The Space Conveyor Could Revolutionize Space Travel *by Stanley Korn, FSPE*

The space conveyor is a mass transit system for launching vehicles into space that utilizes the energy of Earth's rotation to do the heavy lifting.

The proposed space conveyor is, in some ways, similar to the proposed space elevator (https://en.wikipedia.org/wiki/ Space elevator). A space elevator consists of a cable anchored to the ground at one end and attached at the other end to a counterweight some distance above the height of geostationary orbit, held aloft by the centrifugal force resulting from Earth's rotation. To be of practical use, the counterweight would presumably be a space station, herein referred to as the top station. Traversing the cable between the ground station and the top station is a climber capable of transporting loads between the two stations.

A major limitation of the space elevator is that the climber must make a round trip from the ground station to the top station and back before it can carry a second load to the top station. Depending on the speed of the climber, the journey is likely to take several days each way.

The space conveyor is similar to the space elevator in that it, too, consists of a ground station connected to a top station some distance above the height of geostationary orbit. However, instead of being joined by a cable, the ground station is connected to the top station by a conveyor belt moving along rollers at both stations. The accompanying images show an illustration of the space conveyor, followed by a close-up of the ground station.





Ground Station

Spaced along the conveyor belt at regular intervals are attachment sites. To attach to the conveyor belt, a conveyor car waits behind the conveyor belt for an unoccupied attachment site to approach the bottom of the conveyor belt, at which time it accelerates along a track using magnetic levitation and catches up with and hooks onto the attachment site while the latter is moving along the horizontal portion of the conveyor belt between the two rollers. The conveyor car is then carried aloft to the top station.

The components to construct a spacecraft would be carried to the top station by the conveyor cars and assembled at the top station, and the spacecraft would be released from the top of the top station.

Since there may be hundreds, if not thousands, of conveyor cars simultaneously moving up and down the conveyor belt, the carrying capacity of the space conveyor is vastly greater than that of the space elevator. Furthermore, while the space elevator must expend energy in order to lift the climber from the ground up to the height of geostationary orbit (it could coast the rest of the way upward to the top station), if the height of the space conveyor is chosen so that the force of gravity acting on the conveyor belt with the attached conveyor cars exactly balances the centrifugal force resulting from Earth's rotation, the only energy that the space conveyor would need to expend would be the small amount due to friction in the bearings supporting the rollers as well as air resistance acting on the tiny fraction of conveyor belt within Earth's atmosphere.

If the space conveyor is constructed so as to be at the height of energy-neutral operation, which turns out to be 143,905 kilometers (89,419 miles), the balance between gravity and centrifugal force would hold even if the mass of the upward moving traffic exceeds that of the downward moving traffic, as is likely to be the case for several centuries after the space conveyor begins operation, as humanity leaves Earth to explore and colonize the rest of the solar system. In that case, the energy would be provided by the energy of Earth's rotation, causing Earth to slow down. However, due to the large mass of Earth as compared to that of the conveyor cars, the resulting lengthening of the day would be so small as to be undetectable, except perhaps by the most accurate atomic clocks.

If and when the space conveyor becomes operational, it could reduce the cost of space travel to the point where it becomes affordable to the general public and becomes as common as air travel is today. Additional information and technical details regarding the space conveyor can be found in the "Space Travel" chapter of the book titled *Cutting the Gordian Knot: Simple Solutions* to Complex Societal Problems by Stanley Korn: https://www.smashwords.com/books/ view/628871.

