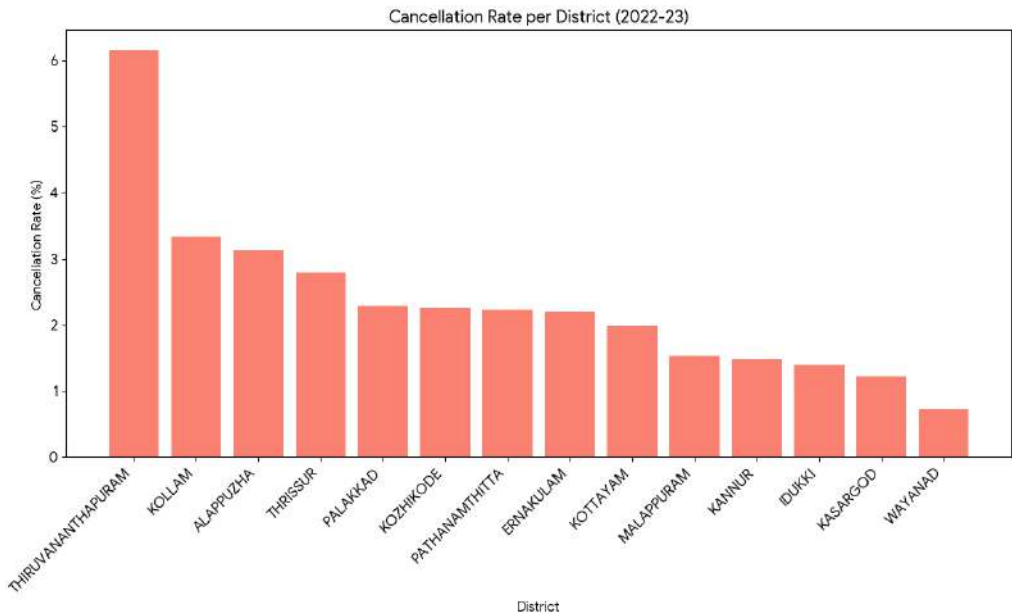


Figure 17: Cancellation Rate of Emergency Trips by District (2022-23)

2023-24

Total Trips: Thiruvananthapuram continues to lead with the highest number of trips (32,813), followed by Ernakulam (22,211). The districts with the lowest number of trips are Idukki (5,674) and Wayanad (6,091).

Trip Status: The cancellation rate for the state as a whole increased slightly to 3.20% from 2.91% in the previous year. Thiruvananthapuram and Ernakulam had the highest number of cancelled trips.

Demand Trends: The trend of higher demand during peak hours (08:00 AM to 07:59 PM) persists, accounting for approximately 70% of total trips.

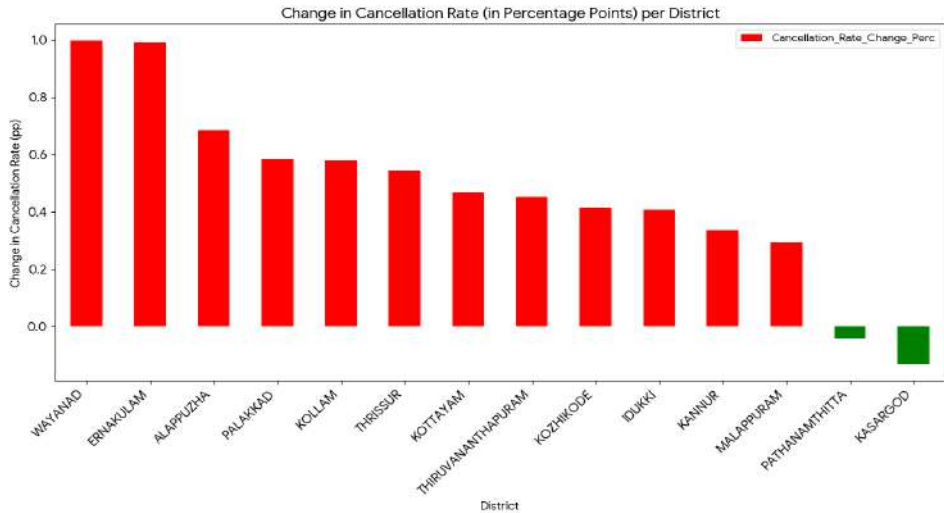


Figure 18: Change in Emergency Trip Cancellation Rate (in Percentage Points) per District

2024-25

Total Trips: The state-wide total number of trips remained stable, with a slight decrease of 0.2% from 2023-24 to 2024-25. Thiruvananthapuram continues to have the highest number of trips (33,427).

Trip Status: The overall cancellation rate for the state decreased slightly from 3.20% in 2023-24 to 2.89% in 2024-25. **Thiruvananthapuram** and **Kollam** showed the most significant decrease in their cancellation rates.

Demand Trends: Higher demand during peak hours persists, with the majority of trips occurring between 08:00 AM and 07:59 PM.

Year-on-Year Comparison (2023-24 vs. 2022-23)

Overall Trip Volume: Total trips across the state increased by 6.09%, from 188,843 to 206,126.

Growth by District:

- **Thrissur** showed the highest absolute increase in total trips, with 2,212 more trips in 2023-24.

- **Ernakulam** and **Kozhikode** also experienced significant growth, with an increase of 1,830 and 2,603 trips, respectively.
- **Alappuzha** was the only district to see a decrease in total trips, dropping by 710.

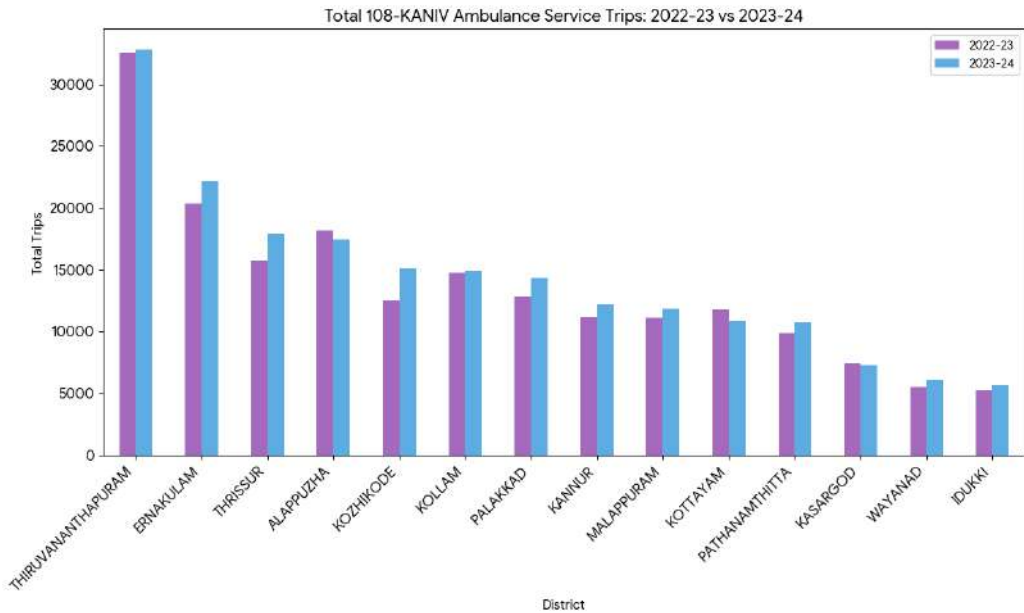


Figure 19: Comparison of Total KANIV-108 Ambulance Service Trips per District, 2022-23 vs 2023-24

Three-Year Comparison (2022-23 to 2024-25)

Total Trip Growth: After a significant increase of 6.09% from 2022-23 to 2023-24, the total number of trips across the state stabilized in 2024-25, showing a marginal decrease of 0.2%.

District-Level Performance:

- **Kozhikode** experienced a significant increase in total trips for the third consecutive year, with a 9.45% growth from 2023-24 to 2024-25.
- **Alappuzha** and **Kottayam** continued their declining trend in total trips.
- **Thiruvananthapuram** and **Ernakulam** consistently remained the top two districts in terms of total trips over the three-year period.

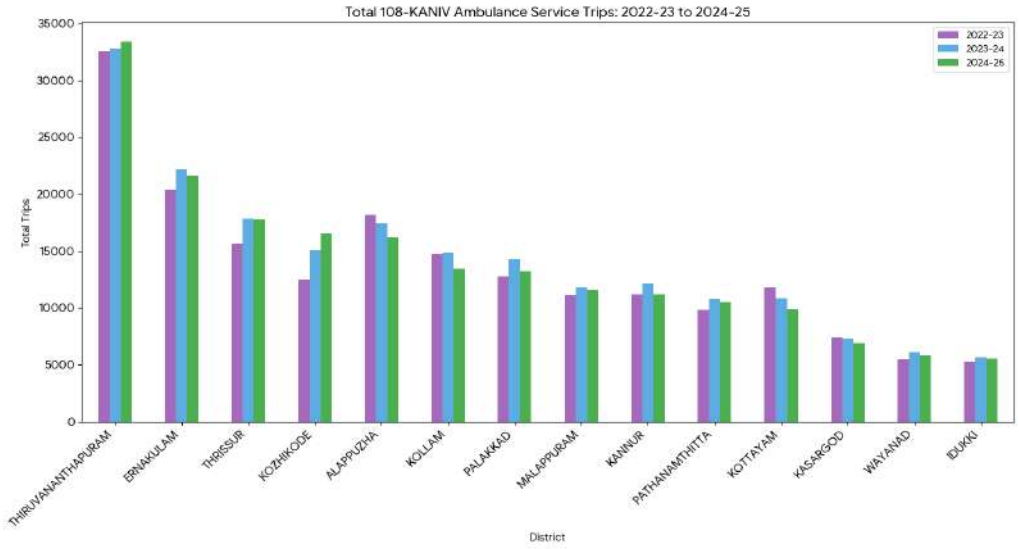


Figure 20: Comparison of Total KANIV-108 Ambulance Service Trips per District, 2022-23 to 2024-25

Total trips, achievement percentage (trips achieved out of total), and average response time.

Detailed breakdown of achievements by district for the year 2020-21

- **Overall Performance:** The achievement percentages vary significantly across districts, ranging from a low of 62.9% in Thrissur to a high of 86.8% in Wayanad. This indicates a wide disparity in service efficiency.
- **Top Performers (by achievement percentage):**
 - **Wayanad** stands out with the highest achievement rate at 86.8%.
 - **Palakkad** (82.9%) and **Kottayam** (82.6%) also show excellent performance, achieving over 80% of their total trips.
- **Lowest Performers (by achievement percentage):**
 - **Thrissur** has the lowest achievement rate at 62.9%.
 - **Kollam** (66.7%) and **Kannur** (72.5%) also fall into the lower end of the spectrum.
- **Response Time Analysis:**
 - **Palakkad** boasts the fastest average response time at just 10 minutes and 58 seconds, which correlates with its high achievement percentage.
 - **Pathanamthitta** (11:17) and **Alappuzha** (12:13) also demonstrate very quick response times.
 - **Idukki** has the longest average response time at a significant 23 minutes and 41 seconds. This is likely due to the geographical challenges of the district.
 - **Thrissur** also has a very long average response time of 19 minutes and 26 seconds, which likely contributes to its low achievement rate.
- **Trip Volume:**
 - **Palakkad** has the highest number of total trips (31,030), and it manages to maintain a high achievement percentage and the best response time, indicating robust and efficient operations.

- **Thiruvananthapuram** (26,152), **Malappuram** (24,936), and **Thrissur** (20,791) also handle a large volume of trips.

Correlations:

- A strong negative correlation appears to exist between average response time and achievement percentage. Districts with shorter response times (e.g., Palakkad, Pathanamthitta) tend to have higher achievement rates. Conversely, districts with longer response times (e.g., Idukki, Thrissur, Malappuram) generally have lower achievement percentages.
- The volume of trips does not seem to be a direct predictor of performance. While Palakkad handles the most trips efficiently, other high-volume districts like Thrissur and Thiruvananthapuram have relatively low achievement rates.

The data highlights significant operational differences across the districts. **Palakkad** and **Wayanad** are the clear top performers, with Palakkad being particularly impressive for handling the highest volume of trips with the quickest response time and a very high achievement rate.

On the other hand, **Thrissur** and **Kollam** show the lowest performance, with Thrissur having the lowest achievement rate and a very long response time. **Idukki's** extended response time is notable and likely a factor of its geography, which presents a unique challenge for service delivery.

Overall, the average response time appears to be a critical factor influencing the achievement percentage, suggesting that improving response times would be a key strategy for districts looking to boost their performance.

Detailed breakdown of achievements by district for the year 2021-22

Correlation Analysis

The correlation coefficient between the percentage of achieved trips and the average response time is approximately -0.42. This indicates a moderate negative correlation. In general, districts with a higher percentage of achieved trips tend to have faster response times, although the relationship is not extremely strong.

Performance Rankings

Here is a breakdown of the districts ranked by each metric:

Districts ranked by Percentage of Achieved Trips (Highest to Lowest):

1. Wayanad (82.7%)
2. Kozhikode (81.6%)
3. Kottayam (79.8%)
4. Malappuram (79.2%)
5. Kasaragod (76.8%)

Districts ranked by Average Response Time (Fastest to Slowest):

1. Kozhikode (10:36)
2. Malappuram (10:48)
3. Kottayam (11:10)
4. Kasaragod (12:36)
5. Palakkad (13:35)

Key Insights

- **Top Performers:** Districts like **Kozhikode**, **Malappuram**, and **Kottayam** demonstrate strong performance in both metrics, ranking high for both percentage of achieved trips and having fast response times.
- **Areas for Improvement:** **Pathanamthitta** has the lowest percentage of achieved trips and a relatively slow response time. **Idukki** has the slowest response time, despite having a moderate percentage of achieved trips.
- **Outlier:** **Wayanad** is an interesting case, as it has the highest percentage of achieved trips but a slower-than-average response time. This suggests that while they are successfully completing a high number of trips, factors such as geographical terrain might be impacting their speed.

The scatter plot below visually represents the relationship between the two key performance indicators. The districts that fall in the top-left quadrant are the most efficient (high percentage of achieved trips with fast response times).

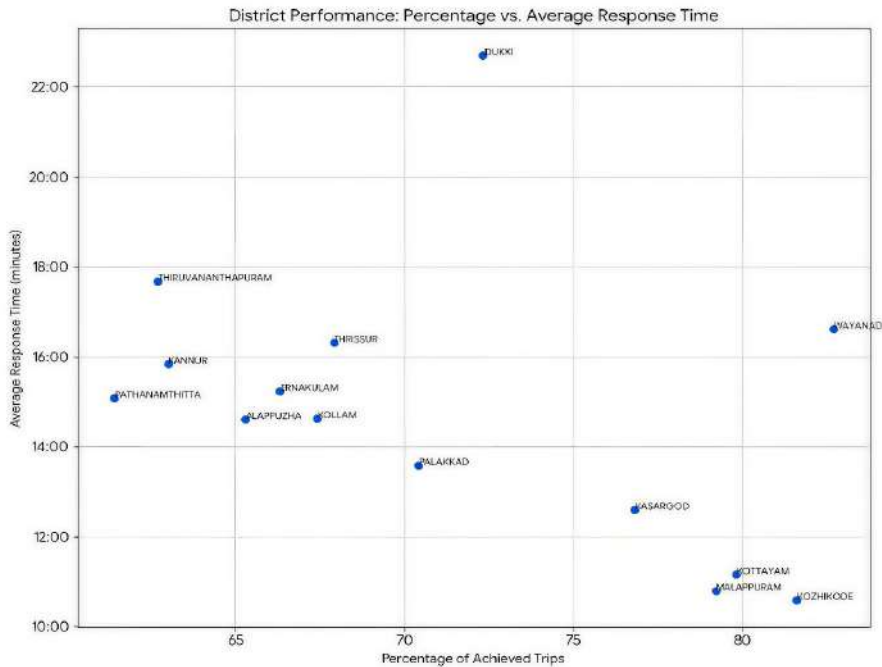


Figure 21: District Performance: Relationship Between Percentage of Trips Achieved and Average Response Time

Detailed breakdown of achievements by district for the year 2022-23

Correlation Analysis

The correlation coefficient between the percentage of achieved trips and the average response time is approximately -0.47. This indicates a moderate negative correlation. This is a slightly stronger correlation than the previous year, suggesting that as districts increase their efficiency in achieving trips, their response times generally improve. **Performance Rankings**

Districts ranked by Percentage of Achieved Trips (Highest to Lowest):

1. Wayanad (93.1%)
2. Thrissur (89.2%)
3. Kozhikode (87.4%)
4. Thiruvananthapuram (87.1%)
5. Palakkad (85.9%)

Districts ranked by Average Response Time (Fastest to Slowest):

1. Thrissur (07:58)
2. Kozhikode (09:07)
3. Palakkad (09:10)
4. Malappuram (09:21)
5. Kottayam (09:36)

Key Insights

- **Top Performers:** **Thrissur**, **Kozhikode**, and **Palakkad** stand out as top performers. They all rank in the top five for both the percentage of achieved trips and the average response time, indicating high efficiency and rapid service.
- **Wayanad:** Wayanad has the highest percentage of achieved trips at 93.1%, but its response time is slower than many other high-performing districts.
- **Areas for Improvement:** **Ernakulam** has the lowest percentage of achieved trips at 72.3%, and its response time is slower than the majority of the other districts. **Idukki** has the slowest response time at 16:19, even though its percentage of achieved trips is higher than some of the districts with faster response times.

The scatter plot below visually represents the relationship between the two key performance indicators. The districts that fall in the top-left quadrant are the most efficient (high percentage of achieved trips with fast response times).

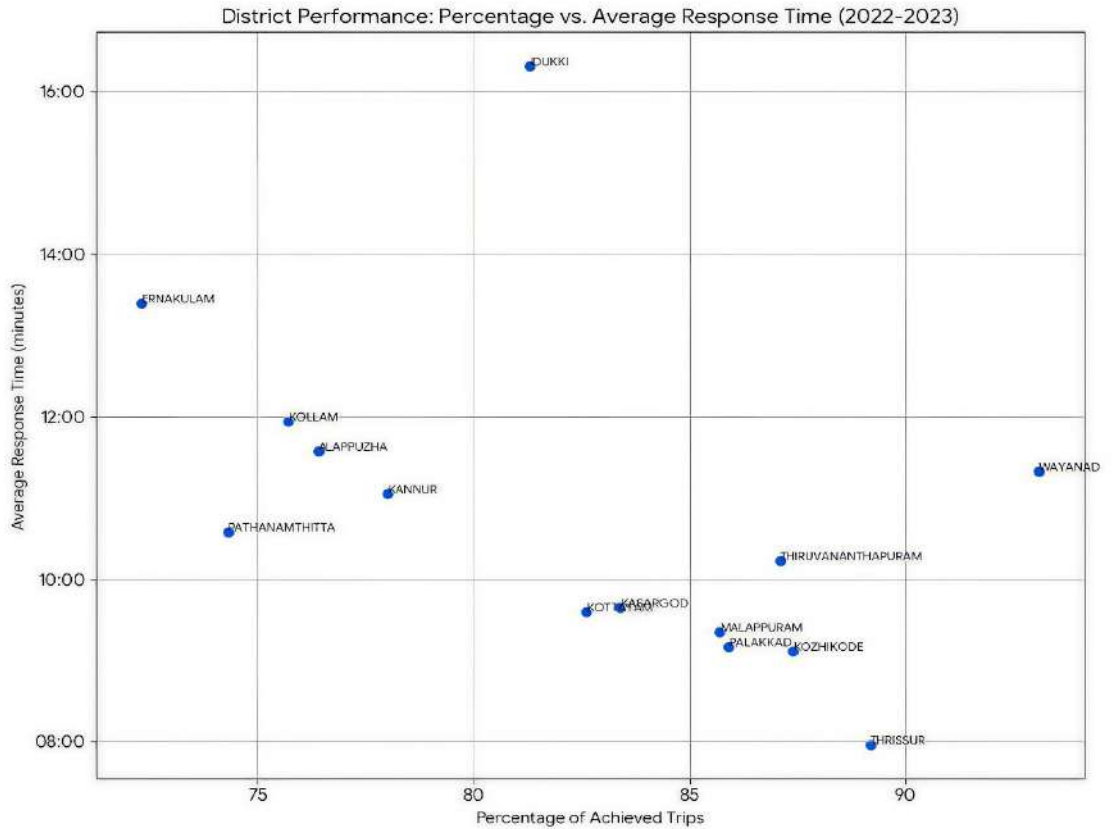


Figure 22: District Performance: Percentage of Achieved Trips vs. Average Response Time (2022-2023)

Detailed breakdown of achievements by district for the year 2023-24

The analysis shows a **moderate negative correlation** (approximately -0.42) between the percentage of achieved trips and the average response time. This means that districts with a higher success rate in completing trips generally have faster response times.

Performance Rankings (2023-2024)

Districts with the Highest Percentage of Achieved Trips:

1. **Wayanad** (90.8%)
2. **Thrissur** (88.5%)
3. **Malappuram** (87.8%)

Districts with the Fastest Average Response Time:

1. **Thrissur** (08:59)
2. **Palakkad** (09:23)
3. **Malappuram** (09:40)

Key Insights

- **Consistent High Performers: Thrissur** and **Malappuram** continue to show exceptional performance, ranking in the top three for both their percentage of achieved trips and their average response time. This suggests a highly efficient and reliable ambulance service in these districts.
- **Top Achiever with Slower Response: Wayanad** leads in the percentage of trips achieved, but its average response time is slower than the overall average. This could be due to factors like geographical terrain or sparse population density, which may not affect the trip completion rate but can increase travel time.
- **Areas for Improvement: Kollam** has the lowest percentage of achieved trips (70.7%) and a slower response time. **Ernakulam** and **Pathanamthitta** also rank in the bottom tier for both metrics, indicating that these districts face challenges with efficiency and speed. **Idukki** has the slowest response time in the state at 17:21.
- **Overall Trend:** Compared to previous years, a significant number of districts are achieving a high percentage of trips, with nine districts now above the 80% mark. The average response times are also generally faster across the state.

Districts with the Fastest Average Response Time:

1. **Thrissur** (08:36)
2. **Malappuram** (08:43)
3. **Palakkad** (09:12)

Key Insights

- **Consistent Top Performers: Thrissur, Malappuram, and Palakkad** continue to demonstrate excellent performance. Thrissur ranks first for both response time and trip completion percentage, solidifying its position as the most efficient district. Malappuram and Palakkad are also consistently in the top tier for both metrics.
- **The "Wayanad-Idukki" Outlier:** Wayanad and Idukki stand out as outliers. Both districts have a high percentage of achieved trips (92.0% and 86.1%, respectively), but their response times are among the slowest in the state (14:00 and 14:24). This pattern suggests that while ambulance services in these districts are highly effective at reaching their destinations, external factors like geographical challenges or road conditions likely impact travel speed.
- **Significant Improvement: Ernakulam** has shown significant improvement, with its percentage of achieved trips increasing to 87.1% and its average response time dropping to 11:16. This is a notable positive trend from its lower rankings in previous years.
- **Areas for Improvement: Kollam** consistently ranks at the bottom for the percentage of achieved trips, with a rate of only 69.9% this year. This, along with a slow response time, indicates a persistent need for service improvement in this district. **Kannur** and **Pathanamthitta** also show lower percentages of trips achieved compared to the state's average.

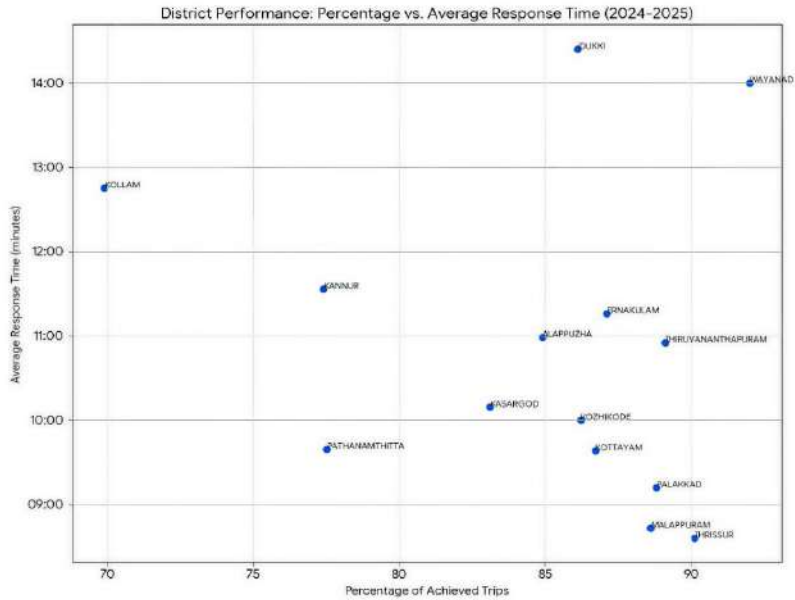


Figure 24: District Performance: Percentage of Achieved Trips vs. Average Response Time (2024-2025)

Long-term trend analysis

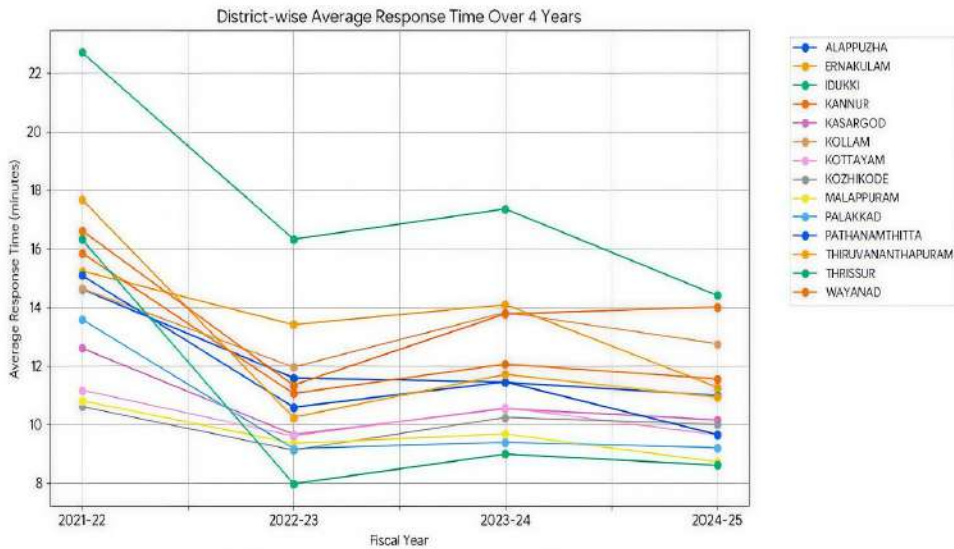


Figure 25: District-wise Average Response Time for KANIV-108 Emergency Trips, 2021-2025

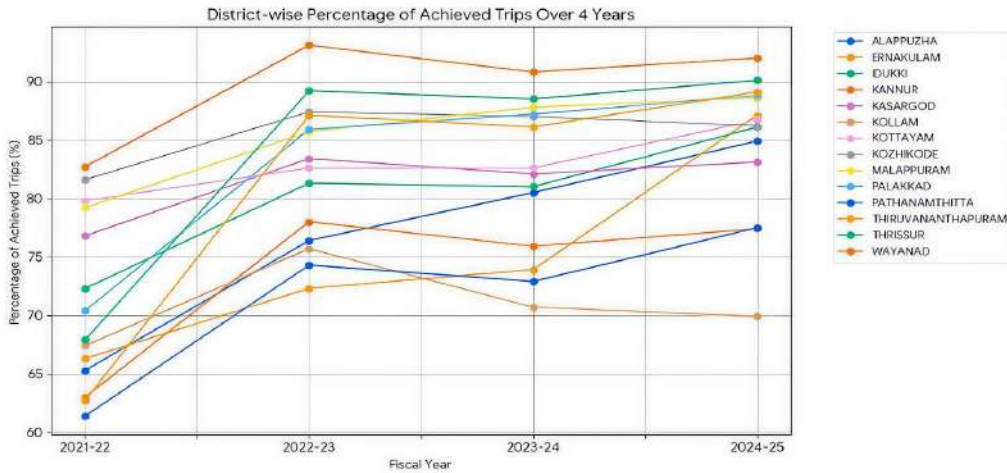


Figure 26: District-wise Percentage of Achieved KANIV-108 Trips, 2021-2025

Overall Improvement: There is a clear and consistent statewide trend of improvement. The percentage of achieved trips has increased for almost every district, and average response times have decreased significantly across the board, demonstrating a greater efficiency and reach of the ambulance service.

Districts with the Most Significant Improvements

- Thiruvananthapuram:** This district showed the most significant improvement in its trip achievement rate, with a **26.4% increase** from 62.7% in 2021-2022 to 89.1% in 2024-2025. Its average response time also improved by over 6 minutes.
- Thrissur:** This district demonstrated remarkable improvement on both fronts, with a **22.2% increase** in its achievement rate and the second-best improvement in average response time, which decreased by over 7 minutes. Thrissur has consistently been a top performer in recent years.
- Ernakulam, Alappuzha, and Palakkad:** These districts have also shown substantial improvement, with increases in their achievement rates by over 18 percentage points and significant decreases in their response times, indicating a broad-based improvement in service quality.

Districts with Consistent Challenges

- **Kollam:** This district has consistently ranked at the bottom for its percentage of achieved trips throughout the four-year period. While it saw some improvement in response time, its achievement rate remained a concern.
- **Idukki:** Despite improving its response time by over 8 minutes, Idukki consistently has the slowest average response time each year. This suggests that while it is becoming more efficient, the unique geographical challenges of the district continue to impact overall speed.

Financial details

Table 6: The rate offered by M/s. GVK EMRI for five years as per the tender is given below

Year	Particulars	Quantity	Cost of operation per ambulance in Rs
1	Expense for operating one ambulance 24 hours per day as per the conditions stipulated in the tender for a period of one month - Year I	150	2,70,000
	Expense for operating one ambulance 12 hours per day as per the conditions stipulated in the tender for a period of one month - Year I	165	1,82,700
2	Expense for operating one ambulance 24 hours per day as per the conditions stipulated in the tender for a period of one month - Year II	150	2,97,000
	Expense for operating one ambulance 12 hours per day as per the conditions stipulated in the tender for a period of one month - Year II	165	2,00,970
3	Expense for operating one ambulance 24 hours per day as per the conditions stipulated in the tender for a period of one month - Year III	150	3,26,700
	Expense for operating one ambulance 12 hours per day as per the conditions stipulated in the tender for a period of one month - Year III	165	2,21,067

4	Expense for operating one ambulance 24 hours per day as per the conditions stipulated in the tender for a period of one month - Year IV	150	3,59,370
	Expense for operating one ambulance 12 hours per day as per the conditions stipulated in the tender for a period of one month - Year IV	165	2,43,147
5	Expense for operating one ambulance 24 hours per day as per the conditions stipulated in the tender for a period of one month - Year V	150	3,95,307
	Expense for operating one ambulance 12 hours per day as per the conditions stipulated in the tender for a period of one month - Year V	165	2,67,491

Reimbursement for Extra Kilometers

The reimbursement rate for additional kilometers traveled beyond the monthly limit is **₹15 per kilometer**.

This offer applies to each ambulance, with the monthly limit set at **1,000 kilometers per ambulance**. The total number of ambulances in the fleet is **315**.

The calculation for reimbursable additional kilometers is performed on a quarterly basis using the following formula:

$$\text{Reimbursable Kilometers} = (\text{Total distance traveled by all ambulances in the quarter}) - (315 \times 1,000 \times 3)$$

Main Penalty Clauses for the Operation

As per the Tender clause 5.14.4, if 99% ambulances are not up, penalty will be imposed per Ambulance as per the table detailed below:

Table 7: Penalties Imposed for Ambulance Breakdown Time

Sl. No.	Period of breakdown	Penalty imposed
1	Up to 12 hours	One-day opex
2	12 to 24 hours	Two-day opex
3	>24 hours	Will be proportionate in accordance with the above slabs.

Later Government revised Penalty Slab as per the Government Letter No. P1A/87/2021/H&FWD dated 12.05.2021

Table 8: Penalty Structure Based on Duration of Breakdown

Period of Breakdown	Penalty Imposed
0-1 Hour	No penalty
1-3 Hours	25% of operating cost for a day
3-6 Hours	50% of operating cost for a day
6-9 Hours	75% of operating cost for a day
9-12 Hours	One day operating cost
12-15 Hours	125% of operating cost for a day
15-18 Hours	150% of operating cost for a day
18-21 Hours	175% of operating cost for a day
21-24 Hours	Operating cost for two days

Response time Penalty

The bidder shall maintain

- a response time of 15 minutes for urban areas,
- a response time of 20 minutes for rural areas,
- a response time of 30 minutes for difficult terrain areas.

All the vehicles attached to primary health centres and CHC's will be considered as vehicles in rural areas and all vehicles attached to all higher health facility centre above CHC will be considered as urban area vehicles. Considering the geographic terrain, all ambulances proposed to be operated as part of the project in Idukki and Wayanad Districts shall be considered as vehicles operating in difficult terrain areas.

The response time as per clause 5.6.2 shall be met with 80% of the cases in a given quarter. If this condition is not adhered, the penalty calculation will be as follows.

Table 9: Penalties Based on Quarterly Performance Percentage

% for a Quarter	Deductions
75 – 79.9	5% on the bill raised for the Quarter
70 – 74.9	10% on the bill raised for the Quarter
65 – 69.9	15% on the bill raised for the Quarter
60 – 64.9	20% on the bill raised for the Quarter
55 – 59.9	25% on the bill raised for the Quarter
50 – 54.9	30% on the bill raised for the Quarter
<50	50% on the bill raised for the Quarter

This deduction system is a strong incentive for maintaining high performance. By tying financial penalties directly to performance levels, it encourages better results and accountability. The gradual increase in deductions at each tier motivates the vehicles to stay in a higher performance bracket. The jump from a 15% deduction to a 20% deduction, for example, is a powerful incentive to improve even slightly to avoid a larger penalty.

Funds for operation

Each year, a proposal is submitted to the National Health Mission (NHM) for the allocation of funds to support the emergency ambulance service operations under the Programme Implementation Plan (PIP). Currently, the operational rate per ambulance stands at ₹1.37 lakhs per month.

To cover the remaining operational requirements, a separate proposal is submitted to the Directorate of Health Services (DHS), which is anticipated to be provided from the State Plan Fund. The cumulative funds received from NHM and DHS for ambulance operations over recent years are summarized below.

Table 10: Annual Funding Received from DHS and NHM for KANIV-108 Ambulance Operations

FY	DHS	NHM	Total
2019-20	10,62,24,490	-	10,62,24,490
2020-21	37,31,66,000	42,53,12,540	79,84,78,540
2021-22	72,52,16,581	47,75,26,516	1,20,27,43,097
2022-23	58,57,85,117	45,31,82,649	1,03,89,67,766
2023-24	91,24,42,540	33,90,34,133	1,25,15,36,873
2024-25	-	13,50,00,000	13,50,00,000
Total	2,70,28,34,728	1,83,01,16,038	4,53,29,50,766

DHS contributions have been substantial, peaking at ₹91,24,42,540 in 2023-24, while NHM support has gradually increased, reaching ₹47,75,26,516 in 2021-22 and a final allocation of ₹13,50,00,000 in 2024-25. Together, these allocations have resulted in a cumulative total of ₹4,53,29,50,766, with DHS providing ₹2,70,28,34,728 and NHM contributing ₹1,83,01,16,038 throughout the reporting period.

The Role of KANIV-108 During the COVID-19 Pandemic (2021-2022)

This section will document the vital contribution of the Kerala Ambulance Network for Injured Victims (KANIV-108) in managing the healthcare demands of the COVID-19 pandemic during the years 2021 and 2022. During this period, the ambulance network shifted its primary focus from trauma and accident care to becoming a dedicated fleet for pandemic-related emergency services.

Reorientation of Services and Fleet Deployment

- **Shift in Focus:** KANIV-108, originally established for trauma care, was repurposed to handle COVID-19-related emergencies. This included transporting COVID-positive patients, moving individuals from their homes to quarantine or care centers, and facilitating inter-hospital transfers for specialized treatment.
- **Dedicated Fleet:** A significant portion of the KANIV-108 fleet was exclusively dedicated to COVID-19 duties. By June 2021, approximately 290 out of the 316 ambulances were engaged in COVID-related work.
- **Preparedness for Subsequent Waves:** Recognizing the threat of subsequent waves of the pandemic, particularly the third wave, the entire fleet of 316 KANIV-108 ambulances and its 1,500 employees were prepared and on standby to be fully deployed for COVID-19-related services if needed.

On January 29, 2020, GVK EMRI deployed India's first 108 ambulance dedicated to COVID-19 at Thiruvananthapuram International Airport. Despite the challenges of the pandemic, 316 of its ambulances continue to provide uninterrupted service. The **KANIV 108** ambulances and their staff have been instrumental in frontline activities during both the COVID-19 pandemic and the Nipah virus outbreak in the state.

In March 2020, the General Manager of KMSCL issued a general order to GVK-EMRI concerning the COVID-19 pandemic. The order requested that vehicles be dispatched as needed by the District Administration without waiting for KMSCL's concurrence. The recipients were instructed to send an email to KMSCL after fulfilling each request.

The organization fully committed its ambulances and staff to support the Health Department and District Administration in their efforts to combat these public health crises. This led to a significant change in the scope of its services, with 90% of its

ambulances being utilized for COVID-19 operations, primarily dispatched by District COVID cells. To date, their ambulances have been used for 345,897 trips related to COVID-19 emergencies and 244 trips for transporting Nipah virus suspects.

Their dedicated crews have assisted with 130 deliveries, including three for COVID-19 victims. This highlights the project's crucial role in providing emergency medical assistance to the people of Kerala.



Figure 27: An EMT from the 108 ambulance service assists with a successful delivery, demonstrating the service's role in handling sensitive medical emergencies and ensuring safe childbirth.



Figure 28: A KANIV-108 ambulance crew reaches a patient in a remote, difficult-to-access area, highlighting their commitment to providing emergency services in all conditions, even during public health crises like the Nipah virus and COVID-19.

Special Operations at Sabarimala

During the Sabarimala pilgrimage, the Health Department, in collaboration with the KANIV 108 ambulance project, has deployed several specialized medical units to assist devotees.

Medical Facilities and Services

In addition to the regular health department ambulances, a KANIV 108 ambulance, a rescue van capable of navigating dense forest paths, and a bike feeder ambulance have been stationed to provide medical assistance. The bike feeder ambulance, driven by a trained emergency medical technician, features a sidecar for patient transport. An ICU ambulance, equipped with a defibrillator and ventilator, is also available to transport critically ill patients to other hospitals.

A rapid-action medical unit has been launched specifically to attend to devotees with cardiac issues during the trek from Pamba to the Swami Ayyappa Temple. This unit operates under the KANIV 108 project, with Pamba Hospital as its base. The rescue van, also part of this unit, is based in Appachimedu and staffed by a trained emergency medical technician.

The hospitals in Pamba and Sannidhanam have all necessary medical facilities. Along the forest path from Pamba to Sannidhanam, there are 18 emergency medical centers and oxygen parlors. Devotees in need of emergency medical services can dial the toll-free number 108 or contact 04735 203232. Sufficient medicines and other medical equipment are available for emergency care.



Figure 29: Kerala's KANIV 108 emergency services launch specialized vehicles, including an ambulance, a rescue van, and a bike feeder ambulance, to provide medical assistance for the Sabarimala pilgrimage.

Scooter First Responders for the Attukal Ponkala Festival

In 2020, to address the challenges of navigating crowded areas during the famous Attukal Ponkala Festival, scooter ambulances were deployed as first responders. An Emergency Response Center (ERC) was established at Attukal to manage the deployment of both ambulances and medical first responders.

Previous festivals had experienced delays in ambulance dispatch due to network traffic and technical issues with telephone communications. To overcome this, a **VHF communication** system was identified as the most suitable solution for efficient emergency deployment. The district collector authorized the deployment of approximately **15 licensed Ham radio operators** from the Radio Amateur Society of Ananthapuri to establish a two-way communication network for the event.

Five scooter ambulances, staffed by trained Emergency Medical Technicians (EMTs), served as the primary first responders. These scooter ambulances, equipped with an emergency medical first-aid bag and necessary medicines, were flagged off by the Honorable Health Minister. Their role was to quickly reach the scene of an incident, provide initial first aid, and then request a standard ambulance from the Attukal ERC to transport the victim to a hospital if needed.



Figure 30: Scooter Ambulances were deployed for the Attukal Ponkala Festival in Kerala

For the 2025 Attukal Ponkala Festival, a specialized emergency medical response plan was implemented to address the unique challenges of managing a large crowd. To avoid the logistical difficulties and risks associated with operating larger ambulances in congested areas, a fleet of five scooter ambulances was deployed as first responders. These agile vehicles, staffed by trained Emergency Medical Technicians (EMTs), were essential for navigating through the dense crowds to provide rapid initial care.

The deployment, which also included one ALS (Advanced Life Support) ambulance and one Gurkha Special Rescue vehicle, was officially flagged off by the Honorable Minister for Food and Civil Supplies, G. R. Anil.

In addition to the mobile units, an Oxygen and First Aid Point was established near Nadapanthal. This static medical post was set up in accordance with instructions from the revenue minister and the State Disaster Management authority. It was designed to provide immediate access to basic medical care, including oxygen and first aid, for pilgrims who might experience health issues during the festival. This strategic, multi-pronged approach ensured that emergency medical services could be delivered efficiently and effectively, safeguarding the well-being of all attendees.



Figure 31: Scooter ambulances were flagged off by the Hon. GR Anil, Hon. Minister for Food and Civil Supplies.

Pre-Hospital Arrival Notification System

GVK EMRI in collaboration with the state government has developed a **pre-hospital arrival notification system** that provides real-time alerts to hospitals when a KANIV 108 ambulance is en route with a patient. This innovative system aims to significantly reduce delays in providing timely care, particularly in critical casualty cases.

Pilot Project at Thiruvananthapuram Medical College

As a pilot initiative, GVK EMRI, in collaboration with the Health Department, installed this new system in the Emergency Medicine Department of Thiruvananthapuram Government Medical College Hospital (MCH). The facility was officially inaugurated by Health Minister Veena George on March 11. The system is designed to improve trauma care management by alerting the Emergency Medicine department as soon as a KANIV 108 ambulance begins transporting a patient from the field. It also relays vital patient information to the hospital, including the patient's name, age, and address. The system, which relies on a **GPS system** fitted in the ambulances, also provides an estimated time of arrival.

According to the Health Minister, this new system is expected to minimize hospital delays upon patient arrival. The project has been a success, with plans to expand its implementation to other major hospitals across the state. This initiative underscores EMRI's dedication to leveraging technology to save lives and enhance the efficiency of emergency medical care.



KANIV-108's Crucial Role in Kerala's Emergency Responses

The KANIV-108 ambulance service has provided vital support during major incidents, including the natural disaster at Pettimudi. The service was also instrumental during the plane crash at Karipur airport. In response to the crash, 46 KANIV-108 ambulances from the Kozhikode and Malappuram districts were deployed, with 96 staff members participating in the rescue mission. These ambulances transported 36 injured passengers to the hospital while providing them with medical aid.

The Air India Express IX 1344 Crash

On August 8, 2020, at approximately 7:45 PM, Air India Express flight IX 1344, carrying 190 people from Dubai, overshot the tabletop runway at Karipur and fell 35 feet into a gorge. The accident resulted in the deaths of 18 individuals, including the pilot and co-pilot, and left over 140 injured.

In response to the severity of the crash, a total of 46 ambulances were dispatched to the site, with 32 arriving from the Kozhikode district. They reached the scene within 30 minutes. Pilots and Emergency Medical Technicians (EMTs) were instructed to take precautionary measures as the flight was part of the Vande Bharat mission, which was evacuating Indians from abroad due to COVID-19.

A 96-member crew was deployed to provide medical aid. As survivors were rescued from the aircraft, they received first aid from the crew before being transported to nearby hospitals. Two Emergency Management Executives were also sent to the location to coordinate rescue operations with local authorities. The team provided medical aid to 36 individuals, including children. Additionally, ten ambulances from the Kannur district



were kept in reserve to handle inter-facility transfers (IFT) from the hospitals where the injured were admitted.

Pettimudi Landslide

On August 7, 2020, a landslide occurred at the Pettimudi division of the Neymakkad estate in the Rajamalai area of Idukki District, burying the estate lanes where 20 families resided. The landslide struck at midnight, trapping the families under mud and debris.

Due to the difficult terrain and heavy rainfall, rescue teams, including the National Disaster Response Force (NDRF), were only able to reach the site several hours after the incident. Soon after the accident, seven 108 ambulances from the Idukki District were deployed to the location for rescue operations, and additional standby ambulances were kept ready for immediate action if needed.



Chooralmala Landslide

In response to the request from the Honorable Health Minister, 4x4 rescue vehicles were deployed to the landslide-affected area in Wayanad to support search and rescue operations.



Discussion

The five-year analysis of the KANIV-108 ambulance service (2020–21 to 2024–25) reveals a sustained transformation in operational dynamics, workload composition, and district-level performance. These findings are important for programme managers, health system planners and policymakers because they illuminate both the evolving demand for pre-hospital and inter-facility services and the operational levers that underpin efficiency and equity of access.

Changing Patterns in Call Volume and Trip Composition

Across 2020–21 to 2024–25, the overall call and trip trends show distinct phases: a COVID-driven peak, a correction phase, and a stabilization period. The decline in emergency calls and the rise in inter-facility transfers (IFTs) do not represent a "shift in achievement" but reflect changing health-system demands. Hospitals resumed regular services post-pandemic, increasing the number of patient transfers between facilities through appropriate referrals. This explains why IFTs make up a larger share of total trips in recent years. Analytically, this suggests that the ambulance service responds to changing patterns of health-seeking behavior and hospital functioning rather than experiencing internal operational shifts.

Differences Across Districts

District-level trends show consistent variation, highlighting that geography, population density, and hospital distribution strongly shape service demand.

- **High-trip districts** such as Thiruvananthapuram and Ernakulam have major hospitals and higher population density, naturally leading to more trips. Their operational workload is heavier, and they require more vehicle capacity.
- **Low-trip districts** such as Idukki and Wayanad consistently record lower volumes, but trips are longer because of terrain barriers. This explains their longer response times despite good trip completion rates.

These patterns indicate that each district's performance must be viewed in its own context rather than compared directly to others. A mountainous district cannot be expected to match the response time of an urban coastal district.

Across five years Thiruvananthapuram consistently emerges as the highest-demand district and demonstrates high vehicle productivity (highest trips per 24-hour vehicle). Ernakulam and Thrissur are steady high-volume districts as well. Conversely, districts such as Idukki, Wayanad and Kasaragod show persistently low volumes but high proportions of IFTs. These patterns point to two simultaneous phenomena:

- (a) Urban/regional referral hubs concentrate demand and benefit from economies of scale
- (b) Geographically-challenged districts produce low volume but proportionally longer and logistically complex trips.

This heterogeneity implies that a uniform operational model will be suboptimal.

Policy should differentiate between:

- (i) High-volume urban hubs requiring rapid-response capacity and high fleet utilization
- (ii) low-volume, difficult-terrain districts requiring tailored staffing (e.g., advanced life support trained teams for time-to-hospital delays), vehicle

Vehicle Productivity and Service Efficiency

A clear, simple analytical conclusion is that **24-hour ambulances are consistently more productive** than 12-hour ambulances across all years. Higher trip counts and higher kilometres per vehicle indicate that they are better aligned with the state's current pattern of demand, which includes more long-distance transfers.

This suggests that continuous-coverage ambulances deliver superior utilisation and responsiveness in the present operational mix—particularly where IFTs and longer-distance transfers prevail. Strategically, this supports preferential deployment of 24-hour ambulances in high-demand corridors and referral networks, while re-evaluating the role and placement of 12-hour assets in light of their lower utilisation.

Response Time and Achievement Percentage

The relationship between response time and percentage of trips achieved shows a clear but moderate pattern: districts with quicker response times tend to complete a higher proportion of their trips. However, in terrain-difficult districts (Idukki and Wayanad),

high achievement rates persist despite long travel times. This confirms that their delays are linked to road and geographic conditions rather than operational inefficiency.

A key analytical insight is that **improvement over time is consistent**: almost all districts **have reduced their response times** and increased their achievement rates from 2021 to 2025. This suggests system strengthening—better routing, better coordination, and improved operational readiness.

Medical Conditions and Emergency Burden

As COVID declined, the emergency burden shifted toward typical acute conditions—cardiac issues, breathing difficulty, trauma, abdominal pain, and diabetic emergencies. Their stable ranking in the top categories indicates persistent health-system needs. A notable analytical concern is the rising number of poisoning and attempted suicide cases.

Overall System Learning

The five-year period shows that the ambulance service has become more consistent, more predictable, and better aligned with the changing needs of the health system. Key strengths emerging from the analysis include:

- Stable high achievement rates
- Decreasing cancellation rates
- Increased operational maturity after the pandemic
- Clearer district-level patterns useful for planning

Way Forward

As KANIV-108 evolves in response to changing health-system needs, the priority ahead is to *further strengthen, refine, and stabilise* the existing service delivery framework. Building district-level insights, the model can be enhanced by optimizing the fleet composition and reinforcing workforce capacities to efficiently meet both IFT-dominant requirements and rapid emergency response needs in high-demand areas. Strengthening coordination mechanisms—both within districts and across referral pathways—will help ensure smoother inter-facility transfers and timelier emergency mobilization. Developing a set of contextual and district-sensitive performance metrics, including composite indicators that integrate achievement rates, response-time patterns, and clinical urgency, will support more accurate monitoring of equity, quality, and operational responsiveness. Continued emphasis on data-driven decision-making, geographic prioritization, and adaptive planning will ensure that KANIV-108 remains resilient, responsive, and aligned with the broader goals of a high-performing emergency care system.

Appendix

Raw data tables for each year for reference

Kaniv 108 Ambulance Fleet and Trip Data by District (2020-21 to 2024-25)

2020-21

Districts	Total no. of vehicles	No. of 24-hr vehicles	Trips in 24-hr vehicles	No. of 12-hr vehicles	Trips in 12-hr vehicles
ALAPPUZHA	18	9	9120	9	7394
ERNAKULAM	32	16	6701	16	6374
IDUKKI	15	7	3440	8	3608
KANNUR	21	10	10640	11	8643
KASARAGOD	14	7	5283	7	6593
KOLLAM	21	9	6458	12	7898
KOTTAYAM	17	8	8483	9	8912
KOZHIKODE	31	14	10010	17	9428
MALAPPURAM	32	14	11504	18	13432
PALAKKAD	28	13	15147	15	15883
PATHANAMTHITTA	15	7	6882	8	4995
THIRUVANANTHAPURAM	29	19	17441	10	8711
THRISSUR	32	13	9377	19	11414
WAYANAD	11	5	3822	6	4359
Grand Total	316	151	124308	165	117644

2021-22

Districts	Total no. of vehicles	No. of 24-hr vehicles	Trips in 24-hr vehicles	No. of 12-hr vehicles	Trips in 12-hr vehicles
ALAPPUZHA	18	9	10737	9	5586
ERNAKULAM	32	16	11512	16	8645
IDUKKI	15	7	3170	8	3340
KANNUR	21	10	6224	11	4620
KASARAGOD	14	7	4180	7	3400
KOLLAM	21	9	7963	12	8924
KOTTAYAM	17	8	6177	9	6060
KOZHIKODE	31	14	7446	17	8491
MALAPPURAM	32	14	8207	18	8334
PALAKKAD	28	13	9298	15	8884
PATHANAMTHITTA	15	7	5894	8	3795
THIRUVANANTHAPURAM	29	19	18113	10	8745
THRISSUR	32	13	6819	19	7580
WAYANAD	11	5	4197	6	4996
Grand Total	316	151	109937	165	91400

2022-23

Districts	Total no. of vehicles	No. of 24-hr vehicles	Trips in 24-hr vehicles	No. of 12-hr vehicles	Trips in 12-hr vehicles
ALAPPUZHA	18	9	13064	9	5082
ERNAKULAM	32	16	15515	16	4866
IDUKKI	15	7	3422	8	1831
KANNUR	21	10	7712	11	3454
KASARAGOD	14	7	5280	7	2128
KOLLAM	21	9	9678	12	5056
KOTTAYAM	17	8	7893	9	3889
KOZHIKODE	31	14	8743	17	3751
MALAPPURAM	32	14	7826	18	3322
PALAKKAD	28	13	9061	15	3712
PATHANAMTHITTA	18	10	6508	8	3344
THIRUVANANTHAPURAM	29	19	26082	10	6437
THRISSUR	32	13	10361	19	5309
WAYANAD	11	5	3431	6	2086
Grand Total	319	154	134576	165	54267

2023-24

Districts	Total no. of vehicles	No. of 24-hr vehicles	Trips in 24-hr vehicles	No. of 12-hr vehicles	Trips in 12-hr vehicles
ALAPPUZHA	18	9	12595	9	4841
ERNAKULAM	32	16	16807	16	5404
IDUKKI	15	7	3681	8	1993
KANNUR	21	10	8637	11	3542
KASARAGOD	14	7	5238	7	2062
KOLLAM	21	9	9639	12	5241
KOTTAYAM	17	8	7406	9	3427
KOZHIKODE	31	14	11015	17	4082
MALAPPURAM	32	14	8541	18	3282
PALAKKAD	28	13	9956	15	4365
PATHANAMTHITTA	18	10	6931	8	3845
THIRUVANANTHAPURAM	29	19	26700	10	6113
THRISSUR	32	13	11790	19	6092
WAYANAD	11	5	3895	6	2196
Grand Total	319	154	142831	165	56485

2024-25

Districts	Total no. of vehicles	No. of 24-hr vehicles	Trips in 24-hr vehicles	No. of 12-hr vehicles	Trips in 12-hr vehicles
ALAPPUZHA	18	9	11454	9	4737
ERNAKULAM	32	16	16192	16	5419
IDUKKI	15	7	3459	8	2094
KANNUR	21	10	7952	11	3244
KASARAGOD	14	7	4841	7	2051
KOLLAM	21	9	8397	12	5070
KOTTAYAM	17	8	6391	9	3517
KOZHIKODE	31	14	12343	17	4181
MALAPPURAM	32	14	8194	18	3352
PALAKKAD	29	14	8950	15	4265
PATHANAMTHITTA	18	10	6866	8	3627
THIRUVANANTHAPURAM	29	19	27262	10	6165
THRISSUR	32	13	11754	19	6044
WAYANAD	11	5	3561	6	2265
Grand Total	320	155	137616	165	56031

District wise trips and distance travelled by ambulances (2020-21 to 2024-25)

2020-21

Districts	No. of Vehicles	No. of Trips	COVID -19	Other Emergencies	Canceled Trips	Distance Travelled
ALAPPUZHA	18	16514	6804	9710	1008	8,30,220
ERNAKULAM	32	13075	12084	991	344	8,44,567
IDUKKI	15	7048	5669	1379	252	6,76,880
KANNUR	21	19283	18652	631	459	10,41,276
KASARAGOD	14	11876	10772	1104	110	5,67,989
KOLLAM	21	14356	12253	2103	309	9,64,366
KOTTAYAM	17	17395	16398	997	105	5,98,547
KOZHIKODE	31	19438	18291	1147	688	11,31,982
MALAPPURAM	32	24936	23944	992	556	14,97,834
PALAKKAD	28	31030	29376	1654	167	13,62,102
PATHANAMTHITTA	15	11877	7312	4565	344	6,84,113
THIRUVANANTHAPURAM	29	26152	20030	6122	1874	11,61,716
THRISSUR	32	20791	19483	1308	196	13,50,733
WAYANAD	11	8181	7157	1024	144	5,16,573
Total	316	241952	208225	33727	6556	1,32,28,898

2021-22

Districts	No. of Vehicles	No. of Trips	COVID -19	Other Emergencies	Canceled Trips	Distance Travelled
ALAPPUZHA	18	16323	4626	11697	750	8,49,701
ERNAKULAM	32	20157	14975	5182	454	11,34,666
IDUKKI	15	6510	3770	2740	164	7,51,125
KANNUR	21	10844	7263	3581	169	6,45,488
KASARAGOD	14	7580	5146	2434	76	4,81,707
KOLLAM	21	16887	13350	3537	390	10,26,478
KOTTAYAM	17	12237	8841	3396	125	5,25,368
KOZHIKODE	31	15937	13513	2424	177	6,97,503
MALAPPURAM	32	16541	13285	3256	236	8,53,608
PALAKKAD	28	18182	15021	3161	197	11,42,581
PATHANAMTHITTA	15	9689	4073	5616	270	6,90,503
THIRUVANANTHAPURAM	29	26858	11225	15633	2043	10,49,156
THRISSUR	32	14399	9630	4769	377	8,01,179
WAYANAD	11	9193	7927	1266	91	5,57,380
Total	316	201337	132645	68692	5519	1,12,06,443

2022-23

Districts	No. of Vehicles	No. of Trips	COVI D-19	Other Emergencies	Cancell ed Trips	Distance Travelled
ALAPPUZHA	18	18146	26	18120	578	9,26,350
ERNAKULAM	32	20381	306	20075	467	14,20,829
IDUKKI	15	5253	64	5189	87	8,34,695
KANNUR	21	11166	9	11157	177	8,12,187
KASARAGOD	14	7408	113	7295	98	5,16,220
KOLLAM	21	14734	163	14571	517	13,05,468
KOTTAYAM	17	11782	15	11767	237	6,32,301
KOZHIKODE	31	12494	237	12257	291	6,83,739
MALAPPURAM	32	11148	11	11137	176	8,23,430
PALAKKAD	28	12773	33	12740	307	10,27,916
PATHANAMTHITTA	18	9852	55	9797	229	9,07,914
THIRUVANANTHAPURAM	29	32519	180	32339	2018	12,52,389
THRISSUR	32	15670	35	15635	443	8,21,816
WAYANAD	11	5517	26	5491	56	5,05,970
Total	319	188843	1273	187570	5681	1,24,71,224

2023-24

Districts	No. of Vehicles	No. of Trips	COVI D-19	Other Emergencies	Cancell ed Trips	Distance Travelled
ALAPPUZHA	18	17436	1	17435	664	8,63,508
ERNAKULAM	32	22211	61	22150	709	14,89,931
IDUKKI	15	5674	14	5660	101	8,49,710
KANNUR	21	12179	5	12174	221	9,03,207
KASARAGOD	14	7300	14	7286	79	5,16,600
KOLLAM	21	14880	29	14851	579	12,83,153
KOTTAYAM	17	10833	0	10833	264	5,66,937
KOZHIKODE	31	15097	18	15079	402	8,46,136
MALAPPURAM	32	11823	7	11816	213	8,33,650
PALAKKAD	28	14321	1	14320	409	10,58,900
PATHANAMTHITTA	18	10776	17	10759	235	9,73,831
THIRUVANANTHAPURAM	29	32813	29	32784	2169	11,97,984
THRISSUR	32	17882	10	17872	595	8,68,735
WAYANAD	11	6091	24	6067	104	5,14,807
Total	319	199316	230	199086	6744	1,27,67,089

2024-25

Districts	No. of Vehicles	No. of Trips	COVI D-19	Other Emergencies	Cancell ed Trips	Distance Travelled
ALAPPUZHA	18	16191	0	16191	525	8,16,555
ERNAKULAM	32	21611	0	21611	525	13,62,428
IDUKKI	15	5553	0	5553	87	7,96,273
KANNUR	21	11196	0	11196	200	8,57,865
KASARAGOD	14	6892	0	6892	54	4,70,967
KOLLAM	21	13467	0	13467	443	11,35,301
KOTTAYAM	17	9908	0	9908	235	4,79,729
KOZHIKODE	31	16524	1	16523	410	9,11,481
MALAPPURAM	32	11546	0	11546	155	8,03,840
PALAKKAD	29	13215	0	13215	314	9,65,639
PATHANAMTHITTA	18	10493	0	10493	190	9,41,487
THIRUVANANTHAPU RAM	29	33427	0	33427	1914	12,08,921
THRISSUR	32	17798	0	17798	499	8,44,433
WAYANAD	11	5826	0	5826	87	4,57,258
Total	320	193647	1	193646	5638	1,20,52,177

Peak and Off-Peak Performance of Ambulance Trips (2020-21 to 2024-25)

2020-21

Districts	Peak (Attended)	Off-Peak (Attended)	Peak (Cancelled)	Off-Peak (Cancelled)	Total Trips
	(08:00AM to 07:59PM)	(08:00PM to 07:59AM)	(08:00AM to 07:59PM)	(08:00PM to 07:59AM)	
ALAPPUZHA	10159	5347	645	363	16514
ERNAKULAM	8917	3814	257	87	13075
IDUKKI	6176	620	198	54	7048
KANNUR	16092	2732	314	145	19283
KASARAGOD	10511	1255	86	24	11876
KOLLAM	11604	2443	238	71	14356
KOTTAYAM	15664	1626	90	15	17395
KOZHIKODE	15514	3236	468	220	19438
MALAPPURAM	18223	6157	432	124	24936
PALAKKAD	27253	3610	129	38	31030
PATHANAMTHITTA	9096	2437	258	86	11877
THIRUVANANTHAPU RAM	18165	6113	1347	527	26152
THRISSUR	17766	2829	168	28	20791
WAYANAD	7124	913	119	25	8181
Total	192264	43132	4749	1807	24195 2

2021-22

Districts	Peak (Attended)	Off-Peak (Attended)	Peak (Cancelled)	Off-Peak (Cancelled)	Total Trips
	(08:00AM to 07:59PM)	(08:00PM to 07:59AM)	(08:00AM to 07:59PM)	(08:00PM to 07:59AM)	
ALAPPUZHA	10526	4785	612	400	16323
ERNAKULAM	13012	6515	385	245	20157
IDUKKI	5023	1266	155	66	6510
KANNUR	8027	2585	153	79	10844
KASARAGOD	5821	1644	75	40	7580
KOLLAM	12297	4064	326	200	16887
KOTTAYAM	9053	3009	106	69	12237
KOZHIKODE	12065	3636	156	80	15937
MALAPPURAM	12211	4033	200	97	16541
PALAKKAD	13379	4546	163	94	18182
PATHANAMTHITTA	6916	2398	267	108	9689
THIRUVANANTHAPURAM	16516	7473	1832	1037	26858
THRISSUR	10324	3613	307	155	14399
WAYANAD	7459	1606	92	36	9193
Total	142629	51173	4829	2706	201337

2022-23

Districts	Peak (Attended)	Off-Peak (Attended)	Peak (Cancelled)	Off-Peak (Cancelled)	Total Trips
	(08:00AM to 07:59PM)	(08:00PM to 07:59AM)	(08:00AM to 07:59PM)	(08:00PM to 07:59AM)	
ALAPPUZHA	11803	5776	331	236	18146
ERNAKULAM	12874	7058	258	191	20381
IDUKKI	3993	1187	52	21	5253
KANNUR	7969	3032	110	55	11166
KASARAGOD	5409	1909	59	31	7408
KOLLAM	9452	4791	291	200	14734
KOTTAYAM	8037	3512	143	90	11782
KOZHIKODE	8496	3717	176	105	12494
MALAPPURAM	7522	3456	104	66	11148
PALAKKAD	8628	3853	174	118	12773
PATHANAMTHITTA	6599	3034	145	74	9852
THIRUVANANTHAPURAM	19982	10534	1311	692	32519
THRISSUR	10689	4544	254	183	15670
WAYANAD	4104	1373	28	12	5517
Total	125557	57776	3436	2074	188843

2023-24

Districts	Peak (Attended)	Off-Peak (Attended)	Peak (Cancelled)	Off-Peak (Cancelled)	Total Trips
	(08:00AM to 07:59PM)	(08:00PM to 07:59AM)	(08:00AM to 07:59PM)	(08:00PM to 07:59AM)	
ALAPPUZHA	11315	5457	408	256	17436
ERNAKULAM	14172	7329	418	292	22211
IDUKKI	4343	1229	71	31	5674
KANNUR	8677	3281	161	60	12179
KASARAGOD	5305	1916	50	29	7300
KOLLAM	10054	4244	376	206	14880
KOTTAYAM	7218	3350	167	98	10833
KOZHIKODE	10410	4285	238	164	15097
MALAPPURAM	8063	3545	129	86	11823
PALAKKAD	9736	4174	257	154	14321
PATHANAMTHITTA	7391	3150	146	89	10776
THIRUVANANTHAPURAM	20132	10511	1382	788	32813
THRISSUR	12162	5124	342	254	17882
WAYANAD	4522	1464	63	42	6091
Total	133500	59059	4208	2549	199316

2024-25

Districts	Peak (Attended)	Off-Peak (Attended)	Peak (Cancelled)	Off-Peak (Cancelled)	Total Trips
	(08:00AM to 07:59PM)	(08:00PM to 07:59AM)	(08:00AM to 07:59PM)	(08:00PM to 07:59AM)	
ALAPPUZHA	10714	4952	316	209	16191
ERNAKULAM	14024	7062	308	217	21611
IDUKKI	4248	1218	67	20	5553
KANNUR	7896	3100	128	72	11196
KASARAGOD	5089	1749	36	18	6892
KOLLAM	9437	3587	284	159	13467
KOTTAYAM	6802	2871	153	82	9908
KOZHIKODE	11246	4868	245	165	16524
MALAPPURAM	8106	3285	94	61	11546
PALAKKAD	9067	3834	181	133	13215
PATHANAMTHITTA	7230	3073	122	68	10493
THIRUVANANTHAPURAM	20673	10840	1197	717	33427
THRISSUR	12153	5146	294	205	17798
WAYANAD	4455	1284	68	19	5826
Total	131140	56869	3493	2145	193647

Classification of Ambulance Service Requests (2020-21 to 2024-25)

2020-21

District	Emergency	Inter-facility transfer	Govt. Special Request	Grand Total
ALAPPUZHA	10046	6468	0	16514
ERNAKULAM	12513	562	0	13075
IDUKKI	5978	1070	0	7048
KANNUR	18971	312	0	19283
KASARAGOD	11118	758	0	11876
KOLLAM	13046	1310	0	14356
KOTTAYAM	16755	640	0	17395
KOZHIKODE	18932	506	0	19438
MALAPPURAM	24419	517	0	24936
PALAKKAD	29936	1094	0	31030
PATHANAMTHITTA	8411	3466	0	11877
THIRUVANANTHAPURAM	24414	1738	0	26152
THRISSUR	20201	590	0	20791
WAYANAD	7419	762	0	8181
Grand Total	222159	19793	0	241952

2021-22

District	Emergency	Inter-facility transfer	Govt. Special Request	Grand Total
ALAPPUZHA	8311	7970	42	16323
ERNAKULAM	16204	3871	82	20157
IDUKKI	4071	2391	48	6510
KANNUR	7880	2460	504	10844
KASARAGOD	5552	2008	20	7580
KOLLAM	14253	2622	12	16887
KOTTAYAM	9392	2830	15	12237
KOZHIKODE	14218	1618	101	15937
MALAPPURAM	13816	2594	131	16541
PALAKKAD	15627	2517	38	18182
PATHANAMTHITTA	5302	4356	31	9689
THIRUVANANTHAPURAM	21483	4953	422	26858
THRISSUR	11163	3163	73	14399
WAYANAD	8166	961	66	9193
Grand Total	155438	44314	1585	201337

2022-23

District	Emergency	Inter-facility transfer	Govt. Special Request	Grand Total
ALAPPUZHA	4853	13281	12	18146
ERNAKULAM	4294	16079	8	20381
IDUKKI	569	4683	1	5253
KANNUR	2212	8946	8	11166
KASARAGOD	1288	6114	6	7408
KOLLAM	2821	11880	33	14734
KOTTAYAM	2151	9611	20	11782
KOZHIKODE	3330	8958	206	12494
MALAPPURAM	1342	9799	7	11148
PALAKKAD	2134	10616	23	12773
PATHANAMTHITTA	2037	7744	71	9852
THIRUVANANTHAPURAM	18774	13608	137	32519
THRISSUR	3685	11827	158	15670
WAYANAD	997	4516	4	5517
Grand Total	50487	137662	694	188843

2023-24

District	Emergency	Inter-facility transfer	Govt. Special Request	Grand Total
ALAPPUZHA	5243	12152	41	17436
ERNAKULAM	5171	17028	12	22211
IDUKKI	636	5032	6	5674
KANNUR	2546	9630	3	12179
KASARAGOD	1299	6001	0	7300
KOLLAM	2905	11921	54	14880
KOTTAYAM	2614	8080	139	10833
KOZHIKODE	4101	10918	78	15097
MALAPPURAM	1738	9991	94	11823
PALAKKAD	2959	11303	59	14321
PATHANAMTHITTA	2284	8455	37	10776
THIRUVANANTHAPURAM	18969	13402	442	32813
THRISSUR	4701	13013	168	17882
WAYANAD	1432	4654	5	6091
Grand Total	56598	141580	1138	199316

2024-25

District	Emergency	Inter-facility transfer	Govt. Special Request	Grand Total
ALAPPUZHA	5151	11034	6	16191
ERNAKULAM	5392	16219	0	21611
IDUKKI	704	4849	0	5553
KANNUR	2560	8633	3	11196
KASARAGOD	1335	5557	0	6892
KOLLAM	3082	10378	7	13467
KOTTAYAM	2815	6955	138	9908
KOZHIKODE	4845	11663	16	16524
MALAPPURAM	1910	9519	117	11546
PALAKKAD	3068	10130	17	13215
PATHANAMTHITTA	2325	8078	90	10493
THIRUVANANTHAPURAM	18610	14633	184	33427
THRISSUR	5258	12479	61	17798
WAYANAD	1746	4014	66	5826
Grand Total	58801	134141	705	193647

District-wise Ambulance Utilization and Trip Data (2020-21 to 2024-25)

2020-21

Districts	No of Vehicles	No of Trips	Kilometer Runs	Distance			
				Average kilometer runs per trip	Average kilometer runs per day	Average kilometer runs per ambulance per day	Average kilometer runs per ambulance per month
ALAPPUZHA	18	16514	830220	50.3	2274.6	126.4	3843.6
ERNAKULAM	32	13075	844567	64.6	2313.9	72.3	2199.4
IDUKKI	15	7048	676880	96.0	1854.5	123.6	3760.4
KANNUR	21	19283	1041276	54.0	2852.8	135.8	4132.0
KASARAGOD	14	11876	567989	47.8	1556.1	111.2	3380.9
KOLLAM	21	14356	964366	67.2	2642.1	125.8	3826.8
KOTTAYAM	17	17395	598547	34.4	1639.9	96.5	2934.1

KOZHIKODE	31	19438	1131982	58.2	3101.3	100.0	3043.0
MALAPPURAM	32	24936	1497834	60.1	4103.7	128.2	3900.6
PALAKKAD	28	31030	1362102	43.9	3731.8	133.3	4053.9
PATHANAMTHITTA	15	11877	684113	57.6	1874.3	125.0	3800.6
THIRUVANANTHAPURAM	29	26152	1161716	44.4	3182.8	109.8	3338.3
THRISSUR	32	20791	1350733	65.0	3700.6	115.6	3517.5
WAYANAD	11	8181	516573	63.1	1415.3	128.7	3913.4
Grand Total	316	241952	13228898	54.7	36243.6	114.7	3488.6

2021-22

Districts	No of Vehicles	No of Trips	Kilometer Runs	Distance			
				Average kilometer runs per trip	Average kilometer runs per day	Average kilometer runs per ambulance per day	Average kilometer runs per ambulance per month
ALAPPUZHA	18	16323	849701	52.1	2327.9	129.3	3933.8
ERNAKULAM	32	20157	1134666	56.3	3108.7	97.1	2954.9
IDUKKI	15	6510	751125	115.4	2057.9	137.2	4172.9
KANNUR	21	10844	645488	59.5	1768.5	84.2	2561.5
KASARAGOD	14	7580	481707	63.5	1319.7	94.3	2867.3
KOLLAM	21	16887	1026478	60.8	2812.3	133.9	4073.3
KOTTAYAM	17	12237	525368	42.9	1439.4	84.7	2575.3

KOZHIKODE	31	15937	697503	43.8	1911.0	61.6	1875.0
MALAPPURAM	32	16541	853608	51.6	2338.7	73.1	2222.9
PALAKKAD	28	18182	1142581	62.8	3130.4	111.8	3400.5
PATHANAMTHITTA	15	9689	690503	71.3	1891.8	126.1	3836.1
THIRUVANANTHAPURAM	29	26858	1049156	39.1	2874.4	99.1	3014.8
THRISSUR	32	14399	801179	55.6	2195.0	68.6	2086.4
WAYANAD	11	9193	557380	60.6	1527.1	138.8	4222.6
Grand Total	316	201337	11206443	55.7	30702.6	97.2	2955.3

2022-23

Districts	No of Vehicles	No of Trips	Kilometer Runs	Distance			
				Average kilometer runs per trip	Average kilometer runs per day	Average kilometer runs per ambulance per day	Average kilometer runs per ambulance per month
ALAPPUZHA	18	18146	926350	51.0	2537.9	141.0	4288.7
ERNAKULAM	32	20381	1420829	69.7	3892.7	121.6	3700.1
IDUKKI	15	5253	834695	158.9	2286.8	152.5	4637.2
KANNUR	21	11166	812187	72.7	2225.2	106.0	3223.0
KASARAGOD	14	7408	516220	69.7	1414.3	101.0	3072.7
KOLLAM	21	14734	1305468	88.6	3576.6	170.3	5180.4
KOTTAYAM	17	11782	632301	53.7	1732.3	101.9	3099.5
KOZHIKODE	31	12494	683739	54.7	1873.3	60.4	1838.0

MALAPPURAM	32	11148	823430	73.9	2256.0	70.5	2144.3
PALAKKAD	28	12773	1027916	80.5	2816.2	100.6	3059.3
PATHANAMTHITTA	18	9852	907914	92.2	2487.4	138.2	4203.3
THIRUVANANTHAPURAM	29	32519	1252389	38.5	3431.2	118.3	3598.8
THRISSUR	32	15670	821816	52.4	2251.6	70.4	2140.1
WAYANAD	11	5517	505970	91.7	1386.2	126.0	3833.1
Grand Total	319	188843	12471224	66.0	34167.7	107.1	3257.9

2023-24

Districts	No of Vehicles	No of Trips	Kilometer Runs	Distance			
				Average kilometer runs per trip	Average kilometer runs per day	Average kilometer runs per ambulance per day	Average kilometer runs per ambulance per month
ALAPPUZHA	18	17436	863508	49.5	2359.3	131.1	3997.7
ERNAKULAM	32	22211	1489931	67.1	4070.8	127.2	3880.0
IDUKKI	15	5674	849710	149.8	2321.6	154.8	4720.6
KANNUR	21	12179	903207	74.2	2467.8	117.5	3584.2
KASARAGOD	14	7300	516600	70.8	1411.5	100.8	3075.0
KOLLAM	21	14880	1283153	86.2	3505.9	166.9	5091.9
KOTTAYAM	17	10833	566937	52.3	1549.0	91.1	2779.1
KOZHIKODE	31	15097	846136	56.0	2311.8	74.6	2274.6

MALAPPURAM	32	11823	833650	70.5	2277.7	71.2	2171.0
PALAKKAD	28	14321	1058900	73.9	2893.2	103.3	3151.5
PATHANAMTHITTA	18	10776	973831	90.4	2660.7	147.8	4508.5
THIRUVANANTHAPURAM	29	32813	1197984	36.5	3273.2	112.9	3442.5
THRISSUR	32	17882	868735	48.6	2373.6	74.2	2262.3
WAYANAD	11	6091	514807	84.5	1406.6	127.9	3900.1
Grand Total	319	199316	12767089	64.1	34882.8	109.4	3335.2

2024-25

Districts	No of Vehicles	No of Trips	Kilometer Runs	Distance			
				Average kilometer runs per trip	Average kilometer runs per day	Average kilometer runs per ambulance per day	Average kilometer runs per ambulance per month
ALAPPUZHA	18	16514	830220	50.3	2274.6	126.4	3843.6
ERNAKULAM	32	13075	844567	64.6	2313.9	72.3	2199.4
IDUKKI	15	7048	676880	96.0	1854.5	123.6	3760.4
KANNUR	21	19283	1041276	54.0	2852.8	135.8	4132.0
KASARAGOD	14	11876	567989	47.8	1556.1	111.2	3380.9
KOLLAM	21	14356	964366	67.2	2642.1	125.8	3826.8
KOTTAYAM	17	17395	598547	34.4	1639.9	96.5	2934.1
KOZHIKODE	31	19438	1131982	58.2	3101.3	100.0	3043.0

MALAPPURAM	32	24936	1497834	60.1	4103.7	128.2	3900.6
PALAKKAD	29	31030	1362102	43.9	3731.8	128.7	3914.1
PATHANAMTHITTA	18	11877	684113	57.6	1874.3	104.1	3167.2
THIRUVANANTHAPURAM	29	26152	1161716	44.4	3182.8	109.8	3338.3
THRISSUR	32	20791	1350733	65.0	3700.6	115.6	3517.5
WAYANAD	11	8181	516573	63.1	1415.3	128.7	3913.4
Grand Total	320	241952	13228898	54.7	36243.6	113.3	3445.0





