# THE TABLES PRESENT THE RESULTS OF THE WORK CARRIED OUT IN THE KEY AREAS OF uST TECHNOLOGY

**Table 1**

## STRING RAIL OVERPASS

| FACILITY | CRITERION | | | |
|---|---|---|---|---|
| | **Nomenclature of track structure types suitable for achieving the target speed characteristics of the complex** | **Total length of implemented transport complex lines of a particular type** | **Tested climatic zones of complex operation** | **Tested speed modes of complex operation (degree of achievement of target operating speed indicators)** |
| uST rapid passenger complexes (maximum speed — 150 km/h, average operating speed — 70 km/h) | • uLite lightweight overpass (rail stressing — 60 tf, uPod weight — 1.6 tons)<br>• Super-light track structure (rail stressing — 80 tf, uPod weight — 2 tons)<br>• Semi-rigid track structure (rail stressing — 240 tf, uPod weight — 6 tons)<br>• Flexible track structure (rail stressing — from 150 tf, uPod weight — 8 tons)<br>• Truss track structure (rail stressing — 240 tf, uPod weight — 17 tons)<br>• Semi-flexible heavy-duty overpass (rail stressing — 1,800 tf, maximum permissible uPod weight — up to 60 tons)*<br>• Rigid heavy-duty string rail overpass (rail stressing — up to 1,400 tf, uPod weight — 60 tons)*<br>• Rigid heavy-duty string rail overpass in tropical design (rail stressing — up to 1,800 tf, maximum permissible uPod weight — up to 60 tons)*<br>• Track switches | More than 7,000 m | • Moderate climate<br>• Tropical climate | 70–110 km/h (target indicators of operating speed have been achieved at 100%) |

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|---|---|---|---|---|
| uST cargo complexes (maximum speed — 150 km/h, average operating speed — 40 km/h) | • uLite lightweight overpass (rail stressing — 60 tf, uPod weight — 1.6 tons)<br>• Super-light track structure (rail stressing — 80 tf, uPod weight — 2 tons)<br>• Semi-rigid track structure (rail stressing — 240 tf, uPod weight — 6 tons)<br>• Flexible track structure (rail stressing — from 150 tf, uPod weight — 8 tons)<br>• Truss track structure (rail stressing — 240 tf, uPod weight — 17 tons)<br>• Semi-flexible heavy-duty overpass (rail stressing — 1,800 tf, maximum permissible uPod weight — up to 60 tons)*<br>• Rigid heavy-duty string rail overpass (rail stressing — up to 1,400 tf, uPod weight — 60 tons)*<br>• Rigid heavy-duty string rail overpass in tropical design (rail stressing — up to 1,800 tf, maximum permissible uPod weight — up to 60 tons)*<br>• Track switches | More than 7,000 m | • Moderate climate<br>• Tropical climate | 40–70 km/h (target indicators of operating speed have been achieved at 100%) |
| uST 2-in-1 cargo and passenger complexes (maximum speed — 150 km/h, average operating speed — 60 km/h) | 0 km. Truss track structure (rail stressing — 240 tf, uPod weight — 17 tons) is suitable for movement at speeds not exceeding 150 km/h | 895 m | Moderate climate | 80 km/h (target indicators of operating speed have been achieved at 100%) |

* The track is under construction. Parameters may change.

**Table 2**

## ROLLING STOCK

| FACILITY | CRITERION | | | | |
|---|---|---|---|---|---|
| | **Rolling stock model range (capacity/payload)** | **Autonomous range from the onboard energy storage (determined by customer requirements)** | **Implementation stage of the target nomenclature of rolling stock required for industry formation** | **Achieved test-mode performance of complexes (relative to target indicator)** | **Total vehicle mileage (for MTBF testing)** |
| uST rapid passenger complexes (maximum speed — 150 km/h, average operating speed — 70 km/h) | • Unified running mock-up or mule<br>• uBike (2 passengers)<br>• uWind (2 passengers)<br>• uLite (8 passengers)<br>• uCar (4 to 18 passengers)<br>• Bi-rail uBus (14 seats)<br>• Quad-rail uBus (48 seats)<br>• Karat uBus (up to 36 seats)<br>• Self-propelled chassis for testing the active systems of the automated control system | • 50 km<br>• 100 km<br>• 250 km<br>• 40 km<br>• 200 km<br>• 250 km<br>• 200 km<br>• 250 km<br>• 50 km | 100% | 100% | More than 2 mln km |

| | | | | | |
|---|---|---|---|---|---|
| uST cargo complexes (maximum speed — 150 km/h, average operating speed — 40 km/h) | • uTrans (capacity — up to 100 mln t/year)<br>• uTruck (1.7 tons)<br>• Low-capacity uCont (4.3 tons)<br>• uCont for 20- and 40-foot containers (30.5 tons), at the assembly stage<br>• BiWind | • External power supply<br>• 70 km<br>• 50 km<br>• 20 km<br>• 250 km | 80% | 50% (The system for transporting 20- and 40-foot shipping containers has not been tested) | More than 400,000 km |
| uST high-speed cargo and passenger complexes (maximum speed — 500 km/h, average operating speed — 400 km/h) | • The prototype of the traction module as part of the mock-up of the high-speed vehicle (EcoTechnoPark, Maryina Gorka). Manufactured for testing the characteristics of the load-bearing system, running gear, and power supply system from the railhead at low speeds (up to 100 km/h)<br>• The prototype of the passenger cabin as part of the mock-up of the high-speed vehicle (uSky Center, UAE). Manufactured for testing the cabin, ergonomics, boarding/disembarkation comfort, and multimedia functionality | 100 km (at 60 km/h) | 1% | 1% (6-seater vehicles with a speed of up to 150 km/h are optimal for ensuring passenger flow on lines with up to 1 million passengers per year. To accommodate 100 million passengers per year, a system with higher-capacity rolling stock and higher speeds needs to be tested) | Less than 10,000 km at speeds up to 60 km/h (MTBF testing was not conducted due to infeasibility) |

**Table 3**

## INFRASTRUCTURE AND SUPPORT SYSTEMS

| FACILITY | CRITERION | | | |
|---|---|---|---|---|
| | **Implemented prototypes of infrastructure facilities for the complexes** | **Part of the nomenclature of implemented facilities of the complex required for industry formation** | **Tested operating modes of the automated control system** | **Tested power supply systems** |
| uST rapid passenger complexes (maximum speed — 150 km/h, average operating speed — 70 km/h) | • Closed-type passenger stations<br>• Open-type passenger stations<br>• Stops<br>• Traction substations<br>• Control rooms<br>• Service and repair rooms | 100% | • Manned mode (dispatcher control)<br>• Automated mode for single vehicle operation on the line<br>• Automated mode for the operation of two or more vehicles on the line | • Power supply from the onboard energy storage<br>• Traction power supply |
| uST cargo complexes (maximum speed — 150 km/h, average operating speed — 40 km/h) | • Loading and unloading terminals<br>• Traction substations<br>• Control rooms<br>• Repair shops | 100% | • Manned mode (dispatcher control)<br>• Automated mode for single vehicle operation on the line<br>• Automated mode for the operation of two or more vehicles on the line | • Power supply from the onboard energy storage<br>• Traction power supply |

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|---|---|---|---|---|
| uST high-speed cargo and passenger complexes (maximum speed — 500 km/h, average operating speed — 400 km/h) | The open-type passenger station was used, designed for the urban suspended uST with a speed of up to 150 km/h | 1% (design, engineering (development), manufacturing (construction), state examination, testing, and certification of high-speed (500 km/h) systems should be performed):<br>1) a range of high-speed uPods (rail-powered) — passenger, cargo, mixed-use, public, and family types, both single and in train sets;<br>2) a fundamentally new electrified high-speed string rail overpass (track rigidity and smoothness — unevenness up to 5 mm over a 50 m span, including under high-speed vehicle load);<br>3) a large number of «second-level» infrastructure facilities — stations and terminals combined with anchoring structures, cargo terminals and closed-type depots, traction substations for ensuring power supply at 500 km/h, high-speed track switches, automated control systems and special communication systems, control rooms for managing the high-speed flow of uPods in complexes over 20 km in length, and others.) | Testing is completely absent (completion — 0%) | Testing is completely absent (completion — 0%) |

**Table 4**

## COMMERCIAL ACTIVITIES AND CERTIFICATION

| FACILITY | CRITERION | | | | |
|---|---|---|---|---|---|
| | **Experience in certifying complex components** | **Number of projects designed using a particular type of uST complexes** | **Number of projects using a particular type of uST complexes that will be implemented commercially in the near future** | **Number of projects using a particular type of complexes that are actively under development based on commercial agreements** | **Degree of implementation of a particular type of uST complexes as a commercial product, considering all elements, systems, and subsystems** |
| uST rapid passenger complexes (maximum speed — 150 km/h, average operating speed — 70 km/h) | • Certification of vehicles<br>• Certification of building structures (string rail overpass, buildings, and structures)<br>• Commissioning of facilities | More than 1,000 | More than 100 | More than 10 | 100% |
| uST cargo complexes (maximum speed — 150 km/h, average operating speed — 40 km/h) | • Certification of vehicles<br>• Certification of building structures (string rail overpass, buildings, and structures)<br>• Commissioning of facilities | More than 500 | More than 10 | 0 | 80% (there are no tested systems for transporting 20- and 40-foot containers) |
| uST high-speed cargo and passenger complexes (maximum speed — 500 km/h, average operating speed — 400 km/h) | No | More than 100 | 0 | 0 | Less than 1% |