

SkyWay Transport: from Smart Transport to Smart State

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Today Russia can create the most powerful ground-based transport corridor in the world

The territory and the geographical position of Russia allow to do theoretically what cannot be done by any other country in the world — to create the most powerful ground-based transport corridor that will connect Asia, Europe and America. This possibility was hardly feasible in practice until recently, as there existed no such a transportation system that would be able to make a project of this scale feasible for the country and would rely on the economic payback in a relatively short time. However, today such technology and such transport system are already available and they work. It is Yunitskiy's string transport designed by the Belarusian company SkyWay Technologies Co. This new mode of

transportation is also known under the brand name SkyWay. SkyWay is an innovative transport system, affordable by cost (tenfold cheaper than traditional and upcoming high-speed rail systems) providing the speed of transportation of passengers and cargo at up to 500 km/h speed, and in the future, with the transition to a fore vacuum tube — up to 1250 km/h. It allows to bring up Russia to a leading place in terms of economic growth by moderate investments by Russian standards in a short period, which will be ensured by transit, exploration of remote deposits, development of a manufacturing basis to service construction of routes and other related activities. To do

this, Russia needs to build high-speed SkyWay railways with the speed of 500 km/h that would uniformly cover transit routes on Russia's territory. The basis for the intercontinental transportation Wind Rose will be the junction of two routes: "North — South" and "East — West". The first will pass on the line St.-Petersburg — Moscow — Sochi and the second one will connect Moscow with Vladivostok. Both of them can be extended: in one direction — to Beijing and Seoul and through Sakhalin to Tokyo, and in the second one — to Minsk, Paris and London.

It seems reasonable to start this project from the section "Moscow — Minsk", because the testing ground of SkyWay transport for Eurasia EcoTechnoPark is located in the brotherly Belarus near Minsk



Samples of SkyWay transport rolling stock unibus and unibike at running tests in the demonstration and certification center of the developer-Company EcoTechnoPark (Minsk region, 2017)

in the town of Maryina Gorka. A trip from capital to capital would take only half an hour on the "heavenly" route, and the project would pay back in three years even at \$30 fare, whereas it is \$100 in average on the railroad.

SkyWay transport implemented in the Republic of Belarus is for Russia not only the possibility of a sharp intensification of economic development, but it can also become a basis of modernization and reformation of cities, as well as a comprehensive development of remote areas. With the use of SkyWay systems for transportation these processes can pass in a new logic — through a gradual increase in the economic role of satellite towns with the subsequent transition to the resettlement and distribution of production facilities in the logic of linear cities, where living will meet the highest standards.

Basic features of SkyWay:

- 1) Operating speed — up to 500 km/h.
- 2) Rolling stock capacity:
 - up to 500 passengers;
 - up to 100 tons of cargo.
- 3) Track gradient — up to 10°, at special design — up to 30°.
- 4) Transportation distance — up to 10,000 km.
- 5) Volume of high-speed intercity transportation:
 - up to 1 million passengers per day;
 - up to 100 million tons of cargo per day.
- 6) Cost of a high-speed track excluding the cost of rolling stock, passenger terminals, stations and infrastructure — from 3 million USD/km.
- 7) Prime cost of high-speed transportation is 3-5 times lower than the cost of transportation by a high-speed railway and tenfold lower compared to magnetic cushion trains and aircraft.

WISE INDIA: TRANSPORTATION OF ORE, HAULAGE OF CONTAINERS AND SMART CITIES WITH THE USE OF SKYWAY TRANSPORT

India turned out to be prompt for innovations. The country is experiencing the same regional geopolitical threats that Russia is, nevertheless it is actively "moving its elbows" trying to get its place under the sun on the economic map of the world. It is just this country, not Russia, that showed the largest interest to the innovative SkyWay transport.



Another version of SkyWay rolling stock — urban articulated unibike — at the "Belarusian transport week", 2017.

In September 2017 representatives of the developer of SkyWay transport systems Skyway Technologies Co. signed three agreements with India: with the state of Maharashtra on the project for transportation of ore, with a port to create a system for transporting containers and in the framework of the development program "Smart Cities". The event took place in the framework of a large-scale Belarus-Indian business forum, where the General designer of the new technology arrived as a member of the official delegation from Belarus.

India demonstrates a serious interest to SkyWay transport. In addition to the aforementioned agreements, the developer-Company is negotiating on a large number of other projects. The interest is due to high efficiency and low cost of new transport systems. Other options available on the market (e.g. high-speed rail systems), are clearly inferior in this regard, as they would require considerable government subsidies and they would hardly pay back, because of the low level of welfare of the population. Russia has the same initial stimuli and no less than India's ambitions, however, unfortunately, it has considerably less interest to SkyWay. Up to date, only the authorities of Samara, Chelyabinsk and Ulyanovsk regions expressed the intention to introduce the technology in their areas. In addition, they are talking so far about systems of the scale much smaller than in India.

MORE DETAILS ABOUT LINEAR CITIES THAT AROUSED INTEREST IN INDIA AND ARE INTERESTING FOR RUSSIA

The concept of Smart Linear City (SLC or "smart city") was presented to India at the exhibition Smart Cities India in May 2017. It proposes the construction of a network of completely pedestrian city-clusters stretched in a line for hundreds of kilometers. A cluster with a diameter of about a kilometer is a residential, industrial, educational, commercial, sporting or combined complex of up to 10 thousand residents built in the logic of a walking distance, i.e. all the buildings are located within 500 meters from the city center. There is a dominant in the center — a high-rise building with public institutions, that houses transport, energy and information communications — SkyWay located above the ground surface, on the "second level", at a height of 10 meters and more. It also has transfer hubs for passing from urban lines (speed up to 150 km/h) to high-speed intercity elevated routes (speed up to 500 km/h) and, possibly in the future, hyper-speed routes arranged in fore-vacuum tubes (speed up to 1250 km/h). Each cluster is autonomous — it is provided with its own energy, water and food. It does not take away a single square meter of the earth from nature — the soil from under each building is displaced on a flat roof of a house, enriched with fertile humus and gets a planted garden on it.



Project of a linear city on the sea shelf

The houses are mostly single-storied, comfortable for living and affordable by cost for a family with average income. The backyard and garden on the roof will be sufficient to feed the whole family with a healthy and even healing food. Each cluster is environmentally friendly and organically fit into the environment around the entire natural diversity of India – in the mountains and forests, fields, islands, and sea shelf. All of its waste is converted into

humus (fertile soil) in special bioreactors by means of specialized microorganisms, with the addition of other balanced organic raw materials including coal, slate and peat. The network of linear smart cities covering the whole territory of India including the Himalayas and the continental shelf of the Arabian Sea and the Bay of Bengal stretching for 200 thousand kilometers (about 1/16 part of the country) will cover an area of 200 thousand square kilometers.

Over a billion people will be able to live and work there in comfortable conditions by mid-century. Ancient landscapes will be restored in the rest of the country and they will be turned into nature reserves and wildlife sanctuaries.

Such fully pedestrian linear city will have no traffic jams, smog and people will not die on the roads. Children will be able to run barefoot not on asphalt, but on the grass and the parents would not worry for their lives. The entire population will be employed mainly in the service sector including cultivation of natural food for their families. People will be healthy, full-fed and they will have a lot of free time that can be spent on creativity and self-development, since the working day would be significantly reduced. Hundreds of millions of high-paid jobs will be created here that are in need due to domestic demand for one-storeyed India.

Like the cost of elevators in high-rise buildings is included in the cost per residential square meter, a smart linear city SLC will have not vertical, but horizontal SkyWay lifts that will be included in the cost of residential and infrastructure buildings and structures. The cost per square meter of housing in such cities, built in a completely different, natural logic, will be not higher, but, on the contrary, considerably less-costly than it is in conventional cities.

SkyWay horizontal lifts will cost less by 2-3 times, than on highways, by 10-15 times compared to any elevated road – motor-roads and railways including high-speed ones, monorail, trains on a magnetic cushion. By their energy (fuel) efficiency, they are unique and better than railway transport (including tram and metro) by 2-3 times, than automobiles – by 3-5 times, than aviation and Maglev – by 5-7 times.

The need in resources for the construction, operation and maintenance (metal, concrete, asphalt, earthworks and land acquisition) will be tenfold less than for the implementation of any other transport and infrastructure solution. Such routes of the “second level” are built to operate 100 years and require almost no maintenance. They are more stable than any other traditional and promising transport system meeting natural phenomena – earthquakes, floods, tsunamis, torrential



Chairman of the Board of Directors and the General designer of the company-developer of SkyWay transport – SkyWay Technologies Co. Anatoly Yunitskiy and Dalai Lama

rains, hurricane winds, as well as vandalism and terrorist acts.

The proposed SkyWay vision of the future “Smart State” in its essence is not a transport project, but an infrastructure and development one, therefore it can be fully implemented by means of the country’s population and by creating domestic demand in all sectors of the economy – from agriculture and construction to mechanical engineering and electronics. Such a program can be gradually implemented by 2050. At the first stage, it is scheduled to begin building a test cluster of a smart linear city and test tracks of SkyWay transport systems in the state of Jharkhand in the near future. Work is in progress on the concept of the transport system for a “Smart” city in the city of Dharmasala, the state of Himachal Pradesh.

Well, what about us? Wouldn’t this logic of settlement be the most correct for Russia with its vast territory?

TECHNICAL BASIS OF SKYWAY TRANSPORT AND GROWTH PROSPECTS

Samples of freight and passenger systems are already operating today in the demonstration and certification center of SkyWay transport – SkyWay EcoTechnoPark. Passenger transport consists of a lightweight and compact unibike and spacious unibus, which can

developing and improving the new mode of transport. They have achieved amazing results in the areas specified above. For example, recent tests conducted in the wind tunnel, showed the aerodynamic drag coefficient CX for unibus close to the theoretical limit – the value of 0.06, which is 5-6 times better than in the most expensive sports cars such as Bugatti Veyron having CX=0,42 (taking into account a spoiler, without which it cannot reach high speeds). Due to perfect aerodynamics, SkyWay transport allows to save a significant amount of energy (fuel) at high-speed transportation. Other know-how developed by the Company provide for SkyWay transport the status of the most economical, efficient and safe transport system of all that were created by today.

A number of technical universities around the world are interested in SkyWay technology as a basis for introducing a new student course. Implementation of SkyWay transport actively started in India, Indonesia, Australia, UAE and other countries is spreading extremely rapidly and at a large scale putting the technology in the rank of the most rapidly developing ones. For this reason, we can expect that SkyWay transport will change the global agenda within the coming decades, as it was previously with the Internet. Russia, for which the technology can become a true salvation is unfortunately staying on the periphery of this movement. ▲



Minister of transport of the Russian Federation Maxim Sokolov receives an invitation to EcoTechnoPark