HYPERLOOP: CONNECTING THE GREAT LAKES MEGAREGION

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NOACA STRATEGIC PLAN AND VISION STATEMENT

NOACA will STRENGTHEN regional cohesion, PRESERVE existing infrastructure, and BUILD a sustainable multimodal transportation system to SUPPORT economic development and ENHANCE quality of life in Northeast Ohio.
BACKGROUND

GREAT LAKES HYPERLOOP
BACKGROUND

- There has been significant worldwide research and development regarding the development of a Hyperloop transportation system.
- The Hyperloop concept operates by sending specially designed "capsules" or "pods" through a steel tube maintained at a partial vacuum.
- Allows for the transportation of people and freight at a fraction of the time currently available through other transportation modes, notably cars and public transit.
- The Hyperloop concept is being pursued by several private interests looking to develop initial travel corridors, in coordination and cooperation with the United States Department of Transportation.
• NOACA and Hyperloop Transportation Technologies (HTT) formed an official Public Private Partnership (P3) on February 26, 2018

• Revealed plans for the Great Lakes Hyperloop starting with a feasibility study from Cleveland to Chicago.
  • Alternatives
  • Technical and financial assessment
  • Impacts
  • Costs
• **P3 Agreement components:**
  - **Obligations and Contributions**
    - Partners – NOACA and HTT
    - Total cost of the study - $1.2 M
      - NOACA (50%) - $600 K
      - HTT (50%) - $600 K
    - Proposed components consist of professional services, labor and funding
  - Partnership duration - until all defined services (partner and consultant) are delivered and the project completed
“Imagine”

https://www.youtube.com/watch?v=uwm3qvFWVRU
Introduction to
Hyperloop Transportation Technologies
Global team of experts

Offices

Contributors city

7 Offices

50+ Partners

800+ Professionals

40+ Countries
HyperloopTT System

Hyperloop brings airplane speeds to ground level, safely. Passengers and cargo capsules will hover through a network of low-pressure tubes between cities, transforming travel time from hours to minutes.
How it works

- Electromagnetic propulsion enables emission-free transport.
- Fully enclosed environment protected from weather and traffic crossing.
- Levitated capsule reduces friction, increases efficiency.
- Operational costs minimized through alternative energy and systems automation.
Structure

LOW PRESSURE ENVIRONMENT  
< 100 PA

ELEVATED ON PYLONS  
HEIGHT DEPENDING ON TERRAIN

4 M DIAMETER

SEISMIC ISOLATION  
TECHNOLOGY

30 M WIDE

POWERED BY ALTERNATIVE  
ENERGY SOURCES

Design credit: MAD Architects
Capsule

30 M LENGTH | 20 TONS WEIGHT
2.7 M DIAMETER

PASSIVE MAGNETIC LEVITATION

1,223 KM/H MAX / LEVITATION AT 40 KM/H

28-40 PASSENGER CAPACITY

160,000+ PASSENGERS DAILY

4,000+ CARGO SHIPMENTS DAILY

Design credit: PriestmanGoode
INTEGRATED OR NEWLY BUILT STATIONS

ADAPTIVE 40 SECOND DEPARTURE RATE

> 1,450 SQ M

0.1-1.6 KM

0.5G

SIZE

MINIMUM TURN RADIUS

ACCELERATION

Design credit: ANONYMOUS Architects
Achievements to date

Regulatory Framework
First set of Hyperloop core safety requirements and certification guidelines developed along with the first insurance framework for HTT worldwide systems

Hyperloop Labs
Hyperloop OS, Data & Analytics, Comfort & Entertainment, Augmented Workforce tools

Passive Levitation
Exclusive license for Inductrack™ from Lawrence Livermore National Laboratory

Government Agreements
USA, Slovakia, UAE, Czech Republic, France, Indonesia, Korea, India, Brazil and discussions in other regions

37 Trademarks
Hyperloop™ wordmark registered internationally

39 Patents
Technology patents

800+ Experts
Individuals organized in 50+ teams across 40+ countries through a crowd ecosystem structure

50+ Corporate Partners
Leading international companies
# Government Agreements

<table>
<thead>
<tr>
<th>Location</th>
<th>Details</th>
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</thead>
</table>
| Abu Dhabi, UAE                | • Feasibility Study completed  
                                 | • Royal strategic partnership  
                                 | • Agreement for the world’s first commercial Hyperloop system |
| Toulouse, France              | • Opened R&D facility for developing and testing Hyperloop related technologies  
                                 | • Started construction of first full-scale Passenger & Freight prototype |
| Minas Gerais, Brazil          | • XO Square, Global Logistics Innovation Center  
                                 | • Public-Private Partnership model |
| Great Lakes, United States    | • Public-Private Partnership agreement with broad industry consortium  
                                 | • Multi-state Feasibility Study |
| Andhra Pradesh, India         | • Pre-feasibility Study completed  
                                 | • Public-Private Partnership model  
                                 | • Initial focus on Andhra Pradesh |
| Jakarta, Indonesia            | • Feasibility Study agreement  
                                 | • First agreement in Southeast Asia  
                                 | • Initial focus on Jakarta |
| Brno, Czech Republic          | • Feasibility Study agreement  
                                 | • Exploration for a Hyperloop system connecting Brno and Bratislava, Slovakia |
| KICT, South Korea             | • Co-development agreement  
                                 | • Infrastructure R&D collaboration |
| Bratislava, Slovakia          | • Pre-feasibility Study completed  
                                 | • Explore building a local Hyperloop system, with the vision of creating future routes |
Why Great Lakes

“This is a critical corridor of commerce in the United States with millions of people and tons of cargo passing through it every year. We’re pleased to be taking a historic first step towards a regional network.”

Dirk Ahlborn, CEO and Co-founder of Hyperloop Transportation Technologies

Demand

- Over 50 million people live in the Great Lakes Megaregion, with a projected 71.3 million people by 2050.
- One third of U.S. freight activity takes place in the Great Lakes Megaregion.
- Over 10 million trips between Cleveland and Chicago are made each year.

Advantage

- Producing over $6 trillion in GDP every year, the Great Lakes Megaregion is home to over 20% of U.S. employment.
- This is equivalent to 46 million jobs and 17% of the annual U.S. GDP.
- Great Lakes also houses key resources beneficial in building North America’s first Hyperloop.

Potential to connect five of the largest cities in the US and Canada
Each year, the Great Lakes-St. Lawrence region contributes roughly USD $232 billion to Canada-U.S. trade.

The region is home to 20 of the top 100 universities in the world.

The region accounts for 29% of R&D in the U.S. and Canada.

The Great Lakes-St. Lawrence region has a GDP of USD $5 trillion (non-farm economy).

The region supplies 46 million jobs or nearly 30% of the combined U.S. & Canadian workforce.

The region supplies 40 million households in the U.S. and Canada.

The Great Lakes contain about 20% of the world’s surface freshwater supply.

The Great Lakes provide drinking water to 105 million people.

The varieties of wildlife and habitats make the basin a unique & complex ecosystem.

The region accounts for roughly 28% of combined Canadian & U.S. economic activity.
Why Cleveland to Chicago
Why Cleveland to Chicago

Opportunity

- Millions of hours are spent traveling between Cleveland to Chicago, with Hyperloop a monetized annual time savings of over $270 million is possible.
- The region is rich in uniquely skilled and motivated workers benefiting industrial development, manufacturing and infrastructure.
- Work with numerous supporters within this corridor.

Vision

- Further support long standing commitment to innovation and ingenuity in transportation technology and modernization.
- Attract talent and guide technological advancement across the region through intellectual capital and resources.
- Lead the way in connecting the Great Lakes Megaregion becoming a key hub for the next transportation revolution.

Cleveland to Chicago in under 30 minutes
“Where You Build Dreams”

https://www.youtube.com/watch?v=YMKstW3B_IA&feature=youtu.be
PARTNERS

Feasibility Study Funding Commitments
PARTNERS
Hyperloop Collaborators

[Logos of various organizations involved in Hyperloop projects]
PROJECT SCOPE

Four Phases

• Project Objectives and Organization
• Site Reconnaissance and Preliminary Route Analysis
• Technical and Financial Feasibility
• Project Development Cost and Schedule
KEY DELIVERABLES

- A comprehensive intercity travel market analysis for the base and forecast years.
- An assessment of potential routes and stations based on existing and historic analysis of options.
- A review of HyperloopTT technology and its potential operating schedules and costs on different routes and for different stopping patterns.
- Both a financial and economic analysis of potential options and their ability to meet USDOT funding requirements.
- Output of community benefits to provide input to the stakeholder and community groups to identify the project pros and cons.
- Preparation of a Business Plan report for use in assessing the project viability and its ability to achieve fundability, and its likely economic changes on the economy of the corridor and subsequently the economy of the Midwest and Northeast corridor.
### Schedule/Timeline

<table>
<thead>
<tr>
<th>Phase</th>
<th>Time</th>
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<tbody>
<tr>
<td>Phase 1: Project Objectives and Organization</td>
<td>8 weeks</td>
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<tr>
<td>Phase 2: Site Reconnaissance and Preliminary Route Analysis</td>
<td>9 weeks</td>
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<tr>
<td>Phase 3: Technical and Financial Feasibility Study</td>
<td>11 weeks</td>
</tr>
<tr>
<td>Phase 4: Project Development Cost and Schedule</td>
<td>8 weeks</td>
</tr>
<tr>
<td><strong>TOTAL MAXIMUM FEASIBILITY STUDY TIME PERIOD</strong></td>
<td>36 weeks</td>
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Capsule

Design credit: PriestmanGoode