

# Role of AI in Reducing Honking in Electric Cars in India

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## ABSTRACT

This research paper studies the challenges of excessive honking in India and the possible opportunities of role of Artificial Intelligence in mitigating these issues. This paper explores the causes and impacts of honking to the citizens of the country and analysis the challenges faced by the car manufactures on how honking issue can be eradicated though AI. AI can contribute by analyzing the data which can help to understand the causes and solutions through implementation of the right algorithms for human behavior, road safety enhancement and improving the driving experience. This paper proposes valuable insights to Electric car vehicle manufacturers on how Artificial Intelligence can play a vital role in reducing the car honking in India.

**Keywords :** Noise Pollution, Car Honking, Driving Experience, Insurance Policies, Data Analysis, Electric Car Models.

## I. INTRODUCTION

Noise pollution is a significant concern across the globe and India is on top of the list of countries with this issue. One of the major reasons of noise pollution is the excessive honking and India is no stranger to this challenge. With the increasing population and growing number of vehicles on roads, it becomes imperative to address this issue. Honking has become a major issue in India where drivers are not limited to just alert other drivers or pedestrians, but it has become practice out of their impatience, irritation, and frustration. This rooted habit of excessive honking among Indians is contributing to the excessive levels of noise and exceeding the permissible decibel limits.

Consequently, more and more people are complaining issues of hypertension with high risks of heart problems, headaches, and disrupted sleep problems [1]. Over the time, this habit of honking is rooted in everyone's behavior that actions occur without any conscious thought and decision to honk is coming automatically and naturally. The biggest challenge is how to shift the mindsets of the driver from automatic mode of thinking to consider the situation and genuinely necessity of the horn. Through this paper, the goal is to analyze the role of technology and potential of Artificial Intelligence in reducing this excessive honking in the new emerging section of Electric cars in India.

## II. IMPACTS AND STATISTICS

Looking into global numbers, one in five people live with hearing loss and it is projected to even four people by 2050. In India, approximately 63 million people suffer from hearing loss [2,3]. As shown in figure 1 below, per WHO predicted numbers, around 700 million people will likely suffer from hearing loss globally. [4]

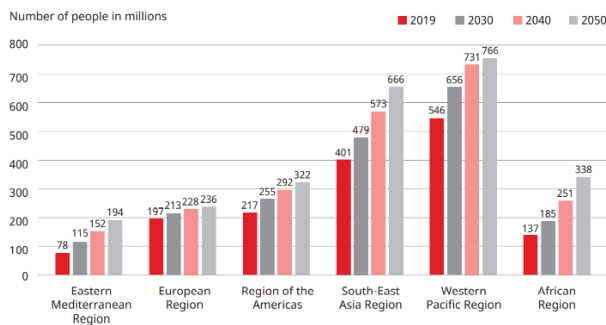


Figure 1 : Projected figures of prevalence of hearing loss (all kinds and grade) in WHO regions (2019-2050), WHO report on World Report on Hearing, 2021 [4]

Also, per WHO recommendations on noise levels, a safe limit is 53 decibels during the day and at night it can be 45 decibels as shown in Figure 2 below.[5] Any individual with an exposure to noise levels exceeding 80 decibels for 6-8 hours a day in a five-day week can lead to hearing loss and other serious health issues like increased stress levels and disturbed sleep patterns.

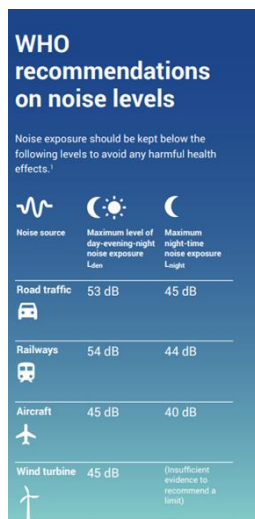


Figure 2: WHO Recommendations on noise level [5]

### 1. How do horns work in Electric cars

Electric cars are the future in terms of technology advancement and reducing the noise pollution specially in urban cities. They are much quieter as compared to other petrol/diesel vehicles with internal combustion engine. The only noise comes from EVs is from their tyres or wind when at high speeds. [6,7] As of these lower noise levels, EVs are required to emit a sound with minimum 56 decibels to alert pedestrians and keep them safe. So, electric vehicles are a good start to reduce the noise pollution levels. As EVs become more and more popular and affordable as technology evolves, there will be fewer petrol and diesel cars which will reduce the noise levels further. EVs are not only better for environment, but they help to create a more peaceful world.

### 2. AI-based Solutions to Reduce Honking

Further to the electric cars and less noise levels generated by them, technology can also play a pivot role in analyzing the human behavior and habit of excessive honking in India. Analyzing honking habits and imposing penalties into driver's insurance plans can have several benefits.

- Data Analytics:** With the help of AI Processes and algorithms, vast amount of data can be analyzed to understand the honking behavior, frequency, and duration. Processing this data, AI algorithms can identify the patterns to determine when honking is unnecessary and excessive.
- Behavior Monitoring:** Again, with AI processing the vast data on duration and frequency of horns, honking habits can be traced in real-time using sensors and onboard systems. These sensors can detect instances when a driver is giving horn unnecessary and provide immediate feedback to encourage them to reduce the excessive honking at that time.

- c. **Penalty Integration:** Penalties can be incorporated in driver's insurance plans based on data captured through AI. AI can work with insurance companies to AI to penalize like increased premiums or other fines to the drivers who exhibit frequent and excessive honking behaviors.
  - d. **Incentivizing Safe Driving:** AI can also be used to recognize and reward the drivers who have demonstrated responsible behavior and who focuses on avoiding excessive honking on roads. AI can help in fostering a culture change by giving incentives for good behaviors on road.
  - e. **Data-Driven Insights:** AI can also help in analyzing the patterns and insights to government authorities to study the target areas of high traffic congested areas. Public campaigns and infrastructure improvements can reduce overall honking levels.
- b. **Sounds of Silence in Bengaluru:** The city of Bengaluru implemented an innovative AI-based solution called "Sounds of Silence." The project involved installing noise sensors across the city to collect data on noise pollution levels, including honking. This data was then analyzed using AI algorithms to identify areas with high noise levels and implement targeted interventions, such as traffic management improvements and public awareness campaigns. The project showcased the potential of AI in understanding honking patterns and developing data-driven strategies to reduce noise pollution.
  - c. **Intelligent Transportation Systems:** AI has been employed in Intelligent Transportation Systems (ITS) to optimize traffic flow and reduce congestion, which can indirectly contribute to reducing honking incidents. For example, the Delhi Integrated Multi-Modal Transit System (DIMTS) has implemented AI-based traffic management systems to analyze real-time traffic data, predict congestion, and suggest alternate routes. By improving traffic flow and reducing congestion, these systems can help minimize situations that lead to honking.

By leveraging AI technology to analyze honking habits and integrate penalties into insurance plans, we can encourage more responsible honking behavior, reduce noise pollution, and ultimately promote safer driving practices on the roads.

### 3. Case Studies and Success Stories

Below are some case studies and success stories of implementing artificial intelligence in reducing honking in India:

- a. **Mumbai's "No Honking" Campaign:** Mumbai Traffic Police initiated a campaign called "Awaaz Do, Pehchan Lo" (Honk, Recognize) to raise awareness about the negative impact of excessive honking. This campaign utilized various AI technologies like AI-based noise monitoring systems, CCTV cameras automatic process of penalties for vehicles violating noise pollution levels. This approach demonstrated the potential for integrating AI in enforcing honking regulations and raising public awareness.

These examples demonstrate how AI can be integrated to address the honking related issues. Not only the honking, but these examples highlight the potential of AI in overall traffic management and seeding the good behaviors in drivers.

### 4. Future Directions and Recommendations for Public Awareness and Education

Some of recommendations which can be considered to promote the awareness and educating people on pros and cons of excessive honking.

- a. **Awareness Campaigns:** Run campaigns through various digital channels like social media Instagram, Facebook, televisions, sign boards and

movie theatres to promote and educate the citizens on the health impacts of excessive honking and negative impacts to the quality of life. Through these campaigns, public can be educated and encourages on this behavior change.

- b. **School Programs:** Schools can conduct various workshops, interactive sessions, and competitions to raise the awareness among students on the consequences and negative impacts of excessive honking. Schools can introduce contents in school curriculum. Students can be encouraged to take pledge to inhibit the good behavior and encourage their family members too.
- c. **Collaboration with Civic Authorities:** Organize initiatives in collaboration with traffic police and civic authorities to increase the awareness on impacts of excessive honking and increasing noise pollution. Collaboration can include organizing workshops and seminars for the behavior change to avoid any unnecessary honking. Even the partnership can be done on digital platforms like social network platforms where influencers can be engaged to emphasize on importance of reduced honking.
- d. **Technology-driven Solutions:** Technology can be leveraged to provide real time information on noise pollution levels in different areas and hence educating drivers on alternative routes with less traffic with quieter roads and less need of honking.
- e. **Rewards and Incentives:** Collaboration with car manufacturers and insurance companies to setup rewards programs and gamify the behavior to encourage reduced honking. Gamification can be integrated to encourage drivers by offering discounts on tolls, insurance premiums and parking fees.

By implementing these recommendations, public awareness and education about excessive honking can be effectively promoted, leading to a positive change in behavior and a reduction in noise pollution levels in India.

### III. CONCLUSION

In conclusion, this research paper outlines the factors which are the reasons for excessive honking behavior also how technology Artificial Intelligence can play a significant role in reducing the honking behavior. By leveraging AI technology and collaboration with car manufacturers, how technology can drive some innovative solutions to address the excessive honking and cultivating the responsible behavior. AI can assist in designing personalized insurance plans that penalize drivers for excessive honking. By analyzing honking data, insurance companies can offer customized plans that incentivize responsible honking behavior. This approach not only promotes safer driving practices but also aligns with the broader goal of reducing noise pollution. In conclusion, the significance of AI in reducing honking in electric cars cannot be overstated. By harnessing the power of AI, we can foster a culture of responsible honking, enhance the driving experience, and contribute to a more harmonious and sustainable urban landscape.

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