

# Architecture Note

## #2

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**When it achieves IOC, the Space Elevator transportation system will encounter robust & diverse on-orbit business activity.**

*Michael A. Fitzgerald*

October 2016

## Personal Prolog

This is an Architecture Note. It is the opinion of ISEC's Chief Architect. It represents an effort to document ISEC's ongoing science and engineering discussions, and is one of many to be published over time. Most importantly, it is a sincere effort to be the diary, or the chronicle, of the multitude of our technical considerations as we progress; along the pathway developing the Space Elevator.

*Michael A. Fitzgerald*

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## **When it achieves IOC, the Space Elevator transportation system will encounter robust & diverse on-orbit business activity.**

### **Future Business in Space -- Now**

ISEC has been at it for a while. Other entities and nation states have been at it for a while also; in fact, much longer than ISEC has. Over the past quarter century or more, commercial involvement in space has made its mark. Commercial space launch, commercial communications systems, and commercial imaging satellites. The other day, I saw an article about commercial weather data collection; and we have all seen the ventures offering rides into space – Space Tourism!! ISEC is certainly not expert in any of these activities.

Who are these people? Well, for starters they are our future clients, teammates, competitors, protagonists, and/or even investors. Maybe -- we better find out. Rule #80 applies: Seek to understand before you seek to be understood. We should engage; now.

### **Future Business in Space – Some future visions, as seen now.**

If you look around, one can see what will likely be on-orbit business activities when we show up. I have already mentioned the fledgling efforts for space tourism; flights to the edge of space within 5 or 10 years. We could ask the flight-for-pay guys if they would offer excursion flights from our climber or within our GEO Node Region.

The National Space Society talks of habitats in space before the end of the century <http://www.nss.org/settlement/space/> In services that are far less futuristic, Satellite fleet operator SES (<http://www.ses.com/about-ses>) says it is encouraging development of technology to enable satellite in-orbit refueling and the replacement of aging payloads. SES is in separate negotiations with MDA of Canada (<http://mdacorporation.com/>) and Orbital ATK, whose mission extension vehicle is in concept development.

The commercial communications industry is ready to invest in designing satellites for their use; born-enabled. Designed for in-orbit refueling and in-orbit payload swaps. It is said that SES is seeking to extend the life of satellites once on-orbit services are operational. It seems they want these services within 15 years!! Repairable and refuelable space communications systems are being designed now; ready to be repaired and refueled 15 years from now.

### **The business offerings of the Space Elevator – Some future vision**

The Space Elevator Enterprise – the transportation system plus – would offer a number of services; situational awareness coverage; payload repairing, refueling, transferring. and more. At the 2016 Space Elevator Convention, I spoke of services provided by small spacecraft gathered around the client's payload.

Portions of Space Elevator will be facilities – The Earth Port, the Tether, parts of both the GEO NODE Region and the APEX Anchor. Services at these facilities will need defining. Power generation, craft repair, science investigations, data processing and the like are envisioned. There is a business basis here that must be delineated. These services could be delivered by us ... or out sourced ... or owned ... or bought later. Or in a scary scenario, ignored by us now and we miss the boat then.

Further in the future (by the end of the century according to NSS); housing, recreation, safety, health, and entertainment will be needed aloft. All need a business basis to ensure that the commercial enterprise is safe, efficient, and profitable. Its contribution to the future of mankind cannot be a money losing proposition.

### **In closing**

This is a huge topic and will have great impact on our Enterprise. We cannot take our eye off the fundamental target, a revolutionary space

access transportation system .... But ... we need a plan. I will offer more thoughts next month

*Fitzer*