Mark Hoff | Eco Green Group of Silicon Valley | Thursday, March 16, 2017

Hyperloop: The Reality

Eco Green Group Web Site Summary:

Hyperloop is a new high speed form of travel and transport referred to as The Fifth Mode of Transportation. This presentation will provide an overview of the technology. We will watch some videos to get a better idea of what hyperloop is and how it is being developed. We will highlight who will be the first to implement a significant hyperloop longer than 50 miles, and watch their new 2 minute infomercial. Discussion to follow.

This document is meant as a guide to parallel Mark's Eco Green Group presentation. Read the verbage, view the YouTube (and other) videos, browse the indicated web sites. Skip over the portions that do not interest you.

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Six Sections Say Something Substantial (Sort-Of)

I Introduction

II What Is Hyperloop?
A 9 min 24 sec Hyperloop - 1000kmhr Ground Travel!

III How is Hyperloop Development Progressing?
B 2 min 45 sec Full Scale Demo of Elon Musk's Hyperloop
C 11 min 14 sec Hyperloop Pod Test January 29th 2017 (1.2mi Track)
D 2 min 11 sec Dutch and German teams win Spacex Hyperloop pod competition

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E 2 min 31 sec The Hyperloop One System
Examining hyperloop-one.com

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I Introduction

[Wikipedia Link - Hyperloop]

Hyperloop is a proposed mode of passenger and freight transportation that would propel a pod-like vehicle through a near-vacuum tube at more than airline speed.
Musk first mentioned that he was thinking about a concept for a "fifth mode of transport", calling it the Hyperloop, in July 2012 at a PandoDaily event in Santa Monica, California.
This hypothetical high-speed mode of transportation would have the following characteristics:

- immunity to weather
- collision free
- twice the speed of a plane
- low power consumption
- energy storage for 24-hour operations

The name Hyperloop was chosen because it would go in a loop.
Musk envisions the more advanced versions will be able to go at hypersonic speed.
In May 2013, Musk likened the Hyperloop to a
"cross between a Concorde and a railgun and an air hockey table".

Link to initial Pando event:
[Watch YouTube Video - Pando Monthly fireside chat with Elon Musk]
[alternate link on pando.com]
PandoMonthly Presents: A Fireside Chat with Elon Musk
Published on Jul 17, 2012
Time: 63 min 10 sec

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II What Is Hyperloop?

Watch YouTube Video
Hyperloop - 1000km/hr Ground Travel!
Published on Mar 6, 2016
Time 9 min 34 sec
Elon Musk at it again with the Hyperloop.

> But what exactly is it, how did the idea come about?
> (It's actually a little older than you'd think) and what's the latest progress?
> Watch and find out!

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III How is Hyperloop Development Progressing?

Watch YouTube Video
Full Scale Demo of Elon Musk's Hyperloop
Published on May 11, 2016
Time 2 min 45 sec
Hyperloop startup has built the first full-scale test track for the transportation system
in the desert outside Las Vegas.
Today, Hyperloop One (formerly Hyperloop Technologies) accelerated a test vehicle
down a rail track at speeds of up to 300 mph using the hyperloop's propulsion technology.

Watch YouTube Video
Hyperloop Pod Test January 29th 2017 (1.2mi Track)
Published on Feb 1, 2017
Time 11 min 14 sec
Over the last week, 27 teams have been on site at SpaceX in preparation for this weekend's Hyperloop Pod Competition just outside SpaceX headquarters in Hawthorne, CA. The purpose of the competition is to help accelerate the development of a functional Hyperloop prototype and encourage student innovation by challenging university students to design and build the best Hyperloop pod. This competition is the first of its kind anywhere in the world—teams have put their pods through a litany of tests over the last week in hopes of making it into the Hyperloop test track itself. Based on the high-quality submissions and overwhelming enthusiasm surrounding the competition, SpaceX is moving forward with a second installment of the competition: Hyperloop Pod Competition II, which will culminate in a second competition in Summer 2017 at SpaceX's Hyperloop test track. Hyperloop Competition II will be focused on a single criterion: maximum speed. The second competition is open to new student teams interested in competing on the test track, as well as to existing student teams who have already built and tested Pods to further refine their designs.

Watch YouTube Video
Dutch and German teams win Spacex Hyperloop pod competition
Time 2 min 11 sec
Published on Feb 1, 2017
Teams from Germany and the Netherlands win a SpaceX competition
to develop the best and fastest 'pod' to carry passengers
on a future high-speed Hyperloop transportation system. Robert Mezan reports.

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Web Site Link - ArxPax Laboratories

Excerpts include:

Transportation of people or cargo can now be achieved without the restrictions or energy loss due to wheels, transmissions, bearings, bushings, rollers, and friction. These carriers can be translated by pushing them into position to simplify efficient logistics before and after transportation. Hover systems can be used to lift as well as accelerate carriers omni-directionally, which makes it possible to assemble carriages in a small space simply by moving them where they need to be. New ways of moving are possible, such as translating a carrier sideways without affecting its forward velocity.

Carriers can translate on fully open floor formats, special shaped hover tracks, or inside tubes or half-pipes without making surface contact. The hover engines can be placed in any configuration to prevent contact with a surface during terrain aberrations and can be used for braking as well as accelerating while maintaining a hover over a properly prepared surface. With lifting efficiencies achieving 40 watts per kilogram (or better), the energy savings of frictionless motion can be significant. In addition, the simple passive hover surface significantly reduces the cost of infrastructure as compared to older MagLev technologies.

This combination of efficiency and low-cost infrastructure can make hovering mass transportation affordable. Hovering clearance can be significantly higher than older MagLev technologies, which provides a greater margin of safety as well as better magnetic flux shock absorption, culminating in a better ride.

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IV Bridging The Gap: We're not just a train in a tube company anymore.

View VentureBeat News Article and video
Hyperloop One
Published on Nov 8 2016
Time 2 min 31 Sec

[Please view the video and read the article! I quoted much of it during the presentation]
…
"When you bring in the idea that you can travel 700 mph and you can live and work anywhere,
the ideas of cities and states and governments begin to reorient themselves."
Of course, the other selling point will need to be safety and comfort.
The idea of whisking the human body at 700 mph over long distances
still seems hard to fathom, and it has led some to joke that the system is a ticket to "puke city."
Giegel and Pishevar insist that the acceleration and turns will be controlled enough that the experience will seem uneventful.
"It's a smooth experience that will feel like an elevator ride," Giegel said.
"This is grandma-friendly, kid-friendly, and vomit-free."

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Examine this site:
[Web Link to Hyperloop One Corporation]

Excerpts include:
"Be Anywhere, Move Everything, Connect Everyone"
Hyperloop is a new way to move people and things at airline speeds for the price of a bus ticket.
It's on-demand, energy-efficient and safe.
Think: broadband for transportation.
We're not selling transportation, we're selling time.
[If the project pushes through,
Dubai and Abu Dhabi will be connected by a 150-kilometre transport system
that will reduce the travel time between the two emirates to 12 minutes.]

They are hiring (as of Tue Mar 7 2017):
… open Positions in twenty categories: …
"We are looking for qualified engineers and technicians who are passionate about changing the world. If you'd like to join the Hyperloop team, please select the position that best matches your skill set and experience level."
(info omitted as it may be proprietary)

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V The Latest Update

News (as of Fri Mar 3 2017)
View San Jose Mercury News Article and Video
San Jose Mercury News
Transportation
"Menlo Park: Engineers designing Hyperloop train with 765 mph goal"
"Team builds prototype for new form of transportation that can travel from San Francisco to Los Angeles in 30 minutes"

[Read this article – copyright prohibits publishing it here]

Web Link to rloop.org

Watch YouTube Video Set
rLoop participation in SpaceX Hawthorne CA competition
(They won the SpaceX Innovation Award)
alternate link

Source of their magnetic hover engine
Link to ArxPax Web Site
"WE BUILD HOVER ENGINES GIVING RISE TO A BETTER FUTURE"
"The pod employs a magnetic hover engine built by Los Gatos-based firm Arx Pax
that levitates when placed inside the SpaceX tube,
which is almost completely vacuum-sealed to prevent friction.
A series of magnets attached to the motor spin at up to 2,000 revolutions per minute
to achieve levitation when placed in the tube,
which has a copper plate along its entire base.
Wheels attached to the sides of the pod keep it from hitting the sides, allowing for a smooth ride.
Everything except for the hover engine was built by the team from scratch, Lambot said."

News (as of Tue Mar 7 2017 8am)
Link to The National news article - hyperloop related
Hyperloop futuristic transport chief hopes for regulatory approval in 2018

[Read this article – copyright prohibits publishing it here]

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VI Conclusions

Hyperloop is a concept whose target implementation time frame is fast approaching.
It will be the key component in extremely fast mid-distance transportation of people and products.
(Will Express Delivery offer a "same hour - same region" option?)

Along with other innovations such as The PodCar, The SmartPhone, The Cloud, The Self-driving Vehicle, and a cooperative public, there is potential for door-to-door transportation/delivery services barely dreamed of in decades past.

Some would ask whether we really need 765MPH speeds, but we have only to look back to 1943, when the Chairman and CEO of IBM was quoted as saying "I think there is a world market for five computers", or in mid 1981 Seattle where Bill Gates of Microsoft Corporation commenting on the need for computer memory is quoted as saying "640K ought to be enough for anybody".
Today we have billions of computers and we commonly use ten thousand times that 640K of memory in our smartphones.

We will make use of the extra speed hyperloop provides.