**Case Study Of Hyper Loop Train**

**ABSTRACT:-**

Transportation is an industry in constant flux: forced to keep up with the ever-growing human population while providing faster and cheaper methods of travel. In 100 years,
the industry has made colossal improvements, as seen by the replacement of horses with the large-scale implementation of mechanized cars, trains, planes, and boats . Most impressive of all, flight, first achieved in 1903, has reshaped the human notion of travel . In today’s world, traveling at speeds of 560mph, the typical cruising speed for modern airliners, is accepted and for obvious reasons vastly preferred. However, air travel is becoming increasing expensive and inconvenient. This is due in part to higher cost of fuel and increased security at airports, stemming from the inherent nature of airplanes not being restricted to a certain location like a train is to its tracks. For these reasons, a fifth method of transportation is needed to satisfy mankind’s insatiable hunger for high-speed travel at a low cost. Hyper loop can Bethe technology to fill this void. Devised in 2013 by SpaceX CEO Elon Musk, Hyper loop is the idea of placing a passenger carrying pod in a near vacuum and shooting that pod around760mph . For reference, the speed of sound is about767mph.This technology is similar to how modern-day bullet trains work; however, it has the advantage of being incredible cheap, in theory, to build [4]. Currently, two companies are in a race to develop and capitalize on the possibility of this idea. Moreover, hyper loop excites me because of its ability to bring an alternative form of travel to the western coast of America, where airplanes and cars are dominant. Engineers are intrigued by the idea because it could prove to be pertinent in replacing the old transit infrastructure
of America. Lastly, this technology could drastically reduce commute times while being cheap, safe, and convenient for many Americans. The underlying challenge is devising a way to make Hyper loop a reality. it was earlier known the idea of Hyper loop, however the detailed presentation of the project containing technical specifications and an economic justification the day before was for the first time published. So, Elon Musk's new fantastic project represents the transport system consisting of moving on tubes with strongly rarefied air of aluminum capsules. The project was named — Elon Musk’s Hyper loop Elon Musk’s Hyper loop In September, 2012 E. Musk compared his project (which isat a development stage) with land "Concorde": for comparison its speed will exceed the cruiser speed of "Boeing-787"on 200 km/h. Hyperloop is something average between "Concorde “and electromagnetic rail gun, thus it doesn't demand rails. According to the principle work of Hyper loop, by the words of E. Musk, it is similar to the pneumatic train Aeromovel. Aeromovel doesn't allocate harmful blowouts, almost doesn't rustle and is capable to disperse to the speed of 80 km/h that does it an ideal city and suburban transport. We will note that the train Aeromovel is successful operated in Porto Alegre (Brazil),and also in Jakarta (Indonesia).Technically Hyper loop — the electromagnetic gun, "shooting “a shuttle: the running electromagnetic impulse disperses capsule with people to the sub sound speed (about 330 m/s),supports it on the most part of a way then also makes braking(the kinetic energy transformed in electric, stocks up). In turn, the shuttle facilitates dispersal and sliding, soaking up air nasal part(a loss minus on front resistance) and throwing outfit through nozzles of metal "skis" under which the air layer is formed (Figure 3).A new high speed mode of transport is desired between LosAngeles and San Francisco; however, the proposed California High Speed Rail does not reduce current trip times or reduce costs relative to existing modes of transport. This preliminary design study proposes a new mode of high speed transport that reduces both the travel time and travel cost between LosAngeles and San Francisco. Options are also included to increase the transportation system to other major population centers across California. It is also worth noting the energy cost of this system is less than any currently existing mode of transport The only system that comes close to matching the low energy requirements of Hyper loop is the fully electric Tesla Models. The aerodynamic power requirements at 700 mph (1,130 kph)is around only 134 hp (100 kW) with a drag force of only 72 lbf(320 N), or about the same force as the weight of one oversized checked bag at the airport. New technologies which turn

Hyper loop is a new mode of transportation proposed as an alternative to California’s
high speed rail project, with the intended benefits of higher performance at lower overall
costs. It consists of a passenger pod traveling through a tube under a light vacuum and
suspended on air bearings. The pod travels up to transonic speeds resulting in a 35 minute
travel time between the intended route from Los Angeles and San Francisco. Of the two
variants outlined, the smaller system includes a 1.1 meter tall passenger capsule traveling
through a 2.2 meter tube at 700 miles per hour. The passenger pod features water-based
heat exchangers as well as an on-board compression system that reduces the aerodynamic
drag as it moves through the tube. Although the original proposal looks very promising,
it assumes that tube and pod dimensions are independently sizable without fully acknowledging the constraints of the compressor system on the pod geometry. This work focuses
on the aerodynamic and thermodynamic interactions between the two largest systems: the
tube and the pod. Using open-source toolsets, a new sizing method is developed based
on one-dimensional thermodynamic relationships that accounts for the strong interactions
between these sub-systems. These additional considerations require a tube nearly twice
the size originally considered and limit the maximum pod travel speed to about 620 miles
per hour. Although the results indicate that Hyper loop will need to be larger and slightly
slower than originally intended, the estimated travel time only increases by approximately
five minutes, so the overall performance is not dramatically acted. In addition, the proposed on-board heat exchanger is not an ideal solution to achieve reasonable equilibrium
air temperatures within the tube. Removal of this subsystem represents a potential reduction in weight, energy requirements and complexity of the pod. In light of these finding,
the core concept still remains a compelling possibility, although additional engineering and
economic analyses are markedly necessary before a more complete design can be developed.

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