

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
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GPV – GEOCOSMIC GENERAL PLANETARY VEHICLE AS A MEAN FOR THE ACHIEVEMENT  
OF THE SUSTAINABLE DEVELOPMENT GOALS

**Abstract**

The concept of sustainable development of all humanity was reflected in 17 UN goals. Its crucial aim is to prevent environmental and resource catastrophe. To restore and preserve the ecology of the planet is the key issue and basis for solving social problems. At the moment, it is not possible to stop the path of technological development of humanity, to abandon the consumption of resources and the production of goods completely, so the opposition of the technosphere and biosphere is the core problem to be solved. The uSpace program provides a solution to the problem by taking off the most harmful industries out of the planet, where unlimited energy resources and special technological conditions such as weightlessness and vacuum are provided. However, it will be possible only if there is an energy-efficient, environmentally friendly and safe transport system that will be able to provide industrial scale cargo and passenger transportation. The design of a general planetary vehicle (GPV) is proposed in an article. The GPV is a toroidal structure with a cross-section of several meters, encircling the planet in the plane of the equator and having belt flywheels in its core. Flywheels, accelerated by linear electric motors to cosmic velocities (about 10 km/s), provide the necessary lifting force due to centrifugal forces. Switching the thrust from one flywheel to another causes the GPV body to rotate around the planet, up to obtaining the first cosmic velocity in a given equatorial circular orbit. When rising every 100 km above the Earth's surface, the diameter of the GPV ring increases symmetrically in all directions relatively to the center by 1.57%, while the position of the GPV center of mass always remains unchanged and coincides with the center of mass of the planet. GPV is the only technical solution in which the transport system is capable of carrying cargo into various circular equatorial orbits without using jet engines, using only the internal forces of the system, without any energy, mechanical, chemical and other types of interaction with the environment, i.e. an extremely environmentally friendly solution for geocosmic logistics.