MANTECH Publications

Journal of Modern Mechanical Systems and Machining
Volume 5, Issue 2, July-December 2022

An Analytical Examination of the Effects that Automobiles Cause on the Environment

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Abstract

Automobiles are one of the finest inventions, however as technology advances, it also has some negative consequences on the environment. This work is based on a theoretical analysis of the influence of transportation on the environment. It will help us understand the environmental effect of automobiles. This will assist to comprehend the breadth of pollution done by automobiles and their harmful consequences on human and animal. This document discusses how to reduce automobile pollution and protect yourself against pollution. In this work, we attempt to investigate the numerous issues associated with automobile fuel combustion. Environmental contamination is highlighted in this article. This study discusses noise and air pollution.

Keywords: -*Vibrations, particulate matters, GHG's, air quality.*

INTRODUCTION

The automobile business is continuously expanding as consumers desire more and more safe, convenient, quick, and speedy mobility. We cannot picture living without automobiles in today's world. However, it has both positive and negative consequences. In other words, we can think of autos that have a beneficial influence. However, it should not with some bad consequences. The combustion of fuels in autos causes significant pollution to the environment. Air pollution, visual intrusion, vibrations, noise, and other factors contribute to major environmental and human health concerns [1].

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Various articles in newspapers have been written on this critical topic. According to a survey published in Economic Times, diesel automobiles are responsible for the majority of deaths in India. In 2010, automobile emissions caused 361000 premature deaths due to PM2.5 and ozone. In 2015, the number of people increased by 385000[6].

India is taking some positive initiatives to address this. We are focusing on alternative cars such as electric autos. Arvind Kejriwal, the mayor of Delhi, has made some positive initiatives to combat pollution. ODD EVEN formula was one of the good measures achieved.

The Indian government also directed autos to use BS-VI automotive engines. Prakash Javedekar has stated that BS-VI will be available in several major cities throughout the country beginning April 1, 2020. This will aid in lowering automobile emissions [6].

Impact of Traffic on Environment

Fuel burning and automobile implications are examined, including: Noise is a major vehicular pollutant created in three ways. Engine, Body noise. Cyren Horns. Vehicle acceleration/deceleration noise. According to surveys, new automobiles are quieter than old ones [2].

Traffic increases pollution. Noisy heavy trucks. Decibels measure sound. Noisy is above 90dB. 60dB isn't loud [1]. It disrupts the quiet. It causes irritation, headaches, High BP and loudness might cause deafness. It disrupts studies, meetings, etc.

Air pollution is extremely dangerous. Noise is worse. This is bad for people and animals. Automobile pollution is twofold. Pri/sec Pollutants emitted directly by cars are main, and their responses cause secondary. Particulates, nitrogen oxide, carbon dioxide, sulphur dioxide, carbon monoxide, lead compounds, etc. are major air pollutants. Carbon dioxide changes climate. Carbon monoxide in blood is toxic. Fog irritates eyes and reduces visibility.

Visual infiltration [1] is whatever we can see. Such surroundings interrupt the monotony and are harmless. Moving vehicles in the air create nuisance, not damage to structures or people [1]. This paper examines noise and air pollution.

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PERMISSIBLE NOISE LEVEL IN INDIA

Table 1:-Recommended values of noise in different areas [7]

AREA	RECOMMENDED NOISE IN DAY	RECOMMENDED NOISE IN NIGHT	MEASURING UNIT
Residential Area	55	45	dB
Commercial Area	65	55	dB
Industrial Area	75	70	dB
Silent Area	50	40	DB

Central Pollution Control Board has made some recommendations in India about the permissible limit which are as:

Effects of Noise

We considered the effects of noise in two categories1) Auditory 2) non-Auditory. Auditory effects are like deafness. Non auditory effects like annoyance, physical disorder, bad illumination etc [1].

Techniques to Reduce Noise

- By operating traffic in good manner.
- By public awareness program.
- Traffic management.
- Proper adopting proper geometry for roads.
- By avoiding congestion.
- Allow a good Tyre vehicle to drive.
- Prohibition of old noisy vehicles.
- By designing vehicles in a good manner.
- By planting on both side of road if proper land is available.
- To eliminate noise in a city, provide some bye passes etc.
- By proper surface design.
- By using good methodology in construction of road.
- By proper maintenance of vehicles.
- By limiting acceleration and deceleration.
- By reducing private transport.
- By using more no of electric vehicles.

Major Air Pollutants and Their Effects

Due to burning of fuels one gases, fumes and smells are released by vehicles. Which proves hazardous. These hazardous gases are as: Particulate Matter (PM) is most serious threat to human as it directly affects thehuman health. This form is considered as a primary form of pollution.

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Table 2:-Major pollutants and their effects

NAME OF POLLUTANT	FORMATION	EFFECT
Hydrocarbon **Nitrogen oxides**	Generally, formation of ozone takes place at ground level. Itis result of reaction withnitrogen. -	It causes coughing, sneezing, irritation, and completely reduces the storage capacity of lungs. Respiratory infections, irritation to breath.
Sulfur dioxide **Carbon monoxide**	This is formed by burning of diesel. It forms very fine particles in the air. This is formed due to burning of fossil fuels. This has is colorless and odorless.	Respiratory diseases like Asthmacauses chronic illness, may block heart and some other organs.
Carbon dioxide	It makes a global change; it is considered as one of the major green house gasses. It isreleased by vehicles as a result of fuel burning.	Increase in temperature globally.
Chemical compounds	These are produced by the burning up of fuel of vehicles and various other activities.	It causes of diseases like cancer.

PM 2.5 is considered as a serious danger. It is generated from vehicles up to 35% in quantity. Pollution is considered as high if it ranges more than 100%, as moderate more than 50%, as low up to 50%. Its secondary form like nitrogen dioxide, Sulphur dioxide, carbon monoxide is major contributor to PM pollution.

Steps To Reduce Vehicular Air Pollution-

These are based on large practical studies of experienced engineers and scientists these steps are as:

- Sulfur reduction program.
- By adopting clean transportation fuel.
- By adopting smart inspection and maintenance program.
- By introducing some standard for fuel.
- By adopting new technology like electric vehicles, solar vehicles, CNG vehicles.
- Gasoline benzene reduction Program.
- PUC for in use vehicles with strict laws.
- By establishment of laboratories for checking of fuels.
- By making some changes in the design of engine and exhaust.

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Quality of Air

Table 3:-Air quality [5]

Air Quality	*PM 10*	*PM 2.5*
Severe	More than 430	More than 250
Very Poor	351-430	121-250
Poor	251-350	91-120
Moderately Polluted	101-250	61-90
Satisfactory	51-100	31-60
Good	0-50	0-30

It simply means the condition of air which is present around us. A Clean andunpolluted air is considered good for health of human, environment, vegetation, and animals too. But from few decades it has gone worse. Government agencies adopt Air quality index to show how polluted air is. In India we use six categories each category has some different limits of different pollutants some of them are as.

Situation in India

As India is a developing is country and traffic is increasing so we need to take care of automobile emission. In major cities is becomes a major problem line in Delhi, Gurugram, Kanpur, Jaipur, Faridabad etc.

CONCLUSION

Pollution is a major problem all around the world. In this work, we attempted to combine various concepts to raise public awareness about pollution caused by fuel combustion and sound. It was discovered that by following the recommendations offered, we can simply reduce pollution. We can minimise pollution, but it is crucial due to a lack of knowledge. Using CNG and electric vehicles reduces air pollution naturally. Noise pollution may be decreased by education and adequate sign installation.

REFERENCES

1. LR, D. K. (2011). Traffic Engineering and Transportation Planning.

2. Sagar, T. V., & Rao, G. N. (2006).Noise pollution levels in Visakhapatnam city (India). Journal of Environmental Science and Engineering, 48(2), 139.

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3. Traffic in Towns (1964)Buchanan report, London, 253-268.

4. Harassment of honking impact on traffic noise in urban traffic environment of Nagpur, IJEHSE, 2015

5. www.pib.nic.in print release.

6. Economics Times News, 2015

7. https://www. cpcb.nic.in

8. https://www.hspcb.nic.in

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