Transport should be a solution to problems, not their source. The SkyWay system provides passenger and cargo transportation in a separate space – on the ‘second level’ above the ground.

The fact that SkyWay vehicles move above the ground on a specially designed rail-string overpass ensures a number of advantages: optimized aerodynamics, increased speed, unprecedented safety, rational use of land and resources, minimized environmental damage caused by transport. In addition, the cost of construction and operation is significantly lower compared to the existing transport solutions.
ANATOLI YUNITSKI:

"THE SKYWAY TRANSPORT SYSTEM IS OPTIMAL, EFFECTIVE AND SAFE"
General designer of the innovative SkyWay technology and string transport Anatoli Yunitski is a scientist and inventor, the author of over 200 scientific papers, 18 monographs and more than 150 inventions in the spheres of construction, transport, machine-building, electronics and chemical industries.

The creator of SkyWay and geocosmic transportation systems, as well as a range of transport and infrastructure projects based on string technologies. The leader of two UN projects, the member of the USSR Federation of Cosmonautics.


SkyWay – the concept of an elevated transport system that has no analogues in the world.

Main elements of SkyWay transport and infrastructure complex:

- uncut pre-stressed rail-string overpass;
- rail automobiles on steel wheels characterized by highly aerodynamic design, equipped with an anti-derailment system and a smart system of safety, control, power supply and communications.
The development of SkyWay transport and infrastructure complexes is carried out by a team of engineers and designers of SkyWay Technologies Co. (Belarus).

SKYWAY TECHNOLOGIES CO. EMPLOYEES – A TEAM OF LIKE-MINDED PEOPLE

COMPANY STRUCTURE

- Rolling stock department
- Automated systems department
- Department for elevated and infrastructure facilities
- Project management department
- Business development department
- Special design and technological bureau with pilot production
- EcoTechnoPark
- Advanced development department
- Department for technical inspection and quality control
- Department for standardization, certification and test management
- Chief Engineer's Office
- Legal department
- 15 design bureaus (over 200 design engineers)
- Design and architecture centre
SKYWAY MANUFACTURING FACILITY

Special design and technological bureau with 'Unibus' pilot production carries out the whole range of works for SkyWay rolling stock manufacture:

- production of accessories, devices and components;
- testing of mechanical units and electronics;
- industrial prototypes testing.

The manufacturing facility serves to work out the most responsible and important technological solutions, the main SkyWay know-how.
The SkyWay systems can meet a wide range of transportation demands offering a possibility of highly efficient passenger and cargo transportation for any distances under any natural and climatic conditions.
SkyWay – speed, safety, comfort, affordability, cost effectiveness, sustainability.

SkyWay – increased social activities for people.

SkyWay – the basis for the information, power, transport and communications network of a new generation.

All types of SkyWay systems are distinguished by energy efficiency, minimal adverse environmental impact and a high safety level of passenger and cargo transportation.
URBAN TRANSPORT

Designed for short distance passenger transportation (up to 200 km).

It fits harmoniously into the existing infrastructure of any megalopolis.

It solves transport problems of large cities by developing a network of high-rise buildings connected with each other by elevated (air) transportation.
UNIBUS AND UNICAR

MODEL RANGE:

• Large class double-rail unibus
  (passenger capacity: 7–28 people;
  in articulated vehicles – up to 84–168)

• Middle class monorail unibus
  (passenger capacity: 3–14 people;
  in articulated vehicles – up to 84)

• Small class monorail unicar
  (passenger capacity: 2–6 people;
  in articulated vehicles – up to 6–18)

Maximum speed: 120–150 km/h.
Performance: up to 50,000 passengers/hour and more.
Maximum longitudinal slope of the track: 30 %.
A light and compact vehicle on steel wheels. It combines the features of a high-performance electric vehicle of the transport system and a sports and recreational facility.

In addition to the built-in (and external) power sources, the unibike is equipped with a bicycle generator so that it can be driven by the muscular force of passengers. In the future – an alternative to a car, bicycle and motorcycle.
Maximum longitudinal slope of the track: 30%.

Maximum speed: 150 km/h.

Performance: up to 20,000 passengers/hour and more.

Maximum longitudinal slope of the track: 30%.

The model range includes single-, double-, three-, four- and five-seat unibikes.
A mounted vehicle on steel wheels, designed for intercity passenger and cargo transportation for distances up to 10,000 km.
HIGH-SPEED UNIBUS

High speed is provided by the specially designed string-rail overpass and high aerodynamic efficiency of the vehicle.

Maximum speed: up to 500 km/h.
Passenger capacity: 4–24 people.
Performance: up to 500,000 passengers/day and more.
Maximum longitudinal slope of the track: up to 20%.
The cargo rolling stock is based on suspended urban passenger unibuses.

A special range of containers was developed to allow docking with maritime, railway and automobile containers for liquid, bulk, break-bulk and special cargo.

Containers for perishable goods are equipped with a thermal control system (in winter) and air conditioning (in summer); containers for environmentally hazardous goods have a multi-layer high-strength body, etc.

Speed of cargo transportation: up to 150 km/h.
Performance: up to 200 mln tonnes/year and more.
Maximum longitudinal slope of the track: up to 30 %.
Cargo SkyWay area of application:

- transportation of bulk cargo (ore, building materials, coal, etc.);
- transportation of liquid cargo (oil and oil products, natural drinking water, etc.);
- transportation of break-bulk cargo (rolled steel, wood, timber, etc.);
- transportation of containers and Europallets;
- transportation of special cargo (liquefied gases and cryogenic liquids, radioactive and explosive substances, weapons, etc.).

**UNITRANS**

The efficiency of the product pipeline is provided by 24/7 year-round continuous operation, which allows to transport large volumes of cargo.

The product pipeline includes a loading and an unloading terminal of special design – with continuous loading and unloading of goods.

It allows fast and cheap transportation of bulk and break-bulk cargo.

The system is indispensable in remote and hard-to-reach places, particularly when developing mineral deposits.

*Speed of cargo transportation: up to 36 km/h.*

*Performance: up to 200 mln tonnes/year and more.*

*Maximum longitudinal slope of the track: up to 45%.*
SKYWAY SYSTEM
SEA PORT

The advantages of using the SkyWay cargo transport system in a sea port:

• delivery of goods for the distance of 15–20 km and more from the shore without a significant cost increase;

• mooring of large vessels does not require the creation of quay walls, dredging or shore reinforcement;

• it is possible to deliver goods to a sea port located in the natural depths (up to 50 m);

• a port and the SkyWay transport system form a single logistics complex for the delivery of raw materials, operating in automatic mode;

• the transportation volume of bulk cargo – up to 200 mln tonnes/year and more;

• the type of transportation – from a mining enterprise to a bulk carrier's hold without intermediate stocking.
The time of faceless identical buildings has passed. A man needs eco-friendly architecture being a source of daily spiritual joy. The society has come to the conclusion that people should not conquer the nature, but live with it in full harmony and mutual understanding.
An Ecohouse is provided with heat, electricity and hot water using renewable energy sources – sun, ground, wind. An integrated approach when designing a building naturally uses renewable energy systems as constructive design elements.

A project considers cardinal points, a wind rose, landscape, human-friendly zoning of internal premises and overall geometry of building construction.

An original step towards the reproduction of natural balance – roof gardening – is not only a good view of the roof, but also a sky-high part of the terrestrial ecosystem. The development of "green" technologies gives the opportunity to create beautiful, multifunctional, environmentally friendly and admirable ecohouses.

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LINEAR CITY IN UNITY WITH NATURE
SkyWay tracks contribute to the development of linear cities – cluster-type urban settlements harmoniously integrated into the environment.

The ground surface is intended for pedestrians to walk and plants to grow, whereas transport, power and information communication lines are located above the ground at the "second level". The construction of linear cities will not require cutting down forests, building motor roads and railways, or disturbing biogeoecenosis in the construction zone in any similar way.

The SkyWay horizontal lifts will connect neighbouring high-rise buildings, settlements, as well as residential, commercial, entertainment, production and multifunctional clusters. The SkyWay high-speed transport arteries will take you to any point of the Earth.

SkyWay linear cities can be built in the mountains, on desert and flooded territories, including in areas with challenging terrain and on the sea shelf.
A string rail is an ordinary uncut (along its length) steel, reinforced concrete or steel-reinforced concrete beam or truss equipped with a rail head and additionally reinforced with pre-stressed (stretched) strings.

A string rail combines the features of a flexible thread (at a large span between supports) and a rigid beam (at a small span – under a rail automobile wheel and above the support).

A flat rail head and a cylindrical steel wheel provide minimal energy consumption for movement.

The power of wheel rolling resistance for a unibus of 5,000 kg at the speed of 450 km/h:

\[ W_{w.r.} = M \cdot g \cdot k_{w.r.} \cdot V = 5,000 \text{ kg} \cdot 9.81 \text{ m/s}^2 \cdot 0.0015 \cdot 125 \text{ m/s} \approx 9.2 \text{ kW}. \]

Compare:
when using pneumatic tires with \( k_{w.r.} = 0.18 \) (for \( V = 450 \text{ km/h} \))
\[ W_{w.r.} \approx 1,100 \text{ kW}. \]
TYPES OF STRING RAILS AND THE CORRESPONDING DESIGNS OF TRACK STRUCTURE

RIGID RAIL (TRUSS)

- Rigid uncut track structure
- Motion speed: from 100 to 500 km/h.
- Relative structural rigidity: 1/1,000–1/10,000.
- Track structure curve radius: $R = 5,000... 50,000$ m.

FLEXIBLE RAIL

- Flexible uncut track structure
- Motion speed: from 30 (on support) up to 150 km/h.
- Relative structural rigidity: 1/100–1/500.
- Track structure curve radius: $R = 100$ (on support)... 2,000 m.

SEMI-RIGID RAIL

- Semi-rigid uncut track structure
- Motion speed: from 50 up to 250 km/h.
- Relative structural rigidity: 1/500–1/2,000.
- Track structure curve radius: $R = 500... 5,000$ m.

It is not an analogue to cableway:

- use of rail (lower wheel rolling resistance);
- lower energy consumption for movement (by 3–5 times less);
- possibility of using a gravity engine and gravity brake (reduced energy consumption by another 3–5 times);
- high durability (by 5–7 times higher).

The SkyWay track structure design follows the design of a hanging bridge combining all its main elements.

- Hanging bridge
- Support
- Saddle
- String rail
- Tension
- String (cable)
- Saddle
- Rail body (bracing beam)
- Concrete (suspension)
- Suspension
- Bracing beam
- Cable
Δ_{max} = \frac{5qL^4}{384EI}

M_{bend} = \frac{qL^2}{8}

Δ_{max} = \frac{PL^3}{48EI}

M_{bend} = \frac{PL}{4}

A solid roadbed gives additional load on supports and has a high cost.

90% of load in a conventional overpass – its own weight. The overpass carries itself, not the useful load.
With equally distributed load, the SkyWay overpass is 5 times more rigid (smoother) and 3 times stronger than a conventional bridge.

\[
\Delta_{\text{max}} = \frac{qL^2}{384EI} \quad M_{\text{bend}} = \frac{qL^3}{12}
\]

With equally concentrated force, the SkyWay overpass is 1.9 times more rigid (smoother) and 1.5 times stronger than a conventional bridge.

The SkyWay overpass decreases the amount of building materials required for its construction compared to a conventional overpass.

As a result, the construction cost is significantly reduced.

10% of load in a SkyWay overpass – its own weight. The overpass carries the useful load, not itself in contrast to conventional bridges.
For steel, the thermal coefficient of linear expansion (per 1 °C)\n\[ a = 0.000012 \]
with \( \Delta t = 100 \) °C, \( \varepsilon = 0.0012 = \frac{1}{833} \)
(the extension will be 1.2 m per 1 km).

**Test of a rigidly restrained beam for strength and stability under thermal effect (\( \Delta t = 100 \) °C)**

- **Without tension**
  - Compressive buckling.
- **With tension**
  - The beam is not subject to compressive buckling.
Test of a rigidly restrained beam for strength and stability under thermal effect ($\Delta t = 100 \, ^\circ C$)

Test for strength:

– compression strain of longitudinal fibres:
  $$\Delta \sigma = E \cdot \varepsilon = E \cdot a \cdot \Delta t \leq \sigma_{0.2} .$$

For steel,
  with $E = 2 \cdot 10^6 \, \text{kgf/cm}^2$ and $\Delta t = 100 \, ^\circ C$:  
  $$\Delta \sigma = 2 \cdot 10^6 \cdot 0.0012 = 2400 \, \text{kgf/cm}^2 .$$

Test for stability:

– longitudinal compression force arising in a restrained beam at temperature differences:
  $$N_{\text{cmp}} = \sigma \cdot S = E \cdot a \cdot \Delta t \cdot S \leq N_{\sigma, f} = \frac{4 \pi^2 EI}{L^2} .$$

For steel,
  with $S = 100 \, \text{cm}^2$ and $\Delta t = 100 \, ^\circ C$,
  $$\Delta N = 2400 \cdot 100 = 240 \, \text{tf} .$$

With the pre-stressing force more than 240 tf, there will be no compression forces in the structure and it will not lose its stability.

Bending moment diagrams in a restrained beam (conventional design) and in a pre-stressed rigid thread (SkyWay design)

Bending moments in a rigid thread are by 10 times lower than in a conventional beam.

Conclusion

*The most dangerous phenomenon when heating a rigidly restrained beam is the loss of its stability.*

Solution

*A pre-stressed beam with the rated force of $T \geq N_{\sigma}$ ensures that even temperature difference of $\Delta t = 100 \, ^\circ C$ will not cause compression forces in longitudinal fibers of the beam.*
HIGH EVENNESS OF THE TRACK
IS ACHIEVED DUE TO USING AN UNCUT STRING RAIL BETWEEN ANCHOR SUPPORTS

- Intermediate supports installed at a span from 25 up to 100 metres (to ensure rigidity of the uncut track structure) allow to use light structures.

- Fixing of the support top to the track structure additionally increases its load-bearing capacity by 8 times.

- The amount of materials required for installation of supports can be reduced by 8 times, resulting in cost reduction by the same figure.

An uncut structure of the string rail in its overpass design reduces the amount of building materials and their cost by 15 times and more compared to a conventional beam overpass.
In terms of energy consumption, an overpass with a sagging track structure is by times more efficient than a road with a straight track structure.

The drive in the SkyWay transport system with a sagging track structure is only required to compensate for aerodynamic losses and to overcome steel wheels rolling resistance on a steel rail (about 10 kW for a 50-seat vehicle). It is explained by the fact that an engine is not used at a downhill section of the track – a vehicle is accelerated by gravity ("gravity" engine).

The unibus does not need brakes at an uphill section – it is slowed down by gravity ("gravity" brakes).

Energy recuperation takes place without using a recuperator, according to the laws of physics. The efficiency factor of this recuperation is 100 %.
SMOOTH MOVEMENT

Disadvantages:
• peak acceleration values when moving through supports;
• more complicated design of the supporting node with a temperature joint.
Uncut pre-stressed overpass (SkyWay technology)

Diagram of vertical acceleration felt by passengers during movement

Distance covered

\[ R > 100 \text{ m (flexible rail)} \]
\[ R > 1,000 \text{ m (semi-rigid rail)} \]
\[ R > 10,000 \text{ m (rigid rail)} \]

Diagram of transverse acceleration felt by passengers during movement

Passenger comfort is estimated by smooth movement \( W \):

\[
W = 2.7k \sqrt{A^2 \cdot f},
\]

where \( k \) – coefficient, which depends on direction and vibration frequency;
\( A \) – vibration amplitude, cm;
\( f \) – vibration frequency, Hz.

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Index of smooth movement, ( W )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good</td>
<td>Less than 2</td>
</tr>
<tr>
<td>Good</td>
<td>2–2.5</td>
</tr>
<tr>
<td>Satisfactory for passengers</td>
<td>2.5–3</td>
</tr>
<tr>
<td>Impermissible for passengers</td>
<td>3–3.25</td>
</tr>
<tr>
<td>Permissible for cargo</td>
<td>3.6–4.25</td>
</tr>
<tr>
<td>Unsafe for passengers from the physiological perspective</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Advantages:

• smooth change of acceleration when moving through supports;
• more simple design of the supporting node.
AERODYNAMICS OF A WHEELED VEHICLE

Wind tunnel tests of the innovative SkyWay rolling stock (unibus) in 1994–2009 gave the result $C_r = 0.075$.

This provides saving of drive power in one SkyWay vehicle of about 600 kW compared to the most advanced of alternative ground vehicles ($C_r = 0.2$).

As a result of wind tunnel tests carried out in 2017, $C_r$ of the SkyWay rolling stock was improved to 0.06: $\Delta C_r = 0.2 - 0.06 = 0.14$.

Power saving of aerodynamic resistance (at a speed of 450 km/h):

$$\Delta W_{ar} = \frac{1}{2} \rho \cdot V^3 \cdot \Delta C_r \cdot f \cdot k = \frac{1}{2} \cdot 1.25 \text{ kg/m}^3 \cdot (125 \text{ m/s})^3 \cdot 0.14 \cdot 3.2 \text{ m}^2 \cdot 1.1 \approx 600 \text{ kW}.$$
Energy (fuel) saving by one high-speed unibus for 25 years of operation will be about 22,000 tonnes, at the cost of about 20 mln USD.

Thus, a thousand unibuses with unique aerodynamic properties can save over 20 mln tonnes of fuel, at the cost of more than 20 bln USD. Along with this, 80 bln tonnes of atmospheric oxygen will be saved from burning out and more than 20 bln tonnes of polluting substances will not be generated.

The location of the track structure above the ground and the absence of a solid roadbed eliminates the main problem of high-speed transport – aerofoil effect. This alone allows to improve vehicle aerodynamics twofold.
ADVANTAGES OF SKYWAY STEEL WHEELS

Increased wheel wear and noise due to:

- big contact stresses (1,000 MPa and more) caused by a small size of the contact patch;
- slipping in the contact patch caused by a difference of seating diameters in the conical wheel surface;
- operation of brake mechanisms (brake shoes cause additional wheel thread wear);
- big static and dynamic wheel loads combined with inevitable track irregularities;
- a rigid wheel pair prone to self oscillations, which increase wear and noise;
- asymmetrical load application onto the rail head.
Advantages of SkyWay transport wheels:

- insignificant contact stress (less than 200 MPa) due to a wide contact patch (by rail head width);
- no slipping in the contact patch (cylinder rolling along the plane);
- disk brake mechanisms and ABS preventing wheels locking;
- small wheel load and absence of joints on the track;
- symmetrical rail head wear (vertically and horizontally);
- minor wheel rolling resistance due to a narrow contact patch (in the direction of wheel rolling).

Calculation of contact stress for a high-speed unibus with gross weight of 5 tonnes:

\[
\sigma_1 = 0.418 \cdot \sqrt{\frac{P \cdot E}{B \cdot q \cdot R}} = 0.418 \cdot \sqrt{\frac{1,250 \text{ kgf} \cdot 2.1 \cdot 10^5 \text{ kgf/cm}^2}{8 \text{ cm} \cdot 0.8 \cdot 26 \text{ cm}}} = 1,660 \text{ kgf/cm}^2 = 163 \text{ MPa},
\]

where
- \( P \) – wheel load;
- \( E \) – effective elastic modulus;
- \( B \) – width of wheel supporting part;
- \( R \) – wheel radius;
- \( q \) – coefficient of contact irregularity by length.
CHASSIS LAYOUT

Motor inverter
In-wheel motor
Emergency drawbar
Cooling system radiator
Accumulator battery
Voltage converter
Anti-derailment system
Suspension springs
SAFETY OF TRANSPORT SYSTEMS

High resistance to vandalism and acts of terrorism
Location of the track structure above the ground enhances traffic safety by appr. 100 times
Anti-derailment system increases traffic safety by another 10 times
AUTOMATED CONTROL SYSTEMS
OF SKYWAY TRANSPORT COMPLEX

The control system of SkyWay transport complex comprises a wide range of wireless and wired communications based on conventional information and electronic technologies.
The implementation of SkyWay complexes will increase the efficiency of transportation management, reduce overhead costs for passenger and cargo transportation and boost the development of the informational space on a global scale.
The peak traffic capacity for a bidirectional system – 720,000 passengers per day.

SkyWay performance can be additionally increased by raising modules capacity and uniting them in trains.
SKYWAY AND ECOLOGY

- No earth embankment (low-pressure dam)
- Minimal local land acquisition (reduced by 20 times)
- Preservation of natural ecosystems and geobiocenosis
- Reduced amount of hazardous emissions into the atmosphere (by times) due to less power consumption
- Increased electrical, vibro- and noise safety (by 10 times)
- Reduced resource consumption – saving of raw materials, land, power, labour and finances
As estimated by the Russian Academy of Sciences, the innovative SkyWay transport technology is the most cost-efficient, sustainable and safe of all existing and advanced transport systems.
SKYWAY COMPARED TO THE EXISTING AND ADVANCED ANALOGUES

**CAPEX**

<table>
<thead>
<tr>
<th>Environmental pollution</th>
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<td>0%</td>
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**OPEX**

<table>
<thead>
<tr>
<th>Traffic accident rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
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</table>

Maglev
Monorail
Motor transport
Railway
SkyWay string transport
The use of a linear electric motor gives the efficiency factor not more than 50% as the clearance between a rotor and a stator (e.g. in Transrapid) cannot be less than 10 mm. However, the clearance should not exceed 0.5 mm for the effective electric motor operation.

The track structure operation is more labour intensive due to its complicated configuration and technical components (electric coils, switching devices, etc.), which require constant maintenance and machinery for cleaning the track from snow and icing.

The track structure is expensive as it has a massive roadbed. The installation of electric coils and a complicated anti-derailment system is required.

Overpass cost – from 50 mln USD/km.
**High-speed SkyWay**

The track structure operation does not require any additional machinery as it is capable of self-cleaning (e.g. from snow and icing) and has no complicated technical elements (electric coils, etc.).

The SkyWay track structure is lighter and cheaper due to its elegant design. It does not require the installation of electric coils and provides a simple anti-derailment system.

Overpass cost – from 2 mln USD/km.

The use of a steel wheel gives the efficiency factor over 99.8%.
The technology of high-speed transport system developed by American billionaire Elon Musk, the founder of SpaceX and Tesla Motors, proposes the movement on an air or magnetic cushion in a vacuum tube.

SkyWay is cheaper and more effective by 10–15 times.

The technology of passenger transportation using personal vehicles operating on a magnetic cushion is developed by an Israeli company SkyTran with the support of NASA (USA).

SkyWay is cheaper and more effective by 3–5 times.
BENCH TESTS OF SKYWAY TRACK STRUCTURE

The Minutes of the visiting joint session of the Scientific and Technical Council for the Ministry of Transport of Russia, the Scientific and Technical Council for the Ministry of Communications of the Russian Federation and the interagency working group on problems of rapid off-street transport (Ozyory, Moscow region, April 12, 2002):

"...The string transport system can be considered as one of the new advanced non-conventional types of elevated transport, which previously proved its feasibility..."

"It is recommended to work out the question on the development of a test base."

"It is recommended to address the issue of project support and financing."
EcoTechnoPark is a centre for practical implementation of state-of-the-art SkyWay technologies, their international expert evaluation and certification.

The construction of EcoTechnoPark (area – 35.9 ha) is carried out near the town of Maryina Gorka (Republic of Belarus).
EcoTechnoPark aims to:

- demonstrate the working industrial prototypes of SkyWay transport and infrastructure complexes: cargo, urban and intercity high-speed;

- facilitate the certification process for every complex and their components – a transport overpass, rolling stock, infrastructure, etc.;

- contribute to the constant development and improvement of the SkyWay technology;

- demonstrate the ecological potential of the SkyWay technology – minimal footprint for the track, reduced material and power (fuel) consumption in the course of construction and operation, etc.;

- showcase the related communications infrastructure, including ecogenic bio- and agrotechnologies.
In September 2016, SkyWay participated in the largest international transport exhibition – InnoTrans'2016. It is one of the most significant events in the world of transport technologies, which determines the main development trends in this field for decades ahead. More than 2,900 exhibitors from 58 countries participated in InnoTrans'2016 with the intention to show their innovations and inventions.

The SkyWay stand included industrial designs of a unibike and a unibus, the operating model of the track structure and the security module of the SkyWay intellectual string fencing. The innovative SkyWay exposition attracted thousands of visitors every day.
The comprehensive solution to Jharkhand transport problems is estimated to cost 926 mln USD. It is planned to create about 1,000 jobs.
The potential market for SkyWay transport systems – the whole world. However at the initial stage, the focus is made on the countries and markets:

- demonstrating significant economic growth;
- whose transport infrastructure does not meet the actual needs for growth;
- that do not have their own technological base for a comprehensive solution of transport problems.

**UAE**

- In Dubai, the population grows by about 6% per year, while the number of registered cars – by 17% per year.
- Only 7% of trips is made by public transport.

**INDIA**

- Over the past 50 years, the traffic has grown by 150 times, whereas the road network – only by 9 times (since 1951).
- The quality of roads is rather poor, which leads to annual economic losses of 40–70 bln USD.

**INDONESIA**

- In Jakarta, the cost of idling in traffic jams in 2009–2010 increased from 4 bln USD to 5.2 bln USD.
- 70% of the total road network is poorly maintained, 35% – heavily damaged.
- 76% of the population lives on less than 10% of the territory.
- Without capital investments in additional infrastructure, the cost of urban congestion will increase fourfold in twenty years.

**AUSTRALIA**

- 76% of the population lives on less than 10% of the territory.
- Without capital investments in additional infrastructure, the cost of urban congestion will increase fourfold in twenty years.
PROSPECTS FOR SKYWAY TECHNOLOGY APPLICATION

- Exploration and development of underdeveloped and hard-to-reach territories, creation of a single network of cargo, urban and high-speed intercity tracks.

- Maximal reduction of capital and operating expenses for transport and infrastructure construction.

- Qualitative change in the economic structure of countries and increased GDP.

- Integration of countries into international transport corridors, creation of a fundamentally new logistics of the 21st century.

- Development of related branches for track structure and rolling stock manufacture (metallurgy, chemical, petrochemical and radio-electronic industries, machine building, construction, etc.).

All innovative SkyWay components can be manufactured at the places of project implementation using the existing technological base.
AWARDS
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