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HYPERLOOP TRANSPORTATION

¹Dipali S. Pattebahadur, ²Bhushan U. Sharma, ³Nitish L. Kamati, ⁴Utkarsh P. Naktode, ⁵Vishal P. Butale, ⁶Rahul A. Bhagat, ⁷Vishal N. Kolekar, ⁸Anurup D. Dongare, ⁹Pranay D. Karmankar

¹Professor, ^{2,3,4,5,6,7,8,9}Students

¹Department of Civil Engineering,

¹Jawaharlal Darda Institute of Engineering and Technology, Yavatmal, Maharashtra, India.

Abstract : This study has been done to investigate the current transportation problems and to present Hyperloop as a solution to this problem. The main objective of this paper is to understand the construction, maintenance and working of Hyperloop. From this study we conclude that modern and fast transport is the need of today's modern generation and Hyperloop presents an excellent solution to the transportation problems.

keywords – Hyperloop, Modern Transport.

I. INTRODUCTION

Transportation plays a major role in daily life of human beings. It has helped to enhance life over the years and the current world would not be able to thrive without the ability to transfer things from one place to another. It plays an essential role in development of country. It enables trade, commerce and communication that establish civilization.

II. NEED OF STUDY

In ancient times, in around 400 BC the most widely used means of transport were bullock carts presently cars, buses, trains and airplanes are the most widely used means of transportation. Even after such humongous innovations in transport the fast pace of the world requires means to supply goods and people at an even higher speed. As a solution bullet trains were introduced way back in 1964. Along with bullet trains. Hyperloop was introduced. It was coined by Space-X and tesla founder, Elon Musk in 2013. Hyperloop transportation provides an excellent solution to the current transport problems and can cope with the fast pace of the world.

III. OBJECTIVE

The main objective of this paper is to do detail study and analyze Hyperloop transportation.

IV. LITERATURE REVIEW

"The next contender in high-speed transport Elon Musk's Hyperloop"

Studied "The next contender in high-speed transport Elon Musk's Hyperloop", they analyze the theoretical evaluation of the current maglev as well as the evacuated tube technology and concluded that the Hyperloop is feasible if properly designed. It has potential to be much more efficient in terms of energy usage of pod traversing down the tube.

"Mohammed Imran, International Journal of Engineering Research, 2016, pp. 250-256"

Studied "Hyperloop Technology. The passenger transport system." This study aims to discuss about the various elements of Hyperloop transportation system. They also discussed about the two several of Hyperloop transportation system in which one is passenger only version and another is passenger plus vehicle version. Author came out with a result that the transportation of passengers can be possibly done in a very less time at cheaper rate. Further improvement in this technology can lead to more reduction in price with greater sustainability.

V. THEORETICAL ASPECT

Hyperloop Transportation

Hyperloop is based on a principle of creating our own sky in the tube. When an object is moving, the two types of hurdles found are, Air drag and Friction. Hyperloop consists of a low-pressure tube with capsules that are transported at both low and high speeds throughout the length of the tube. The capsules are supported on a cushion of air, featuring pressurized air and aerodynamic lift. The capsules are accelerated via magnetic linear accelerator affixed at various stations on the low-pressure tube

with rotors contained in each capsule. Passengers may enter and exit Hyperloop at stations located either at the ends of the tube, or branches along the tube length.

Working Principle

Hyperloop is based on a principle of magnetic levitation. The principle of magnetic levitation is that a vehicle can be suspended and propelled on a guidance track made with magnets. The vehicle on top of the track may be propelled with the help of a linear induction motor.

Hyperloop (Fig. 1 through Fig. 2) is a proposed transportation system for travelling between Los Angeles, California, and San Francisco, California in 35 minutes. The Hyperloop consists of several distinct components, including:

Component Parts of Hyperloop

1. Capsule:

- Sealed capsules carrying 28 passengers each that travel along the interior of the tube depart on average every 2 minutes from Los Angeles or San Francisco (up to every 30 seconds during peak usage hours).
- A larger system has also been sized that allows transport of 3 full size automobiles with passengers to travel in the capsule.
- The capsules are separated within the tube by approximately 23 miles (37 km) on average during operation.
- The capsules are supported via air bearings that operate using a compressed air reservoir and aerodynamic lift.

2. Tube:

- The tube is made of steel. Two tubes will be welded together in a side by side configuration to allow the capsules to travel both directions.
- Pylons are placed every 100 ft (30 m) to support the tube.
- Solar arrays will cover the top of the tubes in order to provide power to the system.

3. Propulsion:

- Linear accelerators are constructed along the length of the tube at various locations to accelerate the capsules.
- Linear rotors are located on the capsules to transfer momentum to the capsules via the linear accelerators.

4. Route:

- There will be a station at Los Angeles and San Francisco. Several stations along the way will be possible with splits in the tube.
- The majority of the route will follow I-5 and the tube will be constructed in the median.

(3.4)



Fig 1. Hyperloop Conceptual Diagram

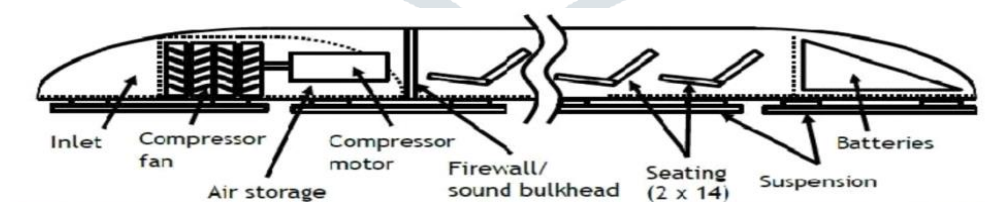


Fig 2. Hyperloop Passenger Capsule

VI. CONCLUSION

In this study, we conclude that Hyperloop transportation provides a solution to present transport problems. The fast and modern pace of the transportation can be achieved by Hyperloop transportation.

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