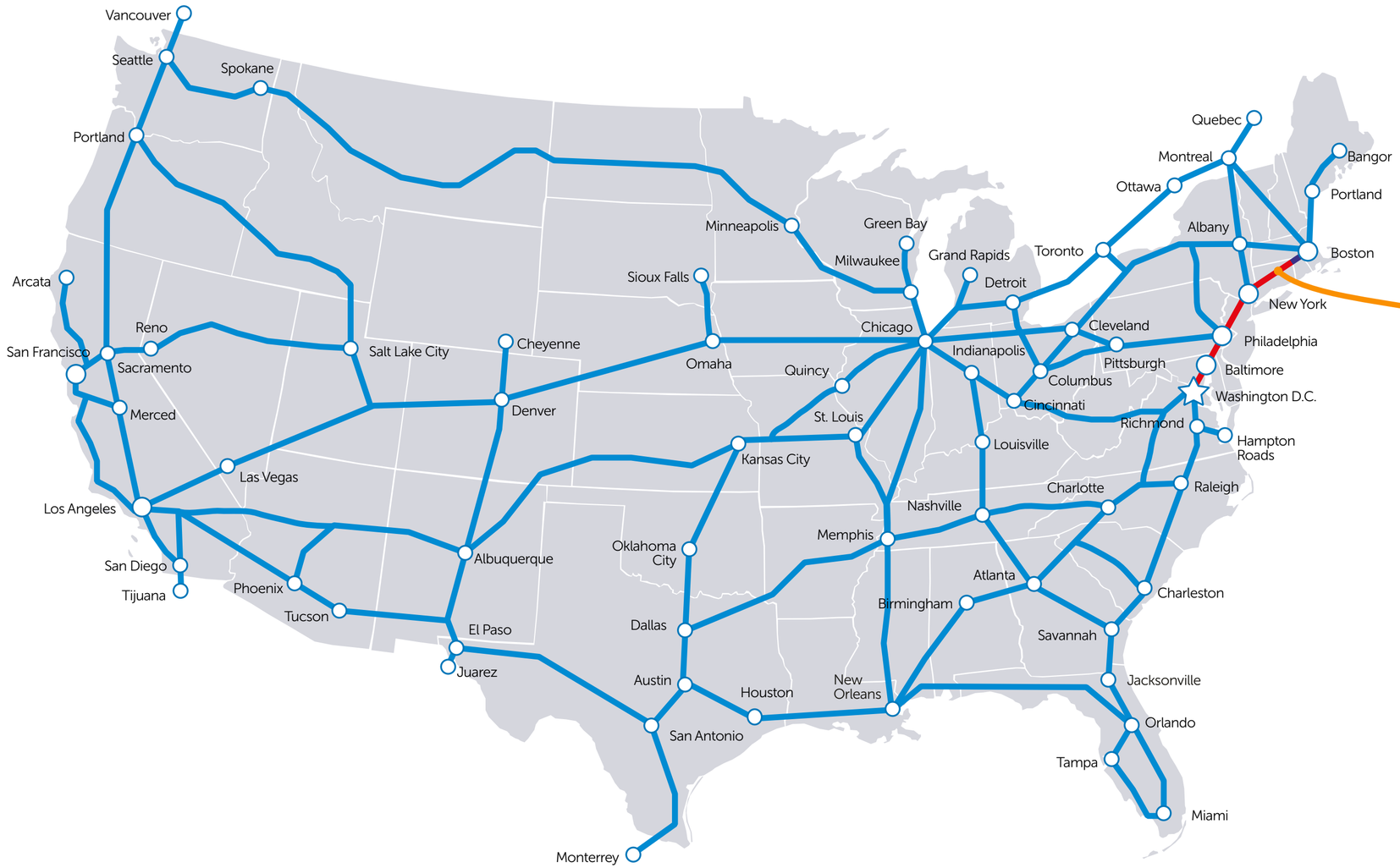
uST HIGH-SPEED TRANSPORT AND INFRASTRUCTURE SOLUTIONS FOR THE USA

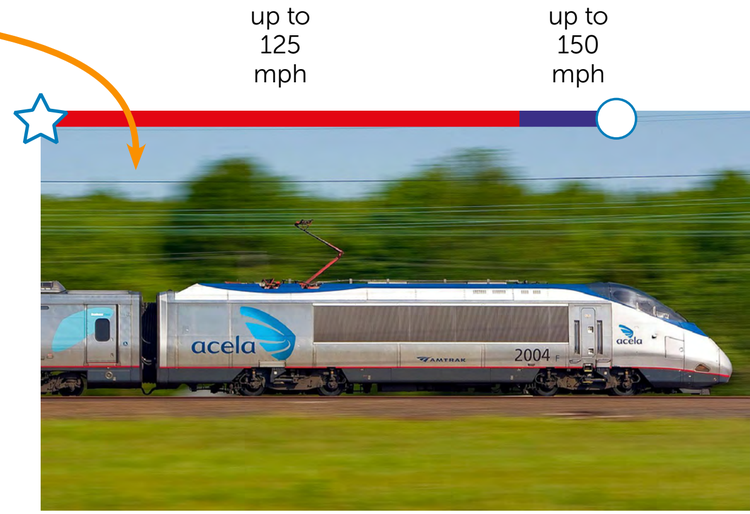
High-Speed Transport Highways:

- An indicator of the high level of technological progress and competitiveness of the country;
- Continuous technological development in the transport, energy, production and infrastructure sectors;
- An impetus to economic development through the creation of a fundamentally new production base, the loading and expansion of existing industries, and the increase in mobility of the population;
- New jobs for highly qualified personnel;
- The impulse for spatial development, improvement of regional connectivity, optimization of transport and logistics infrastructure;
- Realization of the country's transit potential;
- High level of environmental friendliness and reduced greenhouse gas emissions;
- Saving public sector funds through environmental protection measures and maintenance of road and aviation infrastructure;
- Reducing dependence on imported energy resources (oil).

High-Speed Transport Links in the USA



The potential volume of the U.S. high-speed highway market by 2040 could be about $1.2 trillion (30,000 miles long).



The USA high-speed (medium-speed) railway line (Washington — Boston route) The length of the line is 456 miles.

The USA is on the Way to Developing its High-Speed Rail Routes

Project	Status	Capital expenditure (estimate)	Length	Maximum speed
Dallas — Houston High-Speed Rail	Project is under review and approval since 2016	$30 billion	236 miles	Up to 200 mph
Atlanta — Charlotte High-Speed Rail	Project is under review and approval since 2019	$8,4 billion	274 miles	Up to 220 mph
California High-Speed Rail	Under construction (Merced — Bakersfield section)	$128 billion	1200 miles	Up to 220 mph
Brightline West High-Speed Rail (Las Vegas — Los Angeles)	Under construction since 2023	$12 billion	218 miles	Up to 200 mph

The difficulties of implementing the HSR in the USA:

- High estimated cost and duration of projects;
- Long-term project coordination and approval process;
- Lack of support from the population due to the withdrawal of a large amount of land from private land use.

Solutions for High-Speed Transport Around the World

China

The entire HSR network length: 16700 miles

Speed: up to 230 mph

Beijing-Zhangjiakou high-speed rail line

Length: 108 miles

Cost: $9,2 billion
($85 million per 1 mile in 2019 prices)

Taiwan

The entire HSR network length: 220 km

Speed: up to 220 mph

THSR (Taiwan High Speed Rail) Taipei-Kaohsiung route

Length: 221 miles

Cost: $18 billion
(more than 90% of its length is built as an overpass)
($81,5 million per 1 mile in 2007 prices)

Japan

The entire length of HSR network+maglev: 2240 miles

Speed: up to 225 mph

Hokuriku Shinkansen Tokyo-Kanazawa Route

Length: 214 miles

Cost: $25 billion
($117 million per 1 mile in 2015 prices)

Spain

The entire HSR network length: 2460 miles

Speed: up to 190 mph

Atlantic Axis high-speed rail line La Coruna-Vigo route

Length: 103 miles

Cost: $2,9 billion
($28,2 million per 1 mile in 2015 prices)

Germany

The entire HSR network length: 2240 miles

Speed: up to 186 mph

InterCity Express Berlin-Munich route

Length: 417 miles

Cost: $16,5 billion
($40 million per 1 mile in 2017 prices

America can go a fundamentally different way

uST Is an Innovative Way to Develop the High-Speed Transportation Industry in the USA

uST is high-speed transport and infrastructure solutions based on the use of patented string rail technologies, a prestressed string rail transport overpass and unmanned electric rail vehicles on steel wheels produced using know-how.

uST high-speed transport and infrastructure solutions are:

- Faster — up to 300 mph
- Cheaper — from $ 16 million per mile
- Safer — the second level of traffic and the exclusion of accidents
- More environmentally friendly — zero emissions of CO_2 and other exhaust gases
- More affordable — low cost of travel and the possibility of purchasing a small-seat uPod (with a capacity of up to 6 passengers) for private use
- More versatile — uPods, both public and private, can travel not only on string rails, but also on existing railway tracks

uST Is an Alternative That is Fundamentally Different From the World's Existing High-Speed Rail Transport Solutions

Surface high-speed railway *vs.* uST	
185–235	**Maximum speed, mph**	280–340
50–80 on average	**Cost, $ million per mile**	from 16, but no more than 30
Significant changes in the landscape and disruption of the natural ecosystems and biogeocenoses' functioning. Removal of a large amount of land for railway tracks — up to 28–32 hectares per 1 mile	**Environmental friendliness**	Conservation of natural ecosystems, biogeocenoses, soil hydrology and animal migration routes by raising the track structure above the ground. Minimum land acquisition — pointwise for supports (less than 0.4 acres/mile)
Specific power of 70–80 kW/pass (at a speed of 300 mph)	**Energy efficiency**	Specific power of 10–15 kW/pass (at a speed of 300 mph)
High cost of travel, linking users to the train schedule and the impossibility of purchasing a train for private use	**Accessibility**	Low cost of travel and the possibility of purchasing a small-seat uPod (up to 6 passengers) for private use (at a price lower than the cost of a conventional car or an electric car) with a free schedule on the road network (including the existing railway network at the first level)
Trains can only travel on railway tracks	**Versatility**	A rail electric vehicle on steel wheels (uPod) can travel not only on string rails, but also on existing railway tracks thanks to the same logistical standards — 4 ft 8+1/2 in gauge and steel wheels combined in wheel pairs

uST: High-Speed Solutions in Overpass Design

Raising the track structure above the ground allows to:

- Bypass difficult landscape conditions, avoid high costs of excavation and reclamation;
- Minimize land acquisition, i.e. reduce the need for extensive land allotment and minimize disturbances in adjacent natural ecosystems and biogeocenosis;
- Increase the speed of movement, i.e. to develop a higher speed by minimizing the number of turns and height difference;
- Improve the ecological situation by preserving the natural habitat of living organisms and ensuring their migration routes. We should not violate the integrity of natural ecosystems by building roads, but instead use the land underneath the highway for agricultural and other activities.

uST: Improved High-Speed Transport Solution in the Overpass Design

The existing high-speed solutions in the overpass design (the high-speed railway in Taiwan and the Transrapid magnetic cushion train) have a big disadvantage — high material consumption and, accordingly, cost.

Consumption of structural materials

Materials	Railway in overpass design (using the example of HSR in Taiwan)	uST	Saving of structural materials in the implementation of high-speed highways based on uST technology
Reinforced concrete	190,000 t/mile	Up to 3,500 t/mile	186,500 t/mile
High-strength steel	20,000 t/mile	Up to 2,100 t/mile	17,900 t/mile

The creation of the USA high-speed highway network based on uST technology with a total length of 30,000 miles (potential US market) will save about 540 million tons of steel, 5.6 billion tons of reinforced concrete and 1 trillion tons of soil, construction sand and stone used in the construction of an earth embankment.

Saving such a large amount of building materials will significantly reduce the volume of extraction of mineral resources and environmentally hazardous and carcinogenic substances formed during the production of metals and cement and further released into the atmosphere.

uST High-Speed Solution: Big Savings

Low material consumption (resource consumption) of the uST string rail transport overpass

Up to 15 times compared to conventional railway tracks and beam overpasses

Savings on construction and installation work

Exclusion of earth embankments, recesses, bridges, overpasses, multi-level interchanges, tunnels and culverts by 100%

Saving money on the withdrawal of land from land use

Up to 100 times compared to the existing ground-level transport systems built on an earthen embankment

Low power consumption

Due to the high aerodynamic characteristics of an electric rail vehicle, the use of a “steel wheel — steel rail” pair and the exclusion of the airfoil effect (roadway)

For every thousand kilometers of high-speed uST routes, approximately $1 billion worth of fuel (energy) will be saved annually.

uST Transport Communications: High Level of Environmental Friendliness

- Absence of harmful emissions and impacts: exhaust gases, wear products of pneumatic tires and asphalt, electromagnetic radiation, etc.;
- Low resource consumption — saving material and energy resources of the country;
- Low noise (both inside and outside the cabin) and vibration;
- Minimal withdrawal of fertile soil from land use — pointwise for supports;
- Low volume of earthworks — the absence of special structures (earth embankments, excavation, tunnels) that violate the natural landscape;
- No need to use de-icing salts during uST operation, which have a negative impact on the environment and the human body.
- Preservation of natural ecosystems and geobiocenoses and the absence of obstacles to the migration of wild animals, the movement of agricultural and special equipment.

The creation of the uST high-speed network in the United States will save millions of hectares of land for agriculture and preserve biological diversity and the natural biosphere balance.

One Airbus burns about 2.7 million tons of fuel over a 20-year period of operation	With a similar capacity, the high-speed uST train will use about 0.2 million tons (in terms of conventional fuel) of more environmentally friendly energy, which is electricity, over a 20-year period.
Significant environmental damage to the Earth's atmosphere, soils and waters (fuel combustion products eventually fall with precipitation to the surface of the planet), that is also caused due to the destruction of the ozone layer.	Absence of any damage

uST: Stable and All-Weather Operation

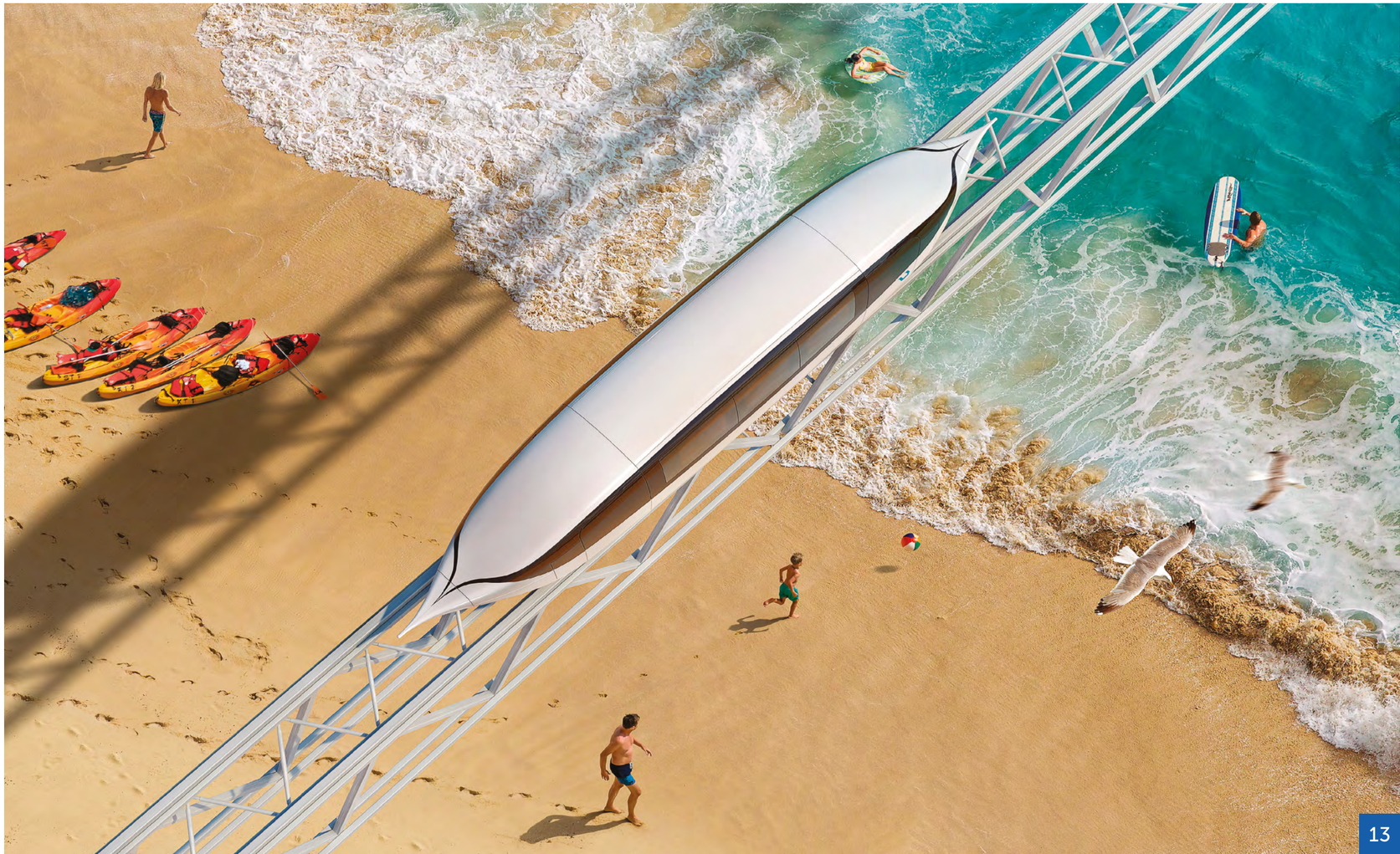
uST high-speed solution offers maximum stability to extreme natural and man-made impacts, enabling safe 24/7 operation of uST transport and infrastructure complexes in any natural or climatic zone.

It excludes the impacts of:

- Hurricane-force winds (124–155 km/h or more);
- Heavy rainfall and flooding (water depths of 5.5–11 yards and more);
- Snowfall and drifts (snow cover of 3.3–5.5 yards and more);
- Dust storms and sandstorms;
- Icing and fog;
- Earthquakes and tsunamis;
- Extreme heat (up to +140°F in sunlight) and extreme cold (down to –140°F).

uST Transport & Infrastructure Solutions: An Unprecedented Level of Safety

- Eliminating accident risks by elevating the track structure above the ground;
- Pedestrian walkways on both sides of the track structure, allowing passengers to safely exit the uPod in case of emergency (e.g., fire) and descend to the ground at a safe distance;
- No human factor thanks to the automated control system and AI integration;
- A multi-layered anti-derailment system, ensuring steel wheels remain on the rails;
- Fire and electrical safety: no onboard fuel tanks or flammable batteries, and no high-voltage overhead lines (power is supplied to the vehicle via string rails and steel wheels);
- Resistance to terrorist attacks and vandalism.



uST High-Speed Transport Solutions: Large-Scale Impact

The practical implementation of innovative uST technology will transform the country's high-speed transport industry.

The delivery of uST high-speed transport solutions will make the USA a flagship of innovation and lead the global market in fundamentally new efficient, environmentally friendly, and safe high-speed transportation.

The creation and development of industry-shaping uST high-speed technology will become the growth driver across related industries involved in both the construction and operation of the high-speed road network for at least the next 100 years.

The demonstration of unique uST technology in the USA will enhance environmental sustainability across the global transport and infrastructure industry.

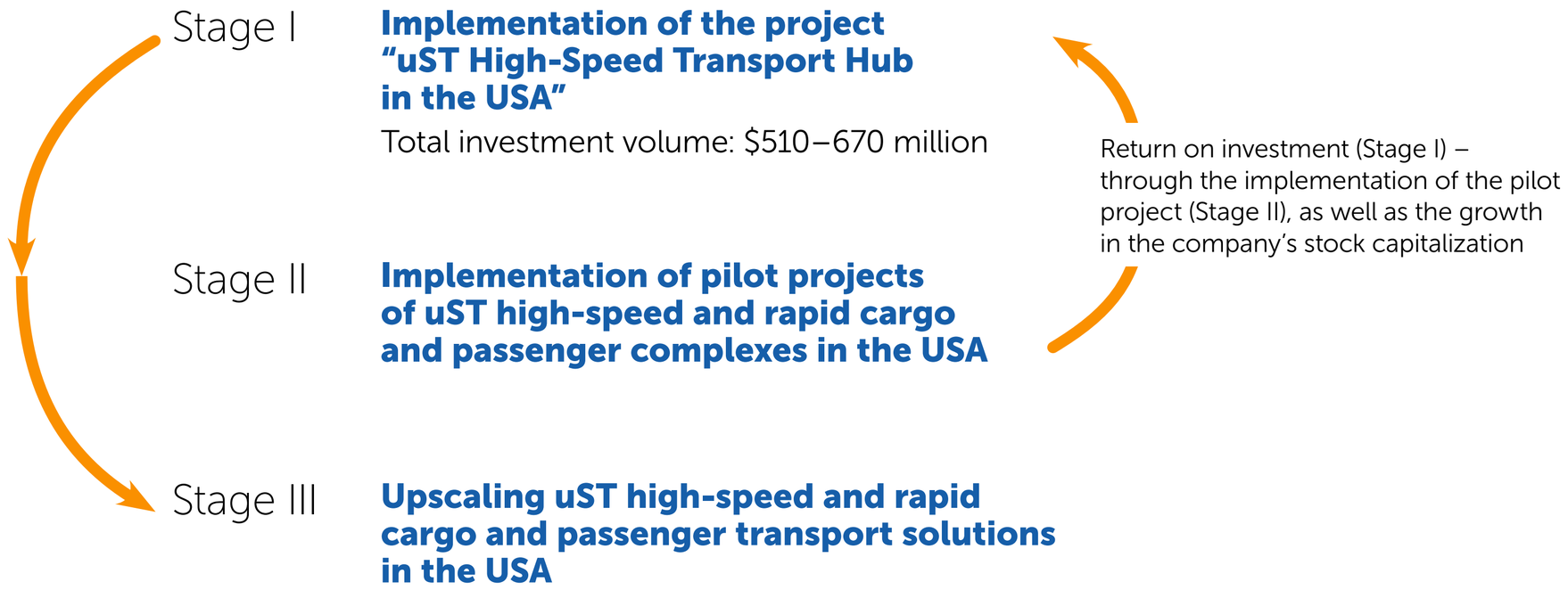
Making America Great

19th century:
railroads

20th century:
road transport and aviation

21st century:
**string transport —
a breakthrough transport
and infrastructure industry**

Stages of Transformation for the USA High-Speed Transport Systems Based on uST Technology



Stage I

uST High-Speed Transport Hub in the USA

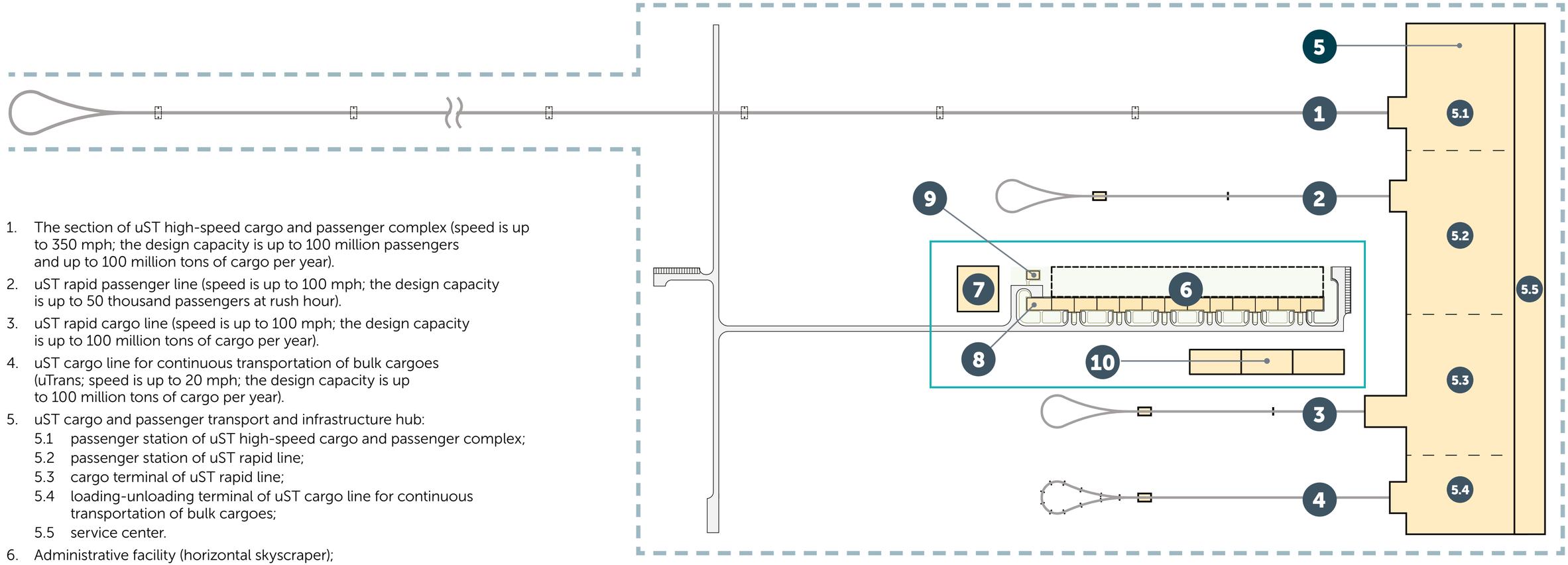
Project objective:

- Large-scale demonstration of high-tech innovative developments and ready-made uST transport solutions to potential customers; showcasing the intermodality of uST transport and infrastructure solutions and the interconnection of a multilevel transport chain for passenger and cargo transportation;
- Attraction of investment;
- Implementation of solutions tested as part of the project in the USA in the logic of «Making America Great.»

The project consists of a collection of unique proprietary developments adapted to address global transportation challenges and enhance the efficiency of transportation service.

The uST high-speed transport hub is a transport and infrastructure facility that serves as a platform for demonstrating, testing and implementing uST high-speed solutions, along with their international expertise and certification.

uST High-Speed Transport Hub in the USA



1. The section of uST high-speed cargo and passenger complex (speed is up to 350 mph; the design capacity is up to 100 million passengers and up to 100 million tons of cargo per year).
2. uST rapid passenger line (speed is up to 100 mph; the design capacity is up to 50 thousand passengers at rush hour).
3. uST rapid cargo line (speed is up to 100 mph; the design capacity is up to 100 million tons of cargo per year).
4. uST cargo line for continuous transportation of bulk cargoes (uTrans; speed is up to 20 mph; the design capacity is up to 100 million tons of cargo per year).
5. uST cargo and passenger transport and infrastructure hub:
   - 5.1 passenger station of uST high-speed cargo and passenger complex;
   - 5.2 passenger station of uST rapid line;
   - 5.3 cargo terminal of uST rapid line;
   - 5.4 loading-unloading terminal of uST cargo line for continuous transportation of bulk cargoes;
   - 5.5 service center.
6. Administrative facility (horizontal skyscraper);
7. Agrobio-production facility (uTerra organic fertilizer production);
8. Energy complex (BioTPP is a relic solar bio-power plant firing brown coal and/or oil shale and/or peat, the waste of which is uTerra organic fertilizer);
9. Traction power substation;
10. Experimental production facility (production of the rolling stock elements, i.e. rail electric vehicles and uST infrastructure).

Rendering of Hub Elements

uST high-speed cargo and passenger complex

uST rapid cargo line

uST rapid passenger line

uST cargo line (uTrans)

Rendering of Hub Elements

Administrative facility

Energy complex

Agrobio-production facility

Experimental production facility

Stage II

Pilot Project Version of uST High-Speed Complex in the USA

Route: San Francisco to Los Angeles

Optimal route
length of 345 miles

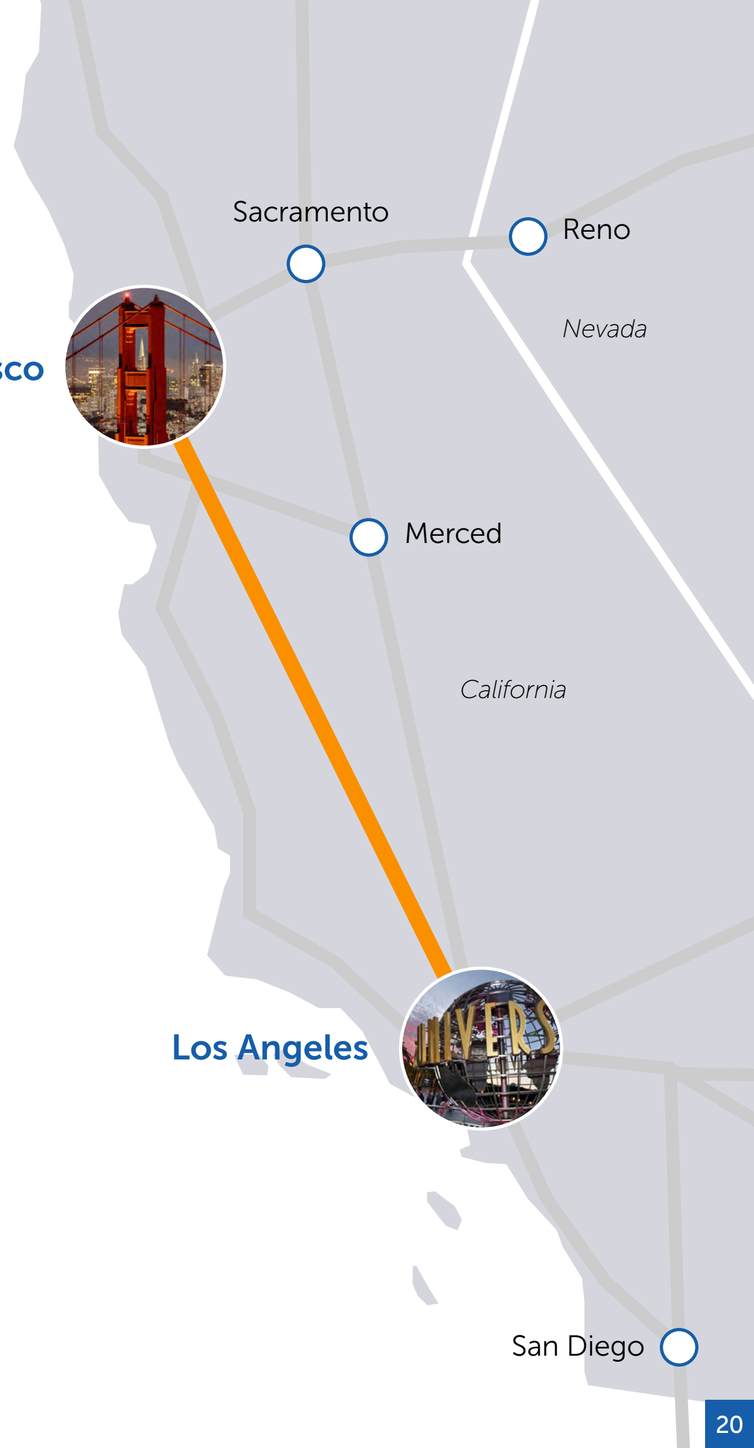
High speed
up to 300 mph

Low cost
starting at $16 million per mile (not exceeding $30 million per mile)

High capacity
up to 100 million passengers per year

Quick project implementation timeline:
3–5 years

High return on investment of the project
15% per year



Effectiveness of uST Pilot Project

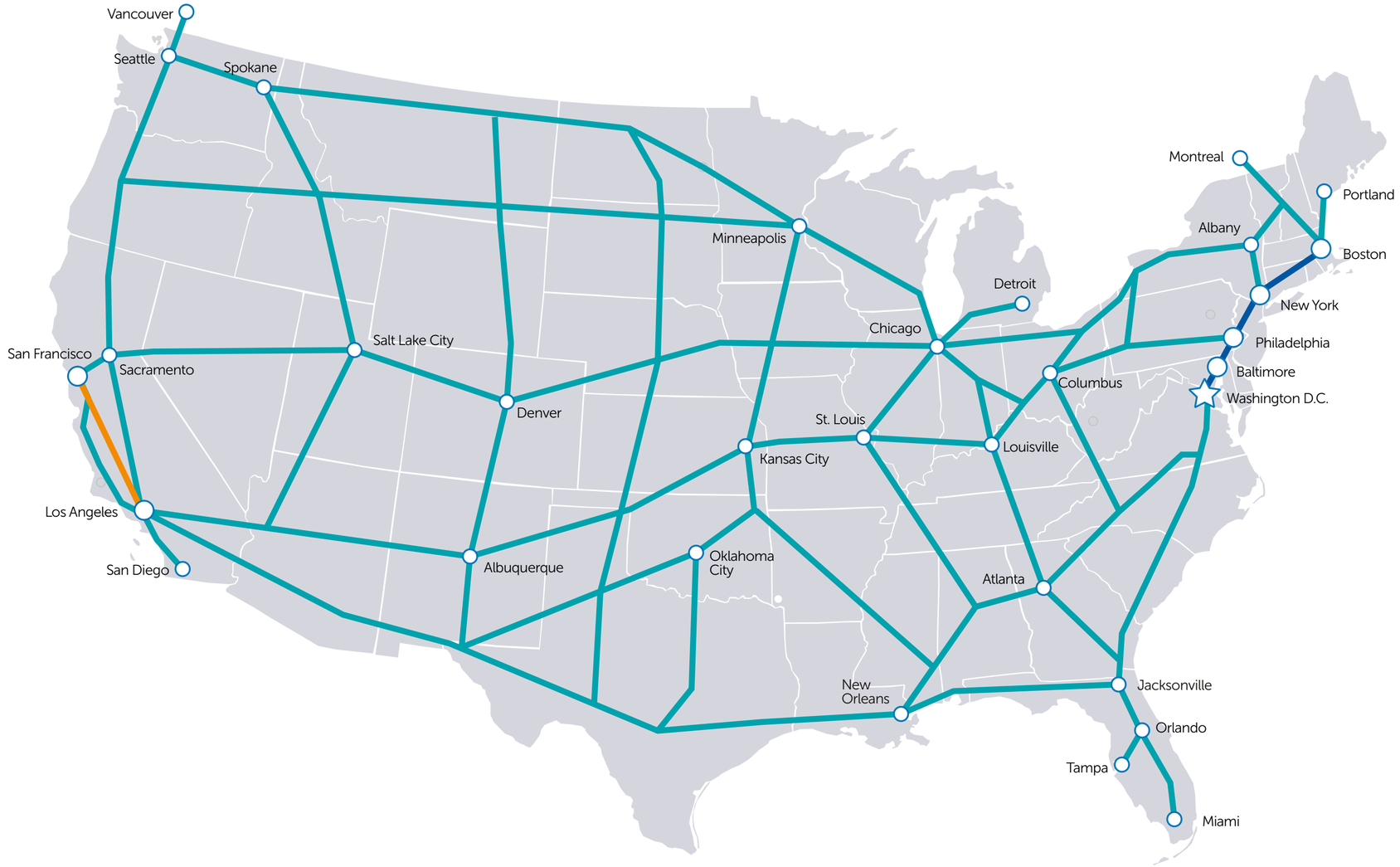
Route: San Francisco to Los Angeles

- The fastest and most convenient mode of transportation;
- Affordable ticket prices;
- Maximum comfort during the journey — no long stops or transfers;
- The highest level of safety and reliability of the uST transport system;
- High level of eco-friendliness — no CO_2 emissions or other exhaust gases.

Parameters	uST High-Speed Complex	Train (with transfers)	Bus	Car	Airplane
					
Distance	**345 miles**	472 miles	396 miles	383 miles	347 miles
Average trip duration	**1 hr 30 min**	9–13 hrs	9–12 hrs	6–8 hrs	1 hr 30 min (+1 hr for check-in and +1 hr for travel to/from the airport
Frequency of service	**from 1 min**	1–3 times a day	5–15 trips	On demand	35–50 flights (one way)
One-way fare	**$25 – $50**	$56 – $190	$30 – $110	$70 – $100 (gasoline)	$65 – $270
CO_2 emissions	**None**	86 lbs/passenger	93 lbs/passenger	196 lbs/passenger	247 lbs/passenger

Stage III

Upscaling of uST High-Speed Transport Solutions in the USA



The US high-speed train line (Washington - Boston route)

The pilot project of uST high-speed complex along the route from San Francisco to Los Angeles

Option for further upscaling of the US high-speed transport systems on the base of uST technology

Anatoli Unitsky

Founder of the International Group of Companies

- Creator of the breakthrough engineering technologies in transport, construction, energy, urbanization and agriculture
- Engineer, author and general designer of the string transport systems
- Chairman of the Board of Directors of Unitsky String Technologies Inc. engineering company
- Author of uSpace program, developer of the “General Planetary Vehicle” geospace non-rocket logistics
- Project manager of two UN projects
- Member of the Transportation and Development Institute of ASCE, Member of the Engineering Mechanics Institute of ASCE, Member of the Coasts, Oceans, Ports and Rivers Institute of ASCE, Member of the Architectural Engineering Institute of ASCE, Member of the Environmental and Water Resources Institute of ASCE.

Unitsky Group of Companies

International Group of Companies offers solutions for high-speed passenger and cargo transport, as well as the aboveground logistics infrastructure.

Unitsky Group of Companies is an ecosystem consisting of more than 20 scientific, research, design, production, construction, agrobiological, agricultural and marketing entities located in 7 countries of the world.

The Group of Companies employs more than 1000 engineers and researches capable of ensuring a complete development cycle of uST high-speed transport and infrastructure complexes in the overpass design.

Project Office
(Minsk, Belarus)

Scope of activity:

- design and research;
- development;
- science;
- commercial projects.

600+ specialists of various fields: engineers, designers, technicians, logisticians, builders, economists and others.

Production Complex
(Minsk, Belarus)

Industrial development of technological solutions, basic components and know-how for transport and infrastructure complexes, including a full cycle of small-scale production of the electric vehicles on steel wheels

- Production of components, parts and nodes, including electric motor-wheels, traction motors, electric energy storage units, etc.
- Testing of mechanical units, equipment and electronics of particular systems (bogie, automated doors, air conditioning system, etc.) and the assembled uPods in general.
- Testing of the industrial samples, commissioning and certification work.

3590+ square yards of production premises

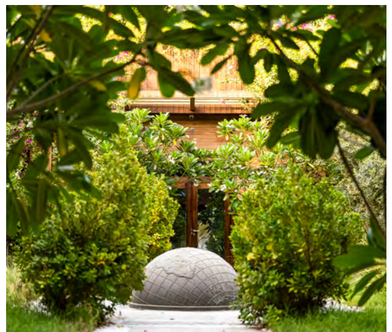
200+ specialists

Modern high-precision equipment

Test and Certification Centers — Global Experience in Implementing uST Technology

The technical concept of uST string transport has been implemented in the UAE transport and infrastructure system in the uSky Test and Certification Center in Sharjah.

- 2 passenger stations with service workshops
- Control room
- 2 types of string rail overpasses
- 3 models of passenger and cargo uPods with a capacity from 4 to 25 people, with a load capacity of up to 38.6 tons



Innovative and technological uST solutions are implemented in the EcoTechnoPark Test and Demonstration Center located in Maryina Gorka (Republic of Belarus).

- 2 passenger stations with service workshops
- 6 landing platforms
- Control room
- 5 types of string rail overpasses
- 12 models of passenger and cargo uPods with a capacity from 2 to 48 people, with a load capacity of up to 11 tons