HYPERLOOP

CONTENTS

INTRODUCTION

- A hyperloop is a proposed high-speed transportation system for both passengers and freight transport.
- Hyperloop is described as a big vacuum sealed tube having very low air pressure.
- Proposed hyperloop design employ three essential components : tube ,pods and terminals.
- A tube is largely sealed low-pressure system ,a coach run inside this low pressure environment often called pod.
- Travelling within these tubes which are continuous beams allow the pod to circumvent the air resistance and drag force.

HISTORY OF HYPERLOOP

- Elon musk, the founder and CEO of tesla, space X ,proposed the concept of hyperloop alpha in a white paper published in 2013 . In it, he described a hyperloop transport system running a route in California from los angles to san Francisco.
- He described it as a potential fifth mode of transport after the existing rail, water, road, water and air travel system.
- The system musk proposed isn't entirely novel. The use of compressed air for transport can be seen as far back in 1904 the concept of Vaccum train proposed by Robert Goddard.
- The paper conceived of a hyperloop system that would propel passengers along the 350miles(560km) route at a speed of 760mph(1200kmph) , allowing the travel time of 35 min. which is faster than any other mode of transport.
- From the very beginning , musk had declared the hyperloop as an open source concept , meaning other companies and scientists were encourage to build on his data.

WHAT IS HYPERLOOP

- Hyperloop is a new form of ground transport currently in development by number of companies . It could see passenger travelling at over 700 miles an hour in floating pod which races along inside giant low pressure tubes either below or above ground.
- It can run at maximum speed of 1220kmph.

WORKING PRINCIPLE

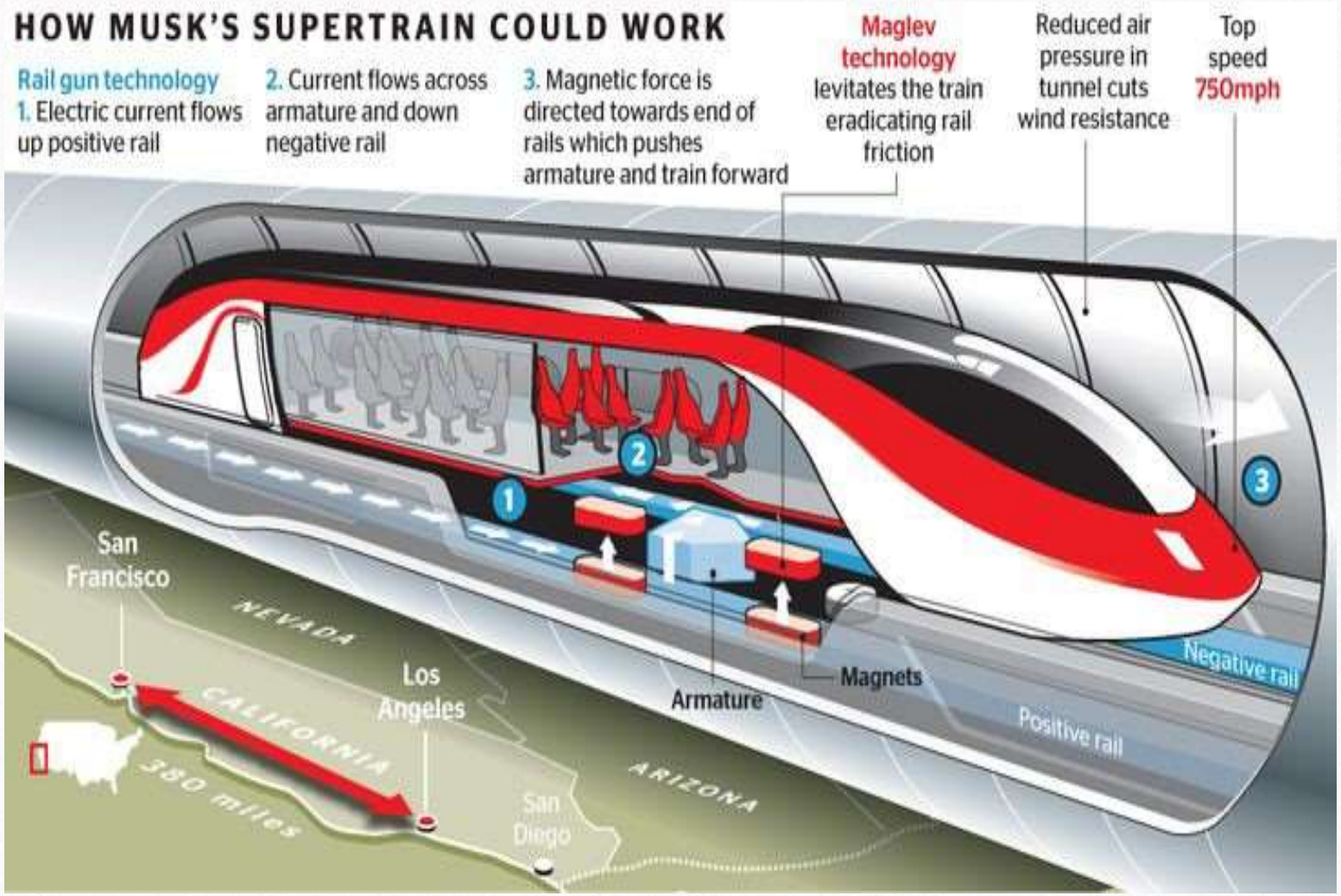
- The working principle of hyperloop technology is based on overcoming the two main barriers to faster transportation – friction and air resistance. A concept was based on idea of tube-pod , a much more advanced and feasible model.
- His design suggests mounting an electric compressor fan on the nose of the pod to maintain pressure. This can also helps in creating a low friction suspension system with air bearing.

- An external linear electric motor is used to power the fan , acceleration is only needed to initially get the pod to high speed and for periodic reboost.
- It levitated and propelled forward using powerful electromagnets this itself considerable reduces losses due to friction , as it is gliding over the track and it is not in contact with the track further the absence of air in the tube will increase the speed and efficiency.

CONSTRUCTION

- During construction there are three distinct components in such a hyperloop transportation.
- 1) CAPSULE/POD: Capsule are sealed vessels used to transport passengers and or cargo most design have suggested that the capacity of each capsule is 25.50 passenger or 15-1800 kg cargo.
- 2)TUBE: A partially evacuated cylindrical tube serves the purpose that track do in conventional railway system. Musk suggested mounting solar panels on the tube to make it fully self powering.

- 3) STATION: Stations are constructed for boarding and unboarding of passengers and cargo.


HOW MUSK'S SUPERTRAIN COULD WORK
Rail gun technology
1. Electric current flows up positive rail
2. Current flows across armature and down negative rail
3. Magnetic force is directed towards end of rails which pushes armature and train forward
Maglev technology levitates the train eradicating rail friction
Reduced air pressure in tunnel cuts wind resistance
Top speed 750mph
1
2
3
San Francisco
NEVADA
Los Angeles
CALIFORNIA
380 miles
San Diego
ARIZONA
Armature
Magnets
Negative rail
Positive rail

- HYPERLOOP IN INDIA

Hyperloop in India is expected to be launched soon!... In the month of February 2018 , chairman of virgin hyperloop one, Richard Branson had announced plans of launching a hyperloop transport system between Pune and Mumbai in the state of Maharashtra. However , those plans have stalled due to covid-19 pandemic.

ADVANTAGES

- High speed is one of the advantages of hyperloop technology.
- Quick and frequent travel.
- It is low cost transportation system on long run.
- Cheaper mode of transportation.
- It is resistant to earthquakes.
- It has very low power consumption.

DISADVANTAGES

- High speed of capsule (almost at speed of sound) may cause dizziness to the passengers travelling due to vibration and jostling.
- It has very high risk to lives when something wrong happens to the system.
- It has limited space in the pod and hence people can not move freely.
- As hyperloop uses steel for track, it expands and change shape when outside temperature is changed. This may destroy the track of hyperloop.
- The installation requires cutting of large number of tree. This leads to environment loss.

CONCLUSION

- As it has number of advantages it will be very helpful for transportation of public as well as goods in very short time and less cost. It is new concept so, there is some future work will required for development of this project.

THANK YOU