

HYPERLOOP

# \$ ECONOMIC IMPACT

## Delays



Total cost of U.S. air transportation delays, including cost to airlines, passengers, and lost demand

## Congestion



Foregone U.S. GDP due to an underperforming freight transportation system (7% of GDP)



Costs of time and fuel on consumers due to U.S. highway congestion

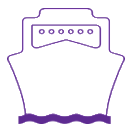
## Bottlenecks



Value of goods in transit – sitting unproductive on planes, trains, and trucks – globally

**“In Chicago, the nation’s biggest rail center, congestion is so bad that it takes a freight train longer to get through the city limits than it does to get to Los Angeles.”**

With demand expected to grow rapidly...



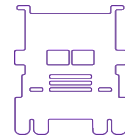
2x

Increase in port volume  
by 2020 from 2012



80%

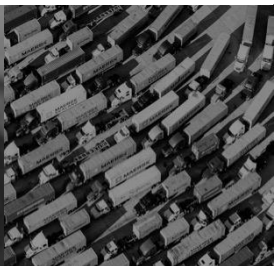
Increase in passenger miles  
in 30 years



88%

Increase in freight tonnage  
by 2035 from 2012

...What is the solution?



Bigger Airports?

More Rail Lines?

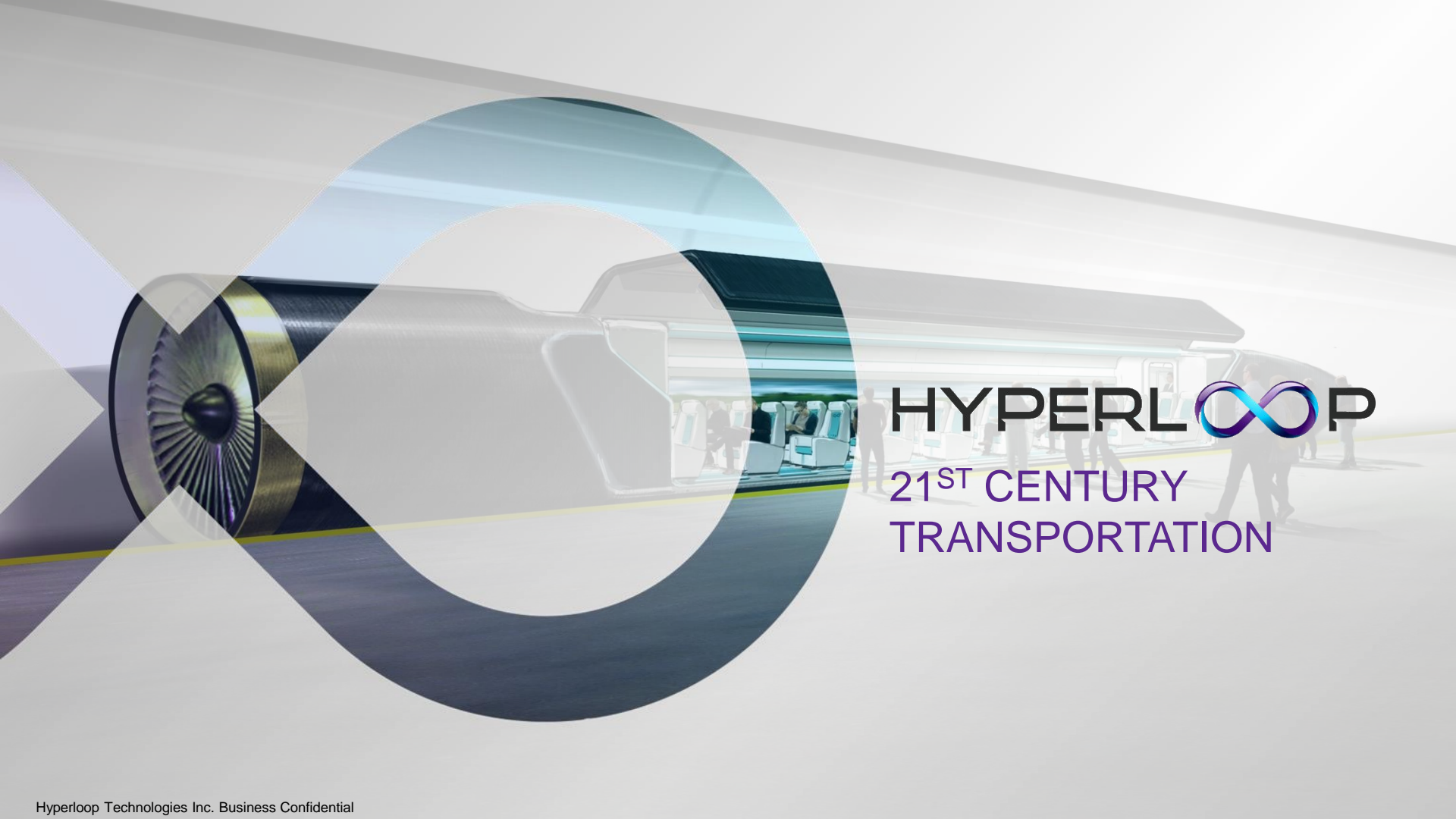
More Cargo Ships?

More Trucks?

Wider Highways?

Bigger Ports?





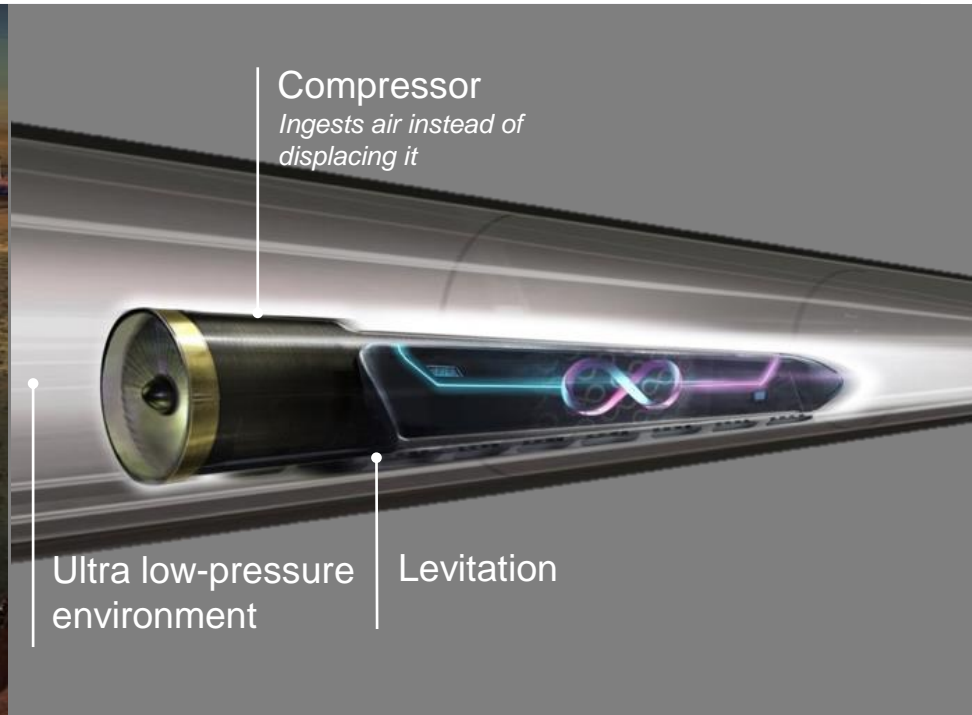
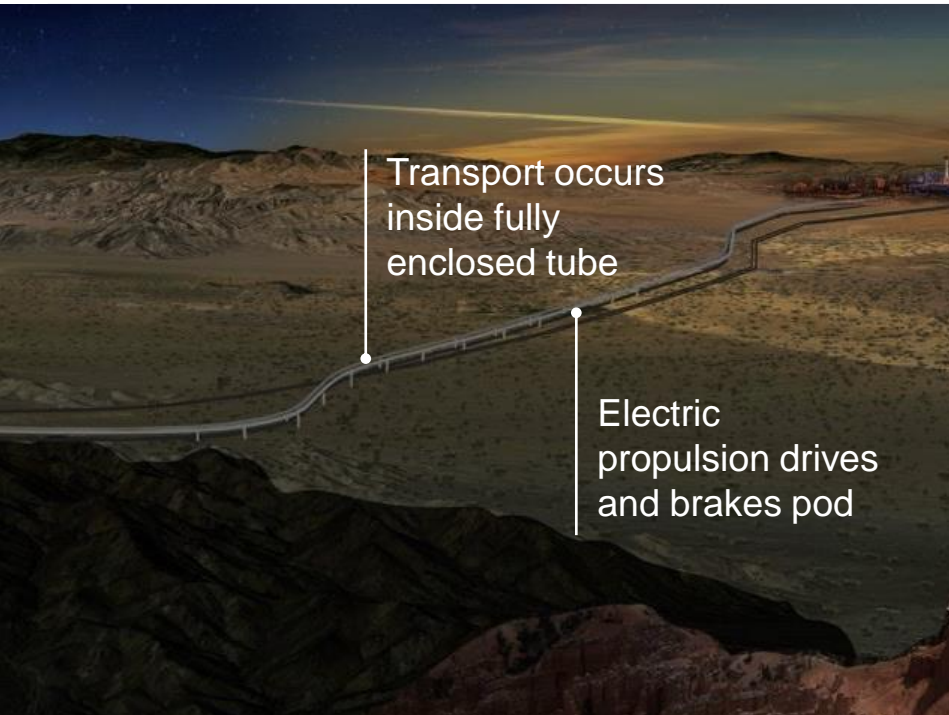
# HYPERLOOP

21<sup>ST</sup> CENTURY  
TRANSPORTATION



# HOW HYPERLOOP WORKS

HYPERLOOP



Weatherproof  
No costly delays

Unrestricted  
ROW

Carbon  
Free

Cost Effective

Driverless

Ultra Safe  
Electric & Air Braking

High Speed  
> 700 mph

Energy Efficient

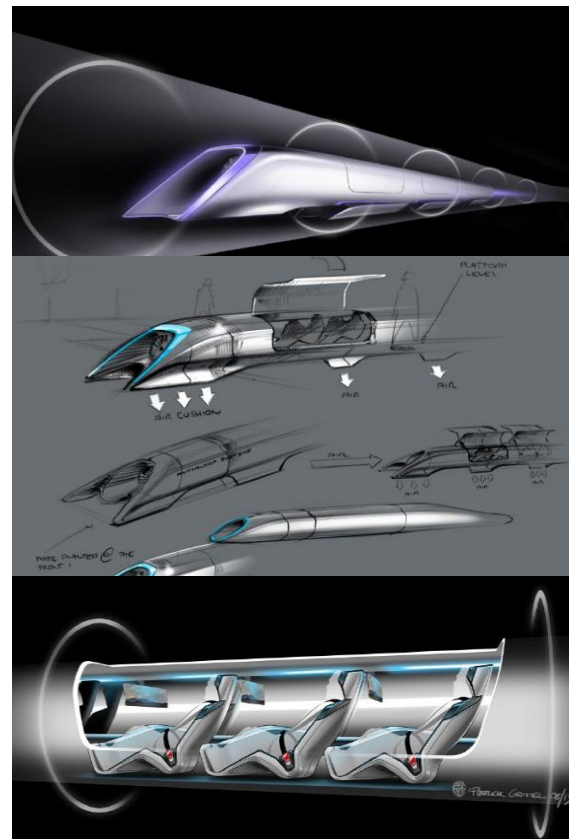
On-demand  
10 Second Interval

# A NEW MODE OF TRANSPORT

HYPERLOOP

“It’s a cross between a Concorde, a rail gun, and an air hockey table.”

ELON MUSK



# MOVES ANYTHING

HYPERLOOP



## CARGO

- Transports 1 or 2 FEU (forty foot equivalent unit)
- Ship a pod every 10 seconds
- Provides cost-effective and fast method of shipping time sensitive goods
- Travels faster than passengers due to allowable g-loading



## PEOPLE

- A tube/pod system designed for cargo can also carry people
- Includes more stringent safety and escape measures
- Pods have ECLS (Environmental Controls & Life Support) System

# GOES ANYWHERE



- Removes need for grading
- Easily crosses natural barriers
  - Bridges are cheaper due to low mass per pod
  - Tunnels are cheaper due to tube's resistance to external pressure
- Does not restrict access or R.O.W.
- Reaches city centers above grade or via tunnel



- Eliminates R.O.W. issues
- Enables offshore ports which can deliver goods to inland ports via minor tunneling
- Reallocates waterfront property








# WELCOME TO THE FUTURE

HYPERLOOP



- ENABLES an on-demand economy
- TRANSFORMS cities
- RESHAPES shipping and logistics industries
- UNLOCKS real estate value
- PROFOUNDLY IMPACTS human behavior and our interaction with the Earth
- REDUCES pollution

**The fastest, cleanest, safest way to connect the world.**

	 BOAT	 TRAIN	 TRUCK	 AIRPLANE	 HYPERLOOP
Cost Effective	●	●	◐		●●●●●
High Speed		◐		●	●●●●●
Ultra Safe	●	◐		◐	●●●●●
Weatherproof					●●●●●
Energy Efficient	●	●			●●●●●
Carbon Free		◐			●●●●●
On-Demand			●		●●●●●
Unrestrictive of ROW	●			●	●●●●●
Driverless					●●●●●



# TEAM & CAMPUS

# WORLD CLASS BOARD OF DIRECTORS

HYPERLOOP



SHERVIN PISHEVAR

FOUNDER

SHERPA  
VENTURES

INVESTOR



DAVID SACKS

COO



COO



FOUNDER



INVESTOR



ROB LLOYD

PRESIDENT



EMILY WHITE

COO

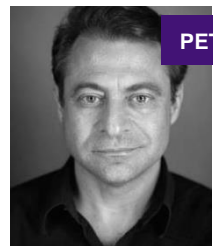


BOD



JIM MESSINA

Political strategist and former deputy chief of staff to **President Obama**. Chief advisor to David Cameron's re-election campaign



PETER DIAMANDIS

FOUNDER



AUTHOR



JOE LONSDALE

FOUNDER

formation | 8



INVESTOR





# OUR TEAM: 110+ FULL TIME EMPLOYEES

HYPERLOOP





# WHY WE CHOSE LA

## TECHNOLOGY HUB

- Many leading engineering companies and abundant talent
- Mega-transportation hub
  - Air, port, rail, road
- Support from government leadership

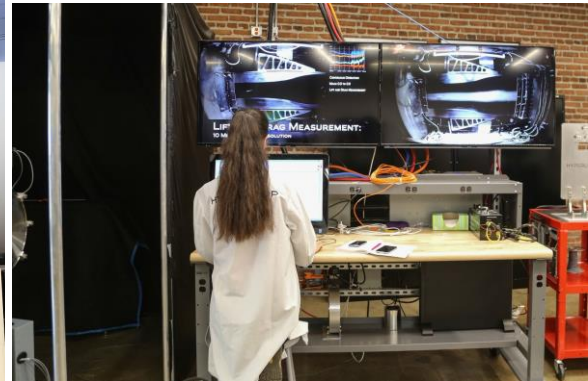
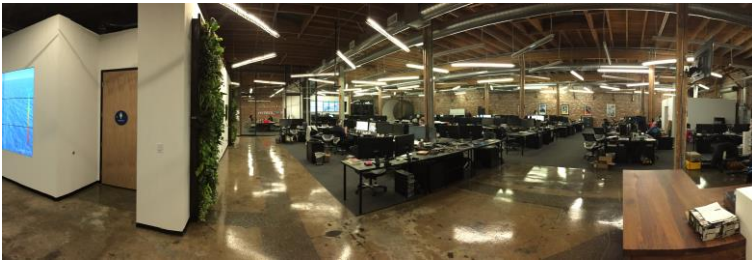
## INNOVATION & CREATIVITY

- Diversity
- Highest rate of entrepreneurialism of major US cities
- More tech & green jobs than any other county in US
- Solar capital of US



# INNOVATION CAMPUS

HYPERLOOP





HYPERLOOP  
IS REAL.



# TUBE DEVELOPMENT

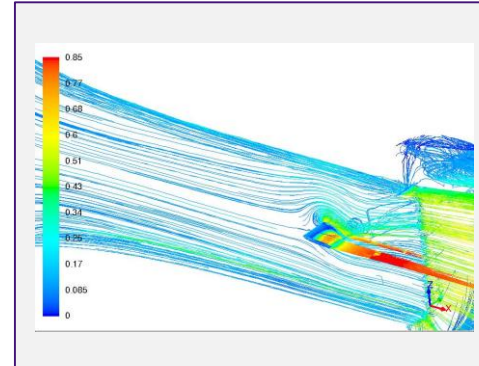
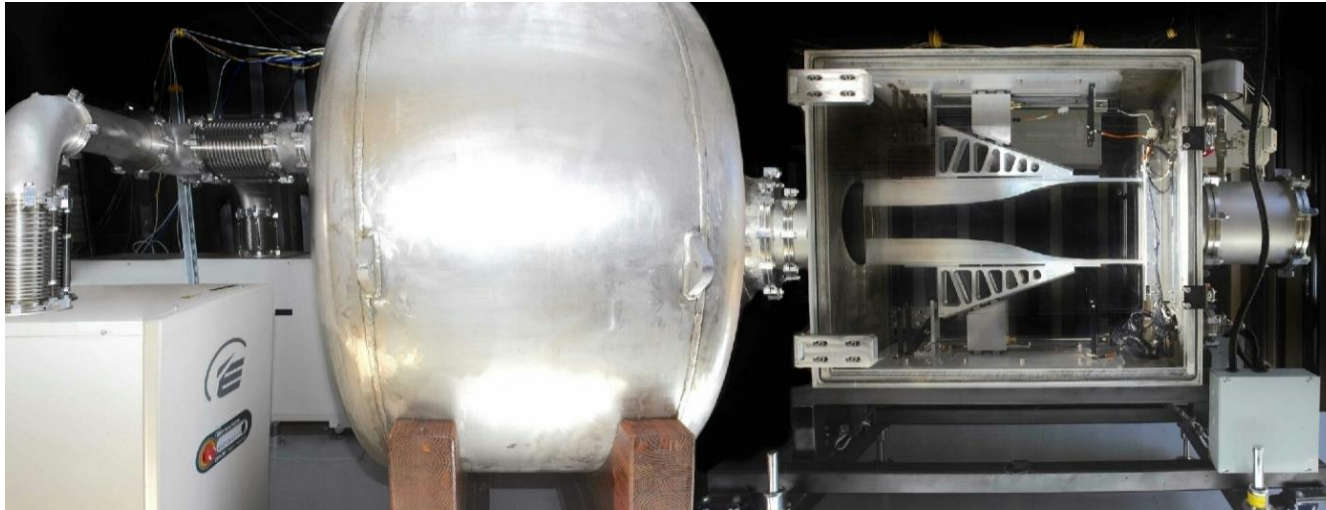
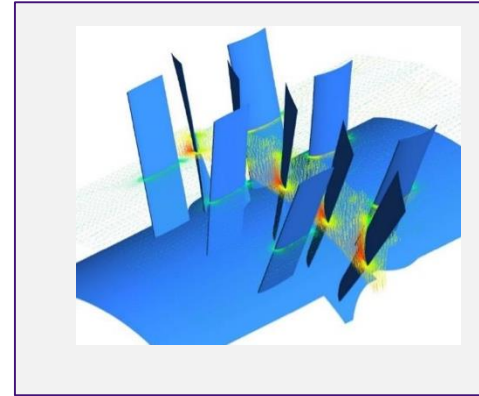
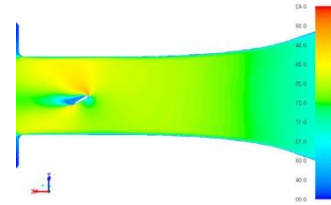
- Vacuum and weld integrity testing of 3.3m diameter tube
- 300m tube delivered Dec 2015
- Additional ~1800m scheduled for Apr/May 2016 delivery





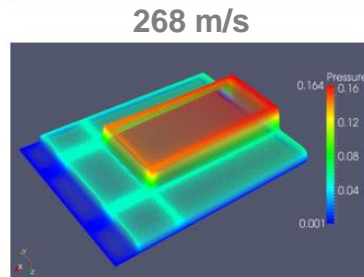
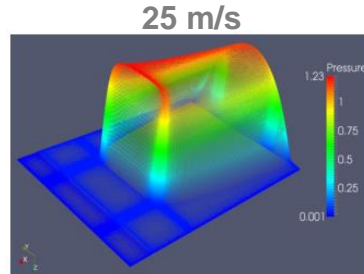
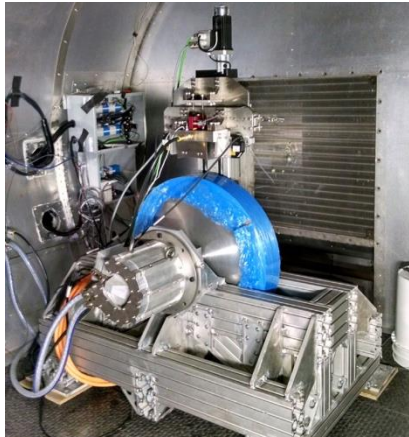
# AERODYNAMICS TESTING

- Operational high-speed low-pressure wind tunnel
  - Designed and built unique rig in-house in 10 weeks
- Validation of pod and compressor aero CFD
  - Advanced 2D blade design optimization
  - Performance mapping



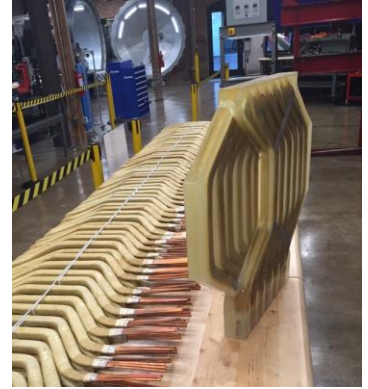
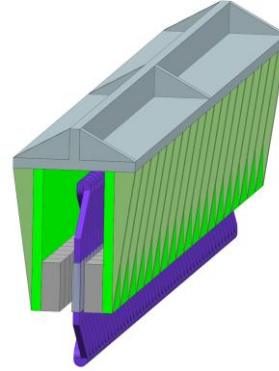
# LEVITATION DEVELOPMENT

- Controlled pressure (near vacuum) environment
- Spinning wheel creates relative velocity  $> 700$  mph
- Using existing autoclave for vacuum section
- Rig designed to test air bearings as well as maglev technologies



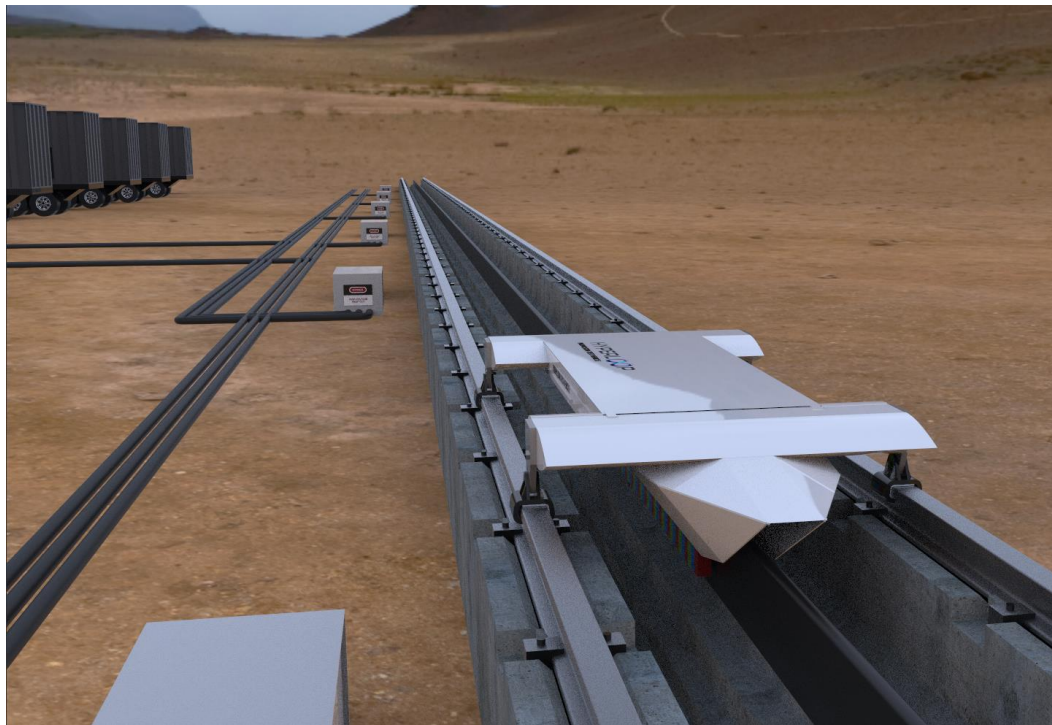
# PROPULSION DEVELOPMENT

- Custom designing our own Linear Synchronous Motor
- 20m of stator windings received in house
  - Patent pending on modular configuration
- Procured Variable Frequency Drive (VFD) for Propulsion Open Air Test (POAT) and Dev Loop
- Custom designing our own VFD for Production
- Ramping up high-power expertise in-house





# PROPULSION OPEN-AIR TEST



## Propulsion Validation

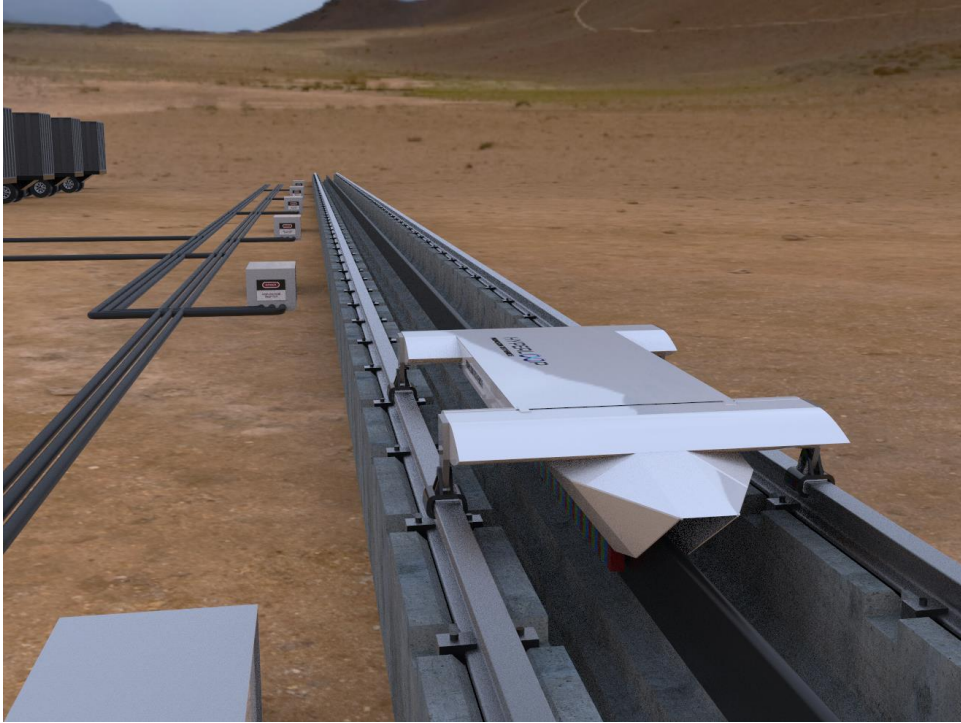
**0-540 km/h in 2 sec  
in Q1-2 2016**

- Custom linear electric motor designed for full speed operation at 300 m/s
- Power electronics and supporting medium voltage power & signal conditioning components
- Validates fully automated controls



# PROPULSION OPEN-AIR TEST

HYPERLOOP



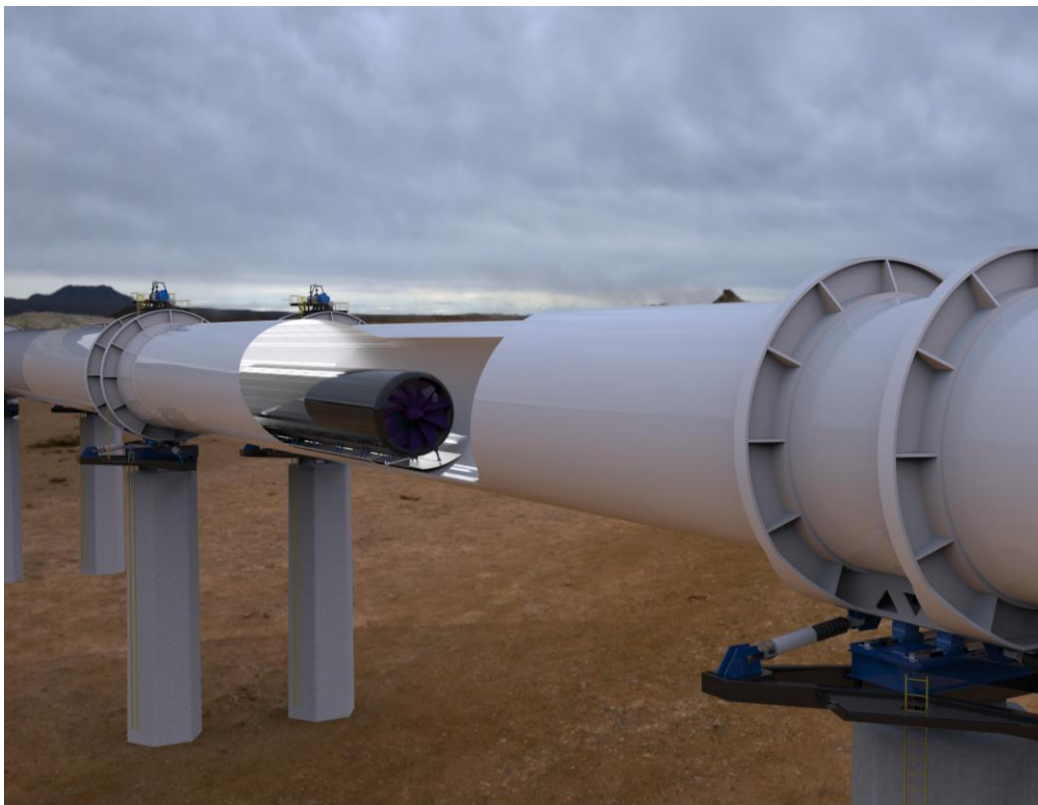
# PROGRESS AT TEST & SAFETY SITE

HYPERLOOP



North Las Vegas, NV

# DEVELOPMENT LOOP



## Full System Test

### Full Scale, Full Speed, Fully Operational in Q4 2016

- Length: 2 mi +
- Speed: 700 mph
- System level demonstration of all core elements:
  - › Ultra-low pressure environment
  - › Compressor
  - › Levitation
  - › Electric propulsion



# KITTY HAWK, NC - 1903

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# WRIGHT BROTHER'S WIND TUNNEL

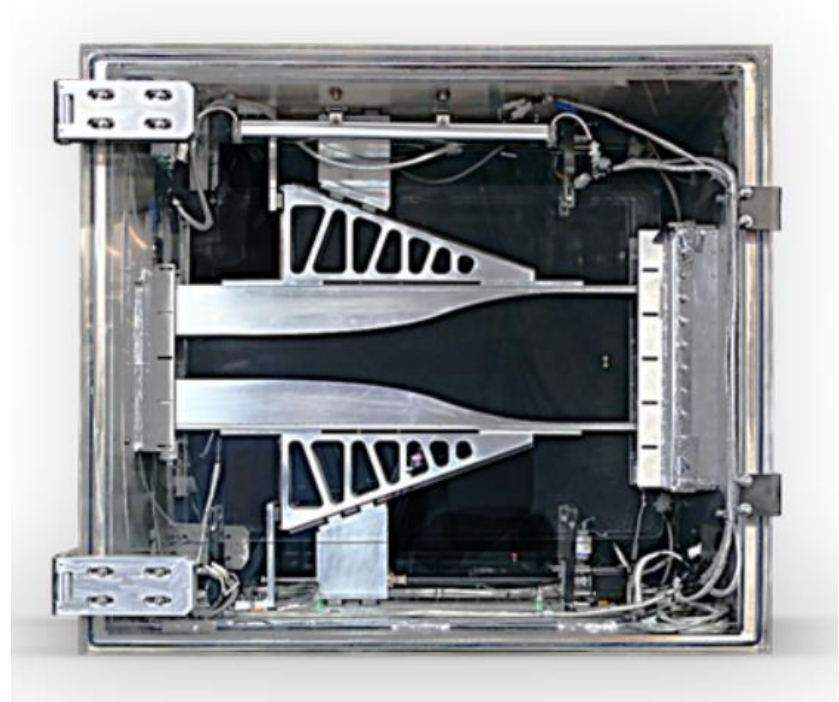
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HYPERLOOP



# HYPERLOOP TECH'S WIND TUNNEL

HYPERLOOP





# HYPERLOOP

THE QUESTION IS NOT “IF ?”  
...IT’S “WHEN ?”

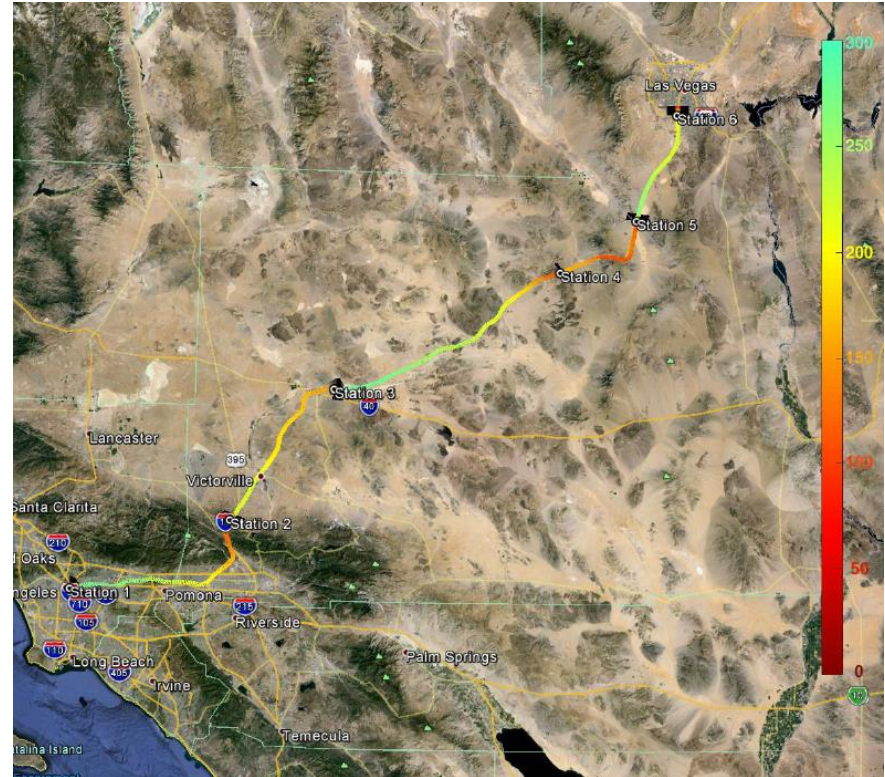
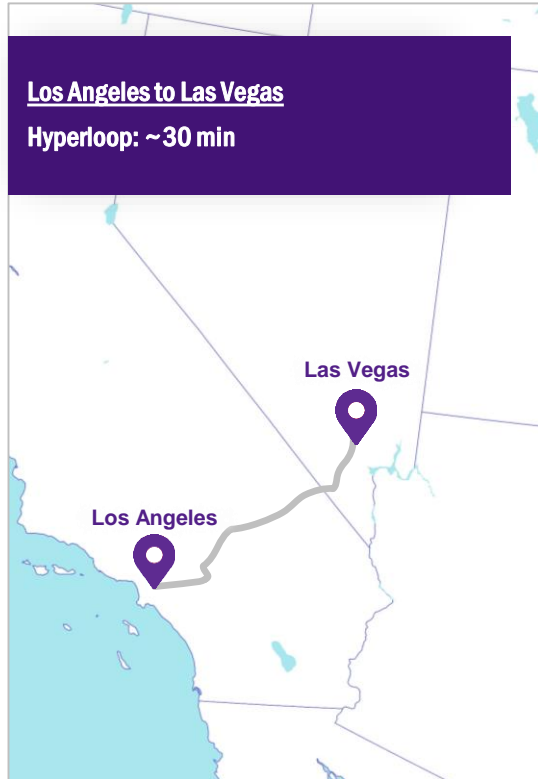
# PASSENGER EXPERIENCE

HYPERLOOP





# INTERCITY CONNECTOR





## ENABLES DRY PORTS

- Independent port connected to coastline via tunnels or located deep inland to new distribution centers
- Provides scalable capacity, increases efficiency and integrates with advanced tech in port logistics, inventory management, and data solutions
- Allows for network optimization



## MARSEILLE FOS PORT: TODAY







# MARSEILLE FOS PORT: FUTURE

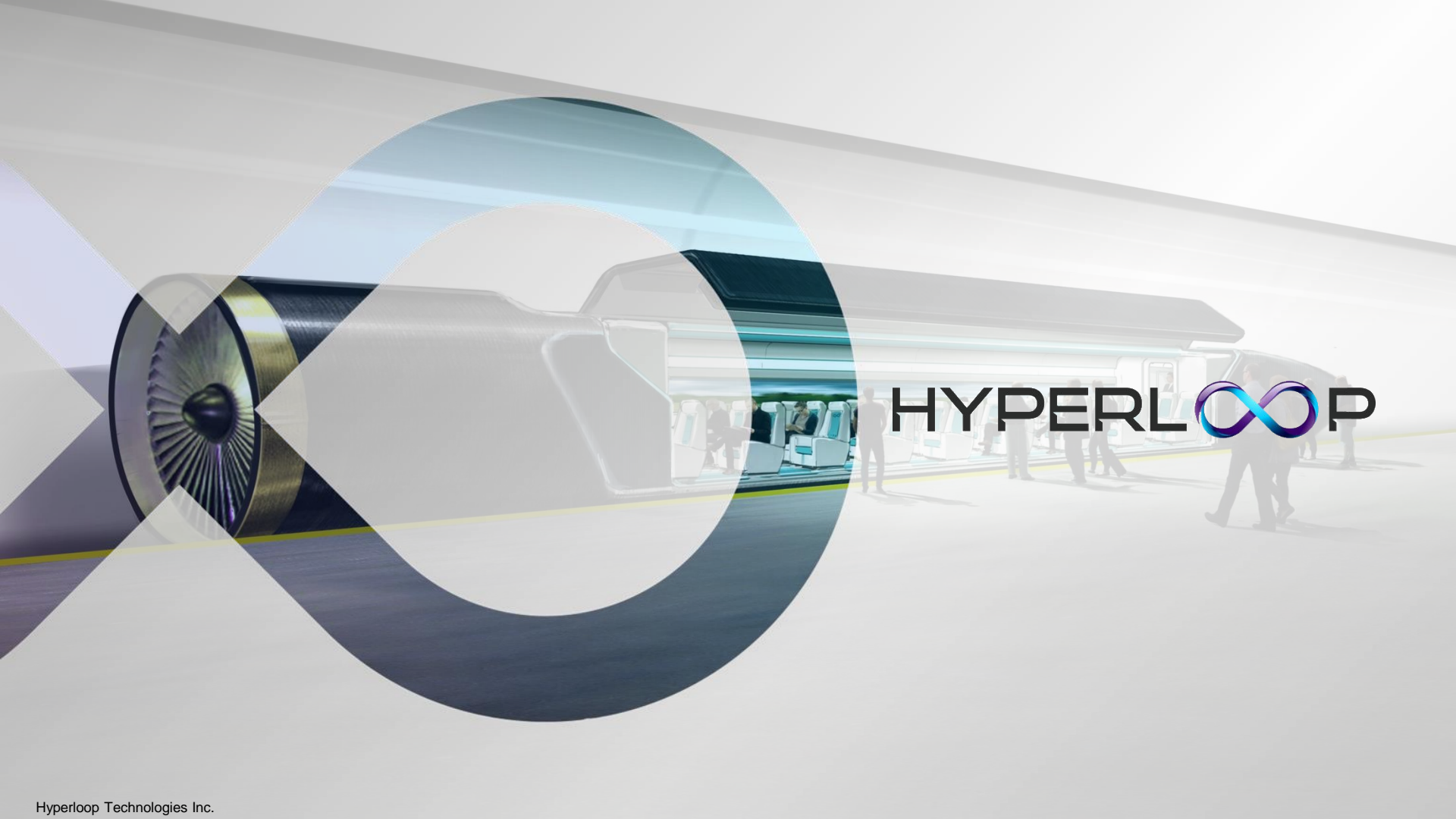
- 10,400 Hectares
- \$200B in Real Estate Potential



# THE FUTURE: COMING SOON!

HYPERLOOP 





HYPERLOOP