

Unitsky String Technologies Inc.

# Positioning, marketing, naming

2022



# Content

## **4 Positioning of Unitsky String Technologies Inc.**

### **12 The cost of construction and operation of uST transport and infrastructure complexes**

### **14 Main transport and infrastructure competitors (manufacturers, cost, benefits, drawbacks)**

15 Monorail system

16 Light rail transport (LRT)

17 Cable way

18 Magnetic levitation transport (maglev)

19 Personal rapid transit (PRT)

## **20 Marketing strategy of Unitsky String Technologies Inc.**

### **24 Company and product naming**

25 Preamble to the section: the holistic nature of the product

26 The naming concept of Unitsky String Technologies Inc. and its product

27 The naming concept of uST vehicles

28 The name of the technology, intellectual product of the company, physical object embodied by the product, as well as the function performed by this physical object

28 The name of elements of uST transport and infrastructure complexes

## **30 Rebranding of Unitsky String Technologies Inc.**

# Positioning of Unitsky String Technologies Inc.

**Unitsky String Technologies Inc. (UST Inc.)**  
is an engineering company established in Minsk in 2015,  
accredited as a scientific organization  
at the National Academy of Sciences of Belarus  
and the State Committee on Science and Technology  
of the Republic of Belarus, which is engaged  
in the development, design, production,  
testing and operation of overpass transport  
and infrastructure complexes.

The company's product is the uST transport and infrastructure solutions, which are overpass transport communications, where the transportation of passengers and cargo is carried out automatically at a speed of up to 150 km/h and at a height of 6 m above the ground. The distance between the supports, on which the uST track structure is mounted, can reach 2,000 m, due to which it is possible to overcome water barriers, mountain gorges, pass over residential and industrial buildings, roads and railways, power lines. The load-bearing structures are distinguished by their visual lightness, which allows them to be seamlessly integrated into the infrastructure of cities and suburbs, optimizing the logistics system without the need to allocate significant areas and revise the configuration of existing transport and energy networks, layouts of residential and industrial buildings.

uST transport and infrastructure solutions:

- creation of prestressed string-rail overpasses;
- supply of unmanned electric vehicles and an automated control system;
- construction of related infrastructure facilities (stations, loading and unloading terminals, power grids, repair shops, amenity premises and commercial areas as part of complexes and etc.).

The creation of uST transport and infrastructure solutions is based on the structural and technological invention of engineer Anatoli Unitsky – a string rail, which is a key structural element of a prestressed string-rail transport overpass.

uST transport and infrastructure solutions based on the patented technologies of the string rail and string-rail transport overpass require minimal land acquisition for construction. They can be easily adapted to perform any logistics tasks in the field of urban and intercity passenger and cargo-passenger transportation.

uST complexes are distinguished by high efficiency, safety, reliability and durability, as well as significantly more favorable construction costs and minimal operating costs compared to other types of overpass transport (monorail, maglev train, surface metro, express tramway, cable way) and underground metro.

The special design of uST prestressed overpasses makes it possible to significantly reduce their material consumption, increase durability and reliability both under the influence of extreme natural and climatic factors (earthquake, flood, tsunami, storm wind, fog, ice-up, snow and sand drifts, etc.), and man-made (vandalism, terrorist acts, etc.).

uST urban complexes are designed to carry from 1,000 to 50,000 passengers per hour.  
Cargo is from 1 mln to 100 mln tons per year.

Control systems for uST transport and infrastructure complexes are automated and can be equipped with subsystems for machine vision, positioning, construction and correction of route tasks, threat recognition, as well as the signaling subsystem within the traffic network of vehicles exchanging data with each other.

Highly efficient and environmentally friendly uST transport improves the safety of high-speed transport by moving rolling stock high above the ground, which eliminates the possibility of collision with other objects and vehicles moving on the surface of the earth.



From 2015 to 2021 UST Inc. carried out the transition from the “startup” stage to the “business” stage, a number of stages were overcome from the first search solutions to the creation of a commercial product in the field of transport and infrastructure projects:

- set of research activities were carried out, 11 types of test uST’s transport and infrastructure complexes were designed and six built (five in Belarus, one in the UAE); the total length of string-rail overpasses is about 5 km. Five more complexes are under construction (three in Belarus, two in the UAE); the total length is about 8 km. Transport complexes – passenger (urban and intercity) and cargo, both in suspended and mounted versions, with flexible, semi-rigid and rigid string-rail track structures – made with spans of 40, 48, 50, 100, 144, 200, 250, 288 and 400 m;
- more than 30 buildings and structures were designed and built (passenger stations, combined with anchor supports, service workshops and depots, laboratory buildings, production shops, etc.) in Belarus and the UAE at five construction sites with a total area of more than 100 hectares;
- 22 anchor supports up to 15 m high intended for horizontal load up to 2,000 tons were designed and built, along with more than 120 intermediate supports up to 20 m high;
- 12 fundamentally different models (mounted and suspended) of rail electric vehicles on steel wheels (uPods) of the fourth generation were designed, manufactured in-house and tested, five of which are certified. Six more urban (up to 150 km/h), fast (up to 250 km/h), high-speed (up to 600 km/h) and hyper-speed (up to 1,500 km/h) models of passenger, cargo and cargo-passenger uPods are in the design and manufacturing stages;
- our own systems of automated control, communications, power supply and security of uST complexes were developed and successfully tested.

In the UAE in 2021, the uST tropical transport and infrastructure complex (uSky) was for the first time certified in accordance with international standards, including all the main structural elements:

- prestressed string-rail transport overpass;
- urban uPod (electric vehicle on steel wheels with an onboard component of the complex’s automated control system);
- anchor supports (combined with station structures, repair shop and control room);
- intermediate supports;
- passenger stations;
- service station (includes a control room and a repair workshop).

**The work performed made it possible to identify the optimal parameters of uST transport and infrastructure solutions and their tropical structural elements for subsequent commercial implementation, which began in 2021.**

**In addition, the company designed and built two high-tech demonstration and certification centers: EcoTechnoPark in Maryina Gorka (Belarus) on an area of 36 hectares; uSky Test & Certification Centre in Sharjah (UAE) on an area of 28 hectares. Head office of UST Inc. is located in Minsk (Belarus).**





**Mission of UST Inc.:**

solving the problems of the negative impact of transport and transport infrastructure on humans and the environment at the regional and global levels.

**Industry:**

transport and infrastructure support and mobility.

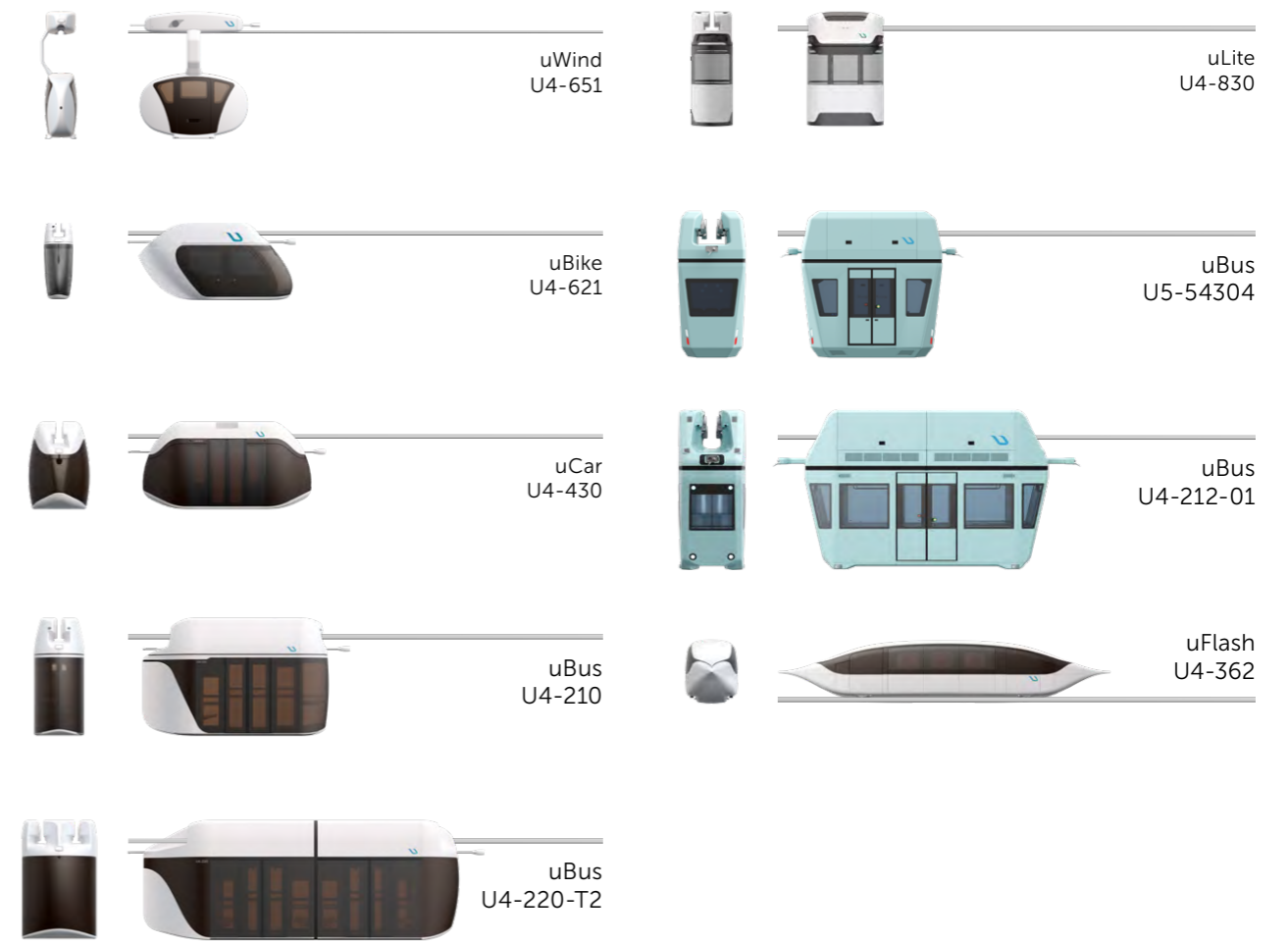
**UST Inc. product:**

uST transport and infrastructure solutions.

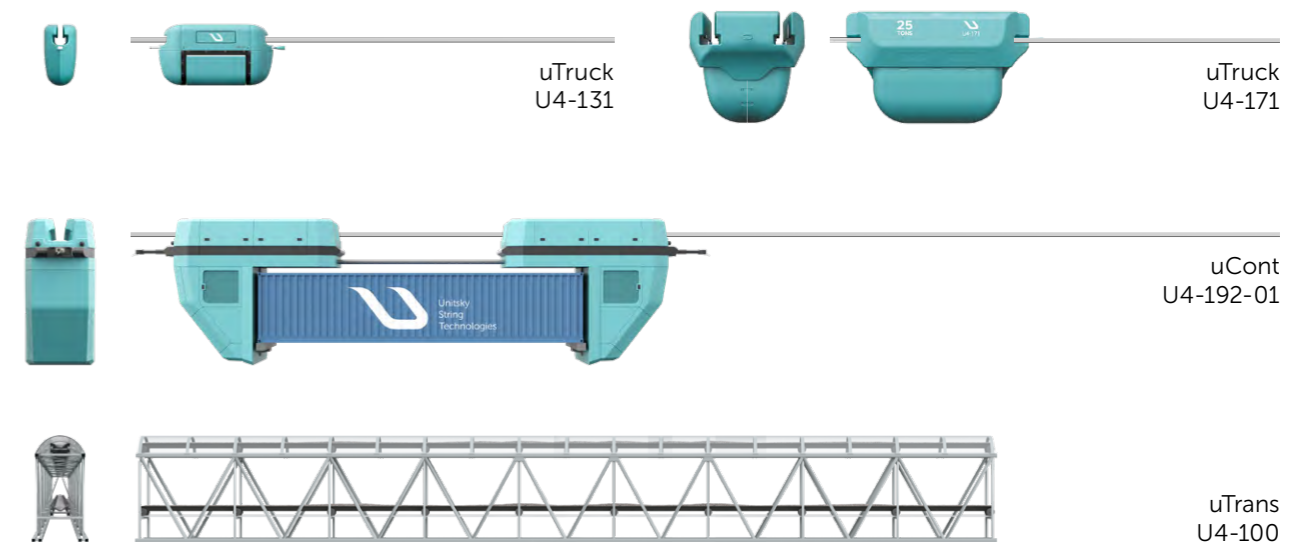
**UST Inc. product range and model range:**

set of typical (tested and certified) structural and technological solutions for the creation of uST transport complexes, allowing to perform various tasks in the field of urban and intercity passenger and cargo traffic. Depending on climate and environmental conditions of implementation and customer requests, uST transport and infrastructure complexes may have different transport and infrastructure configurations.

**Passenger uPods**



**Cargo uPods**





**Key persons of UST Inc.**



**ANATOLI UNITSKY**  
 Founder,  
 Chairman of the Board of Directors,  
 General Designer



**NADEZHDA KOSAREVA**  
 CEO

**Number of employees:**

more than 600 people, including 400 engineers and designers (as of the end of 2021).

**Established on:**

February 12, 2015.

**Contacts:**

- main office: 33 Zheleznodorozhnaya Str., Minsk, Belarus, 220089, +375 17 388 20 20, info@ust.inc;
- EcoTechnoPark R&D Center: Zorny Shlyakh Str., Maryina Gorka, Belarus, 222838;
- uSky Test & Certification Centre in Sharjah: Free Zone of Sharjah Research Technology and Innovation Park, office B-12, Sharjah, UAE;
- website: <https://ust.inc>

**Intellectual property:**

UST Inc. owns (as of the end of 2021) more than 200 international patents and 15 registered trademarks.

All work related to the design and production of uST transport and infrastructure solutions, is carried out using innovative technology platforms (for example, Dassault Systèmes, which also provides technology to major companies such as NASA, Airbus and Boeing).

# The cost of construction and operation of uST transport and infrastructure complexes

## The cost of the uST transport and infrastructure complex includes:

- ① "second level" transport and logistics infrastructure (passenger stations and train stations, loading and unloading terminals, repair shops (depot), turnouts, etc.);
- ② string-rail transport overpass (one-, two- or multi-track);
- ③ rolling stock (rail electric vehicles on steel wheels – uPods);
- ④ automated control system;
- ⑤ engineering networks and communications, power supply and communication systems;
- ⑥ design and survey works;
- ⑦ construction and installation works;
- ⑧ commissioning works;
- ⑨ certification.



## The construction cost of the uST transport and infrastructure complex can vary from \$5–7 mln/km to \$12–15 mln/km, depending on the following factors:

- purpose of the complex (passenger, cargo, cargo-passenger, urban, intercity high-speed);
- productivity of the complex (per year, per day, at peak hour);
- design speed;
- terrain (plain, rugged terrain, foothills, mountains, etc.);
- climate and environmental conditions and their features that affect the structural and technological characteristics of uST in the region of the project (for example, bearing capacity of soils, permafrost, sea shelf, jungle, desert, taiga, extreme air temperatures and wind loads, heavy snowfalls and heavy rains, sandstorms, tornadoes, floods, earthquakes, wide obstacles (gorge, river, lake, swamp), etc.);
- the length of the route, the length of the spans, the height of the supports, the height of the location of passenger stations and cargo terminals;
- the number of passenger stations, loading and unloading terminals on the route, etc.

Since these factors affect the performance indicators, the exact cost of each specific uST transport and infrastructure complex can only be determined as a result of prefeasibility studies.

## uST project implementation timing (implementation of the uST transport and infrastructure solution):

- design and survey works: 1–1.5 years;
- construction works: 1.5–2.5 years.

The design and construction of uST transport and infrastructure complexes can be carried out in parallel, if this does not contradict the law.

## Operating costs (OPEX)

Operating costs to run the uST transport and infrastructure complex depend on the following factors:

- the total number of vehicles and their capacity (carrying capacity);
- performance of the complex (per year, per day, at peak hour);
- design speed of the rolling stock on route;
- number of passenger stations, railway stations, loading and unloading terminals;
- peculiarities of the climate and environmental operation conditions of the complex (for example, the Far North, tropics, permafrost, sea shelf, mountains, jungle, desert, taiga, etc.), terrain and other natural characteristics (maximum and minimum air temperature, wind speed and wind loads, snowfalls, heavy rains, sandstorms, tornadoes, floods, earthquakes, etc.), wide obstacles (gorge, river, swamp), etc.;
- price of electricity, salaries in the region the project is implemented, etc.

Operating costs in each specific uST transport and infrastructure complex range from \$20,000 to \$100,000 per year per kilometer of the complex. The exact cost of operation can only be determined as a result of prefeasibility studies.

# Main transport and infrastructure competitors (manufacturers, cost, benefits, drawbacks)

## Monorail system

### Manufacturers:

- CRRC Corporation Ltd. (China);
- Hitachi Rail Ltd. (Japan);
- Intamin Transportation Ltd. (Switzerland);
- BYD Co. Ltd. (China);
- Korea Monorail Corporation – KMG (South Korea);
- Alstom (France);
- other.



### Construction cost

| Geographic location    | Monorail type  | Manufacturer                | Length, km | Total project cost, \$ mln | Cost, \$ mln/km |
|------------------------|----------------|-----------------------------|------------|----------------------------|-----------------|
| Projects commissioned  |                |                             |            |                            |                 |
| Kuala Lumpur, Malaysia | Urban          | Kuala Lumpur MTrans         | 8.6        | 310                        | 36              |
| Las Vegas, USA         | Urban          | Bombardier Transportation   | 6.3        | 653                        | 103.6           |
| Mumbai, India          | Urban          | Scomi Engineering Bhd       | 19.5       | 556                        | 28.5            |
| Dubai, UAE             | Urban          | Hitachi Rail Ltd.           | 5.5        | 404                        | 73.4            |
| Wuhu, China            | Urban          | Alstom                      | 30.5       | 1,250                      | 41              |
| Daegu, South Korea     | Urban          | Hitachi Rail Ltd.           | 24         | 792                        | 33              |
| Bologna, Italy         | Airport – city | Intamin Transportation Ltd. | 5.1        | 148                        | 28.9            |

The average cost of 1 km of monorail systems is \$41.3 mln

|                             |       |                   |      |       |       |
|-----------------------------|-------|-------------------|------|-------|-------|
| Projects under construction |       |                   |      |       |       |
| Cairo, Egypt                | Urban | Alstom            | 98.5 | 4,000 | 40.6  |
| Panama                      | Urban | Hitachi Rail Ltd. | 24.5 | 2,800 | 114.3 |
| Rzeszow, Poland             | Urban |                   | 16.5 | 240   | 14.5  |

### Benefits:

- no need to construct special routes along existing roads;
- supports and passenger stations take little space;
- uninterrupted operation (lack of traffic jams);
- safety (no accidents);
- low level noise;
- eco-friendliness;
- relatively low construction cost compared to underground.

### Drawbacks:

- high cost of construction compared to other types of land transport;
- visual invasion into the architecture of the city and the natural environment (supports and spans look bulky);
- high operating costs due to the uniqueness of each project and there being different types and sorts of monorail (suspended, mounted, non-contact, magnetic cushion, etc.).





## Light rail transport (LRT)

### Manufacturers:

- Siemens AG (Germany);
- Alstom (France);
- CRRC Corporation Ltd. (China);
- Hitachi Rail Ltd. (Japan);
- Hyundai Rotem Company Ltd. (South Korea);
- CAF (Spain);
- Stadler Rail AG (Switzerland);
- Pesa Bydgoszcz SA (Poland).

### Construction cost:

- Europe: \$26–33.9 mln/km;
- Asia: \$65.6–69.7 mln/km;
- North America: \$89–99.7 mln/km.



### Benefits:

- high and flexible throughput ability (3,000–30,000 pass/h);
- punctuality (isolation from traffic jams, priority movement);
- short design and construction timeframes;
- construction cost 3–5 times less than underground metro;
- high comfort (spacious rolling stock, plenty of seats, smooth acceleration and braking, boarding is often made from the platform);
- low noise level both inside and outside the rolling stock;
- eco-friendliness;
- low operating expenses.

### Drawbacks:

- high construction cost compared to traditional land transport;
- significant allocation of urban land during construction;
- infrequent stops (with frequent stops, the benefits of LRT are lost).

## Cable way

### Manufacturers:

- Doppelmayr/Garaventa Group (Austria, Switzerland);
- Pomagalski S.A. (France);
- Leitner AG (Italy);
- Bartholet Maschinenbau AG (Switzerland);
- Gimar Montaz Mautino (France);
- Conveyor & Ropeway Services Pvt. Ltd. (India).

### Construction cost

(depending on passenger and cargo traffic, height and length of spans): \$5–25 mln/km.



### Benefits:

- allocation for construction of a small amount of lands;
- speedy design and construction;
- low construction and operation costs;
- safety for passengers and road users;
- low noise level;
- eco-friendliness;
- absence of drivers.

### Drawbacks:

- low carrying capacity (up to 2,500–3,000 pass/h);
- low speed (up to 40 km/h) with minimum comfort for passengers;
- the length of the way is limited by the length of the haul cable (about 10 km), so when traveling long distances, it is required to switch from one part of the path to the next;
- low durability due to the lack of a rail track (wheels roll along bearing cables);
- insufficient anti-vandal and anti-terrorist resistance due to the vulnerability of the cables to external factors (wear, corrosion, atmospheric and mechanical effects, such as a shot from a gun, etc.);
- high energy consumption in the rolling pair "roller – cable";
- cable way in the technical sense is not a road, since its cabins are considered non-self-propelled (like elevator cabins, they aren't considered vehicles). In addition, the movement is carried out by means of one external haul cable.

## Magnetic levitation transport (maglev)

### Manufacturers:

- Transrapid International GmbH & Co. KG (its subsidiary Siemens company AG and ThyssenKrupp (Germany));
- Japan Railway Technical Research Institute and Central Japan Railway Company (Japan);
- CRRC Corporation Ltd. (China).

### The cost of a two-way levitating bed and a transport overpass

(including the cost to build trains on a magnetic cushion and the construction of passenger stations): from \$43.6 mln/km (in 2003 prices, China).



### Benefits:

- the highest speed of all types of public land transport (up to 600 km/h);
- low noise level.

### Drawbacks:

- high cost of the overpass, levitating bed, rolling stock, transport infrastructure, due to the complexity and high cost of magnetic levitation and linear electric drive;
- high travel cost and long payback period;
- significant energy consumption (for example, significantly above high-speed rail trains) due to losses in the electrodynamic suspension system, and also due to large aerodynamic losses, also due to the negative ground effect because of close proximity to the bottom of the train;
- powerful electromagnetic fields created by magnetic suspension and linear electric drives are harmful to passengers, train crews and surrounding residents (even traction transformers used on railways powered by alternate electric current are harmful to drivers). In this case, the field strength will be by an order of magnitude higher. Besides, maglev lines are harmful for the people with pacemakers.

## Personal rapid transit (PRT)

### Manufacturers:

- Ultra Global PRT (Great Britain);
- ModuTram México S.A.P.I. de C.V. (Mexico);
- Vectus Ltd. (South Korea);
- 2getthere BV (the Netherlands) (projects Masdar City (UAE), Rivium Business Park (the Netherlands), Brussels Zaventem Airport (Belgium), etc.).

### Construction cost

of the PRT infrastructure: approximately \$4.5 mln/km. Additional cost per each vehicle: \$90,000.



### Benefits:

- PRT is a transportation system that meets the following seven criteria set by Advanced Transit Association (ATRA):
- fully automatic vehicles (without drivers);
  - movement is carried out on special guideways intended exclusively for the PRT vehicles;
  - small vehicles can be used by a single passenger or a small group. The route (without accidental fellow travelers) is determined by the passengers. Transport services are available 24 hours a day;
  - special tracks can be elevated, land or underground;
  - vehicles use all special tracks and stations in a single PRT network;
  - through traffic from the departure point to the destination point (without the need for transfers or stops at intermediate stations);
  - transport services are available on demand (no fixed schedule).

### Drawbacks:

- low throughput capacity (inability to cope with increased passenger traffic at peak hour);
- low capacity of vehicles (inability to satisfy demand for the corresponding volume of passenger traffic);
- the need for a large number of vehicles (increased costs for technical service, replacement, etc.).

### Main applications:

- airports;
- tourist attractions;
- shopping parks and malls;
- university and hospital campuses;
- eco-cities;
- new urban developments;
- parks and amusement rides.

Four projects have been implemented over the past 20 years: in Rotterdam (the Netherlands, 1999); in Masdar City (Abu Dhabi, UAE, 2010); at London Heathrow Airport (UK, 2011); in Suncheon bay (South Korea, 2014). In addition, this system was built back in the 1970s (as an experiment funded by the state) on the campus of West Virginia University in Morgantown (USA).

# Marketing strategy of Unitsky String Technologies Inc.



The main commercial advantage of uST transport and infrastructure solutions is their low cost compared to competing "second level" systems. However, this value should be supplemented with other benefits of uST, which satisfy the needs of customers and users, and also correspond to modern trends in the development of the market for transport and infrastructure projects. Along with the competitive price, the most distinct benefits of string transport are its eco-friendliness (including safety for passengers), high adaptability, comfort, energy efficiency and speed of transportation. The above aspects correspond to global trends in the context of the digitalization of the economy, the transition to alternative energy sources, the fight against global warming, etc.

#### **Areas of activity:**

- passenger traffic between cities and suburbs;
- passenger traffic between cities and logistics hubs, located outside the city limits (airports, railway stations, ports, etc.);
- passenger traffic between districts of the cities, divided by water and other barriers (rivers, bays, lakes, gorges, mountains, etc.);
- passenger traffic in areas with increased requirements for eco-friendliness (parks, reserves, sanctuaries, etc.). This area may become the most promising in terms of UST Inc. occupying a separate, well-defined niche, however, it is difficult due to the need to undergo a large number of expert evaluations and all kinds of approvals;
- transport accessibility of new areas – sale of uST complexes as part of development infrastructure projects, including own urban developments (residential or industrial cluster, linear city, etc.);
- cargo transport communication in areas with difficult climatic conditions or terrain – in the absence or there being hard to build traditional land transport communications (railways and roads) between mining sites and transport hubs (railway stations, airports, ports, etc.), as well as processing plants of extracted raw materials.



**Marketing strategy of UST Inc. is built on the basis of bringing to the fore of the key consumer qualities of the product: safe, intelligent, cost-effective, eco-friendly.**



**Safe** is a zero accident rate, the absence of crowds in passenger compartments and passenger stations (due to the small size of the rolling stock) and, as a result, the minimization of virus and terrorist threats.



**Cost-effective** is a low level of resource intensity of the most expensive and material-intensive system of an overpass transport and infrastructure complex – a string-rail transport overpass. Such a characteristic allows you to significantly reduce the cost compared to other types of overpass transport (monorail, urban railway, hovercraft and magnetic levitation transport), underground and surface metro. Relatively low construction cost and low operating costs (also due to the automation of the complex) provide for establishing low fares.

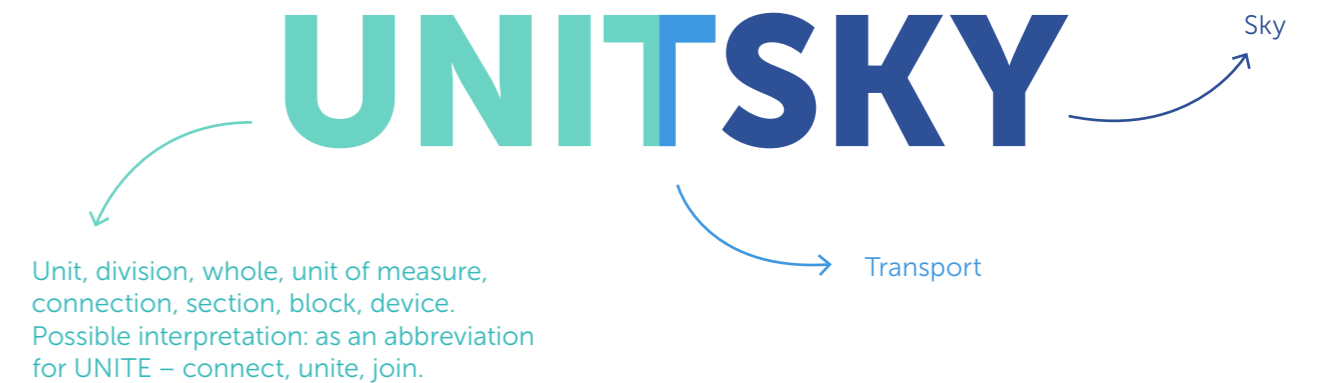


**Intelligent** is automated and adaptive, easily adaptable to any conditions in the city and outside the city, in the mountains, in areas separated by wide water barriers; carrying passengers and cargo with high speed and high productivity; in real time adjusting to the cargo and passenger traffic (rail electric cars are not crowded and not empty); exchanging digital data between all elements of the complex and with the environment; integrating various related products and technologies (power lines and fiber-optic data cables, advertising space on supports and stations, retail, residential, office and other premises built into the complex, due to which the construction cost is compensated and the payback period of the entire complex is reduced).



**Eco-friendly** is the one that takes little land; does not violate the landscape and soil fertility; is characterized by minimal carbon footprint, low noise level and insignificant impact on the natural landscape and fertile soil; does not interfere with the migration of animals and running of surface and ground waters; consumes a small amount of the most environmentally friendly energy for high-speed logistics – electricity; has a low resource intensity, including a low volume of earthworks; excludes visual intrusion into the surrounding urban and natural environment through openwork nature of the string-rail track structure, which does not even cast shadows.

**The main information message in the framework of the implementation of marketing initiatives is already embedded in the defining word of the Unitsky String Technologies Inc. company name.**



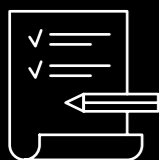
Ways to read it are "sky unit", "uniting the sky", etc. The main point is to solve the problems of the negative impact of transport on a person and the environment due to the transfer of cargo and passenger flows to a separate level – above the earth's surface, "into the sky". Unitsky can also be deciphered as "unifying" (Uni) "sky" (Sky) through "transport" (T).

**uST unique commercial offer:**

- competitive price compared to other types of overpass transport – monorail, urban railway (including tram lines on overpasses), as well as metro and cable way;
- high speed of urban transportation (up to 150 km/h) and high performance of the complexes – up to 100 mln passengers per year (up to 50,000 passengers at peak hours) and up to 100 mln tons cargo per year;
- optimal level of adaptability of uST complexes into the installation environment. Possibility to build uST transport and infrastructure communications over existing motor ways and railways, as well as in places with difficult environmental conditions and topography;
- safety – reducing the accident rate of passenger and cargo traffic to zero by raising the road above the ground, automating logistics and equipping rolling stock with effective anti-derailment system;
- eco-friendliness – the smallest areas of land allocation for the construction of uST complexes, low level of energy consumption by rail electric vehicles on steel wheels, as well as the exclusion of chemical pollution of the environment and the reduction of physical (noise, vibration, electromagnetic, visual, etc.) impact on humans and nature;
- digitalization of complexes and their integrability into the system of smart cities, including the possibility of installing power lines and fiber-optic data networks inside the uST string-rail track structure, as well as the use of public transport systems in the logic of a digital service on request (call for a vehicle through a mobile app, storage in and setting up multimedia vehicle systems to suit the user, etc.).

# Company and product naming

**UST Inc. product is not limited to one direction – it is comprehensive, covering many systems and subsystems, therefore it cannot be defined by one term.**



## **Preamble to the section: the holistic nature of the product**

On the one hand, a new transport and infrastructure industry is being created, similar to aviation, automotive or railway, in the name of which the name of a particular industry system cannot be transferred (for example, the aviation industry cannot be called "aircraft" or "airport" industry). However, the industry can be denoted by the term "complex", implying a set of systems it includes (for example, the human body is such a complex, consisting of many systems, including "communication" systems – blood circulatory, nervous, digestive. A socio-technogenic complex, which received the names "humanity" and "civilization" was then evolutionarily created from human organisms). This means that, by analogy with other industries, the new transport and infrastructure industry, considering its key feature, can be called "Unitsky String Transport (uST)".

On the other hand, it is logical to use the terms "uST transport and infrastructure solutions", "uST complex" or simply "uST" to designate the main structural elements of the new industry. Such definitions imply a set of systems, included in the industry technology, namely: "road" means a string-rail transport overpass; "rolling stock" means rail electric vehicles on steel wheels; "transport infrastructure" means passenger stations, terminals, cargo terminals, repair shops (depots), point switches, as well as engineering networks, automated control, power supply and communications systems, etc., located on the second level.

The ultimate goal (result) of creating an industry and building uST complexes is a transport service, i.e., the movement of passengers and cargo from point A to point B – safe, eco-friendly, energy efficient, comfortable, affordable (physically and financially), etc. Moreover, it is the transport service that carries all information about consumer qualities (sets goals – safety, eco-friendliness, energy efficiency, etc. – to achieve them), which the uST complex as a product should have. Therefore, the transport and infrastructure service is the ultimate product beneficiary of any uST complex.

In order for the uST product to have competitive consumer qualities, it was necessary to create (and further improve the whole life cycle of the industry technology) a multitude of uST technologies. In particular, it was necessary to develop, build and test a fundamentally new prestressed continuous and statically indefinable string-rail transport overpass, one-of-a-kind in the bridge building, monorail systems and cable ways. It was necessary to develop, build and test a fundamentally new rolling stock – rail electric vehicles on steel wheels, one-of-a-kind in either the automotive or railway industries. The above also applies to other uST systems (to the "second level" infrastructure, automated control, power supply, communications systems, etc.), including many specific engineering technologies inherent only in this industry.

These system technologies were required to be designated as uST technologies in the field of passenger and cargo transportation. However, these concepts are not equivalent to other industry-forming concepts (products) mentioned – "Unitsky String Transport", "uST", "uST transport and infrastructure solutions" – and should not be used to refer to a new industry.



## The naming concept of Unitsky String Technologies Inc. and its product

In order to unify the Russian (ЗАО «Струнные технологии») and English (Unitsky String Technologies Inc.) names of the developer company of uST transport and infrastructure solutions, it is proposed to designate it in promotion materials as Unitsky String Technologies Inc., UST Inc., UST company, UST engineering company.

uST in the English version and ЮСТ in Russian are proposed to be used as the central brand for promoting the company and its product on the market.

Therefore it is assumed:

- minimize the confusion, associated with the variety of brands used, in the perception of potential clients;
- simplify the task of promoting the brand at the current stage (in the future, nothing prevents us from creating and promoting in the Unitsky Group of Companies (UGC) framework other brands, such as, for example, uSky).

The product of the UST company is the uST transport and infrastructure solutions in the field of urban and intercity cargo and passenger transportation.

uST transport and infrastructure solutions are a set of technical and architectural elements harmonized for certain geographical conditions and logistical requirements, united as part of the uST transport and infrastructure complex.

uST transport and infrastructure complexes can have different names depending on the region of construction, tasks performed, etc. For example, a complex with a semi-rigid track structure implemented in Sharjah (UAE), equipped with two types of uPods (cargo and passenger), is called uSky. This name is also reflected in the company name – uSky Transport, which is the operator of the complex.

## The naming concept of uST vehicles

At the beginning of the vehicle name there is an element, consistent with the name of the company and its ideology. In our case, there can be four concepts.

- “Юни” in the Russian version of the name (from the English “unite” – connect, join, link and from the English “unit” – component, division, whole, unit of measure, connection, section, block, device).
- “U” in international naming option is the greatest reduction. It has many different meanings; slang for “you”. “U” is the chemical symbol for uranium. In addition, Uranus is a god personifying the sky; one of those gods who gave birth to all other gods.
- At Newtonian mechanics “U” is a symbol of the system’s potential energy. This potential energy is initially present in the uST, including in the pre-tensioned strings of the string-rail transport overpasses (it is this energy, “pumped” into strings during construction, that determines all the key characteristics of overpasses: strength, rigidity, low material consumption, etc.).
- “U” is also the origin of the mathematical symbol  $\cup$ , which represents union. It is mainly used for the Venn’s diagrams and geometry.

If the first part in the name of the vehicle denotes the union, the sky, a certain whole, then the second part indicates its mobility or some isolation. It is these two meanings that are embedded in the terms “mobile” and “pod” in Russian and international spellings, respectively.

“Mobile” in English is a movable abstract sculpture made of sheet iron and wire, a metal structure (with moving parts), a large recreational vehicle, mobile home, mobile, cell phone, portable phone, mobile phone, car phone, mobile radiotelephone, flexible (about the mind), movable, itinerant, live, changeable, changing, transportable.

“Pod” in English is a detachable cargo compartment (of a transport aircraft), a small herd (whales, walruses), a flock (birds), a shoal, a microwagon, a capsule.

Summarizing, we can say that “mobile” means mobility, movement, variability, and “pod” is isolation, restraint, singularity, etc. Therefore, the meaning is “sky unit”, “uniting the sky”, “sky device”, etc.

The difference in spelling in Russian and English is due to the fact that in English “mobile” is more associated with a mobile phone, and in Russian with a wheeled vehicle (for example, the word “automobile”). Therefore, in the Russian version, the rolling stock of the uST complexes (in its technical essence, it is a rail electric vehicle on steel wheels) must be spelled “unimobile”. In English, the unimobile should be referred to as “uPod”. The discrepancy between the wording of vehicles in Russian and English also takes place in other transport systems (for example, “самолёт” and “airplane”).

Names beginning with “U” are lowercase, as is the case with uSky. This emphasizes the modesty, mundaneness and ubiquity of vehicles, their day-to-dayness.

An additional reason for writing “uPod” is a chance to say in promotion materials that our vehicles will change the transportation market in the same way that Apple once changed the mobile phone market.

## The name of the technology, intellectual product of the company, the physical object embodied by the product, as well as the function performed by this physical object

### Name of the technology behind the product

- |                               |                                |
|-------------------------------|--------------------------------|
| • Unitsky String Technologies | • Струнные технологии Юницкого |
| • uST                         | • ЮСТ                          |

### Name of the intellectual product

- |  |  |
|--|--|
| • uST transport and infrastructure solutions | • Транспортно-инфраструктурные решения ЮСТ |
| • uST solutions                              | • Решения ЮСТ                              |
| • uST  | • ЮСТ                                      |

### Physical object embodied by the intellectual product

- |  |   |
|--|---|
| • uST transport and infrastructure complex     | • Транспортно-инфраструктурный комплекс ЮСТ |
| • Unitsky String Transport                     | • Струнный транспорт Юницкого               |
| • uST  | • ЮСТ                                       |
| • uSky Complex (option implemented in the UAE) |   |
| • uSky (option implemented in the UAE)         |   |

### Function performed by a physical object embodied by the intellectual product

- |                         |                           |
|-------------------------|---------------------------|
| • uST transport service | • Транспортная услуга ЮСТ |
| • uST                   | • ЮСТ                     |

## The name of elements of the uST transport and infrastructure complexes

uST transport and infrastructure complexes include four major elements: string-rail overpass, rolling stock (uPods), infrastructure, automated (intelligent) control system.

### Elements of the prestressed string-rail overpass

|  |  |
|--|--|
| String rail  | Струнный рельс   |
| <ul style="list-style-type: none"> <li>• Rigid string rail</li> <li>• Semi-rigid string rail</li> <li>• Flexible string rail</li> </ul>  | <ul style="list-style-type: none"> <li>• Жёсткий струнный рельс</li> <li>• Полужёсткий струнный рельс</li> <li>• Гибкий струнный рельс</li> </ul>  |
| Anchor support   | Анкерная опора   |
| <ul style="list-style-type: none"> <li>• End anchor support</li> <li>• Pass-through anchor support</li> <li>• Anchor support combined with stations (building)</li> <li>• Turn anchor support</li> </ul> | <ul style="list-style-type: none"> <li>• Концевая анкерная опора</li> <li>• Проездная анкерная опора</li> <li>• Анкерная опора, совмещённая со зданиями и сооружениями</li> <li>• Поворотная анкерная опора</li> </ul> |

|  |  |
|--|--|
| Intermediate support   | Промежуточная опора  |
| <ul style="list-style-type: none"> <li>• Intermediate support for monorail track structure</li> <li>• Intermediate support for double-rail track structure</li> <li>• Turn intermediate support</li> </ul> | <ul style="list-style-type: none"> <li>• Промежуточная опора для монорельсовой путевой структуры</li> <li>• Промежуточная опора для бирельсовой путевой структуры</li> <li>• Поворотная промежуточная опора</li> </ul> |
| Intermediate support saddle (ISS)  | Седло промежуточной опоры  |
| Variable stiffness beam  | Балка переменной жёсткости   |

### Varieties of rolling stock – uPods

|   |  |
|---|--|
| Passenger uPod  | Пассажи́рские юнимобили  |
| <ul style="list-style-type: none"> <li>• uBus</li> <li>• uCar</li> <li>• uWind</li> <li>• uBike</li> <li>• uFlash</li> <li>• uLite</li> </ul> | <ul style="list-style-type: none"> <li>• Юнибус</li> <li>• Юникар</li> <li>• Юнивинд</li> <li>• Юнибайк</li> <li>• Юнифлэш</li> <li>• Юнилайт</li> </ul> |
| Cargo uPod  | Грузовые юнимобили   |
| <ul style="list-style-type: none"> <li>• uCont</li> <li>• uTruck</li> <li>• uTrans</li> </ul>   | <ul style="list-style-type: none"> <li>• Юниконт</li> <li>• Юнитрак</li> <li>• Юнитранс</li> </ul>   |

### Elements of uST infrastructure

|   |   |
|---|---|
| Station   | Станция   |
| Terminal  | Терминал  |
| Depot   | Депо  |
| Traction substation                             | Тяговая подстанция                              |
| Turn section                                    | Поворотный участок                              |
| Turning circle                                  | Поворотный круг                                 |
| Unstressed section                              | Ненапряжённый участок                           |
| Turn-out switch                                 | Стрелочный перевод                              |
| Transborder                                     | Трансбордер                                     |
| Safety, power supply and communications systems | Системы безопасности, энергообеспечения и связи |

### Elements of an automated (intelligent) control system in the uST transport and infrastructure complex

|   |   |
|---|---|
| Motion control system   | Система обеспечения движения                              |
| Interactive system  | Интерактивная система взаимодействия с пользователем      |
| Positioning system  | Система позиционирования                                  |
| Functional equipment control system   | Система управления функциональным оборудованием           |
| Onboard automated system  | Система автоматике на борту                               |
| Technical vision  | Техническое зрение  |
| Energy supply system  | Система энергообеспечения                                 |
| Inter-vehicle communication system  | Система обмена данными между юнимобилиями                 |
| Data exchange and communication with external objects of the uST complex system | Система обмена данными с внешними объектами комплекса ЮСТ |

# Rebranding of Unitsky String Technologies Inc.

In 2020 UST Inc. completed a basic part of the research and development works on the creation of urban passenger uST transport and infrastructure complexes with all structural elements:

- string-rail overpass;
- rolling stock of various capacity;
- intelligent control system, energy supply and communications systems;
- "second level" infrastructure (stations, depots, terminals, point switches, etc.).

Therefore, the company has at its disposal the first market uST transport and infrastructure product, ready for scaling-up and use in commercial projects. In 2021, this achievement was confirmed by the certification of the uST passenger complex and its key structural elements for compliance with safety requirements, carried out by TUV SW (Certification & Standardization) at uSky Test & Certification Centre in Sharjah (UAE).

In fact, we saw a transition of UST Inc. from the «startup» stage to the «business» stage, which started the rebranding process in the end of 2019, gradually occurring over two years from 2020 to 2021.







**The change of the brand has a lot to do with the company, which develops the string transport, entering a new stage of development, at which it has at its disposal a full-fledged market product in the field of mobility. Before, the company had been at the stage of a venture project for several years, which was the basic reason for bringing the investment brand SkyWay to the forefront.**

ANATOLI UNITSKY

Founder, Chairman of the Board of Directors,  
General Designer of UST Inc.

### **Moving away from association with investment activity**

The main part of the investment channeled to develop Unitsky Group of Companies and UST Inc. engineering company (including demonstration and certification centers with test tracks in Belarus and the UAE, scientific and technological laboratories and production shops), was raised using the crowd-investing scheme. Investment was carried out through independent foreign funds, a networks of business angels and enthusiasts not affiliated with UST Inc., who worked within the framework of partner investment programs offered by the funds. This financing model has demonstrated a high level of efficiency and has made it possible to go a long way in technological development in a short time and create a highly intelligent market product. According to the founder of UST Inc. Anatoli Unitsky, this is a very rare transport and infrastructure product that engineers and scientists offer about once a century: "It is comprehensive, infrastructural, industry-forming, covering many related areas of knowledge – from logistics, transport and infrastructure to energy, communications and automated control systems."

However, crowd-investing has also led to some side effects related to the fact that in many countries there is no clear legal framework for it. It is regarded there as an investment mechanism with increased risks. In this regard, the financial regulators of some countries issued warnings about the possible danger of investing in a number of funds that used the term and trademark SkyWay (First SkyWay Invest Group Ltd.; Skyway Capital Ltd.; Sky Way Invest Group). Although such a warning does not indicate the dishonesty of the activities of the mentioned companies, however, a shadow was cast on the SkyWay brand and the interests of the string transport developer, UST Inc., were affected, which until 2020 also used the SkyWay brand in its advertising materials and in the company name in English (the Russian title did not have this brand), since SkyWay can be translated from English as "overpass" (it is the prestressed string-rail overpass that is the basic structural element of all uST string technologies, on the basis of which uST transport and infrastructure complexes are implemented).

Having carried out the rebranding, UST Inc. emphasized its legal, financial and operational detachment from former or current funds, which use the SkyWay brand. The logo and corporate identity elements were changed, the correct translation of the company name from Russian into English was made.

New logo for UST Inc. consists of two parts: a company logo and a unique graphic spelling of the company name. The logo is formed from two parts – the letter "U", which is the first letter of the name of the general designer and author of the string technologies (in English), and the outlines of the first rail electric vehicle – a uPod, created by the company and internationally called unibike U4-621 (in the new spelling – uBike U4-621).

The transition from the "startup" stage to the "business" stage and the associated refusal of the investment brand was marked by a return to a technological brand that has historical significance and refers to the name of the author of the string transport. Moreover, this is a step towards the unification of naming in Russian and English versions, since the company was called "String Technologies" in Russian before. SkyWay Technologies was used only in the English-language documents. The new brand of the company is designed to exclude the identification or confusion of third-party companies, including investment companies, with the activities of the engineering company Unitsky String Technologies Inc., established in Belarus in 2015.

