

Space Elevator Architecture

Architecture Note #28

Coming Attractions for 2020

(No surprises, but ...)

2019 was the “break out” year. The next few Architecture Notes will put some kindling out for 2020 ...

The Year of Space Elevator Development catches fire

Some coming attractions

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Personal Prolog

This is an Architecture Note. It is the opinion of the Chief Architect. It represents an effort to document ongoing science and engineering discussions. It 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

The notion of a Space Elevator no longer induces wisecracks about elevator music, but ...we still have a way to go.

Two things; First, I live in California so I know that the entire notion of something “catching fire” must be handled gracefully; I will do so. Second, there are several topics in the near term that must be defined within the Space Elevator Architecture discussion; and I will introduce these topics as coming attractions in this note. Over the course of the next several months, each will have their own Architecture Note. (No particular order)

- The Space Mosaic
- Space Debris Mitigation
- Transportation System Recovery
- Road Signs
- Free Delivery is an Essential ...
- Situational Self Awareness (tbs)
- Client Services as a system adjunct
- Space Elevator Test Areas
- Enterprise Business Cases
- Environment protection is a Universe thing
- Calls for Improvement
- Space Elevator Institute

An impressive list, don't you think? With mini abstracts

- **The Space Mosaic** - We are no longer just “going to space”. We will be conducting exploration, research, military operations, interplanetary travel, trade, and commercial enterprises. ISEC envisions Space Elevators servicing the Mission Operations of all of these endeavors; and special Space Elevators will be built to do the special things.
- **Space Debris Mitigation** – See Architecture Note #25. The note cites how the Space Elevator will handle the current & future issues of Debris Management. It discusses how the elevator will be protected from collisions.
- **Transportation System Recovery** – The discussion on Space Debris that maybe, just maybe, the Elevator’s tether may be severed. A recovery scheme must be developed and made part of Space Elevator at first operations.
- **Road Signs** – See Architecture Note #26. The note discusses the implementation of the ISEC call for interplanetary bus schedules; with frequent departures established as the norm. It is the ISEC position that limiting flights to Mars (for example) to the special moment every 26 months is not mission enabling.
- **Free Delivery is an essential** - See Architecture Note # 27. This note calls for focused and collaborative efforts to understand and quantify how Interplanetary missions can be successfully pursued when all mission competencies collaboratively execute the missions. Recently, ISEC has called for three particular “reference missions” that represent the essence of interplanetary space travel.
- **Situational Self Awareness** - a future Architecture Note will discuss how the Space Elevator Transportation System will keep track of all components of the architecture; from Climbers to all pieces of cargo, to objects “passing through” the Regions on high. Thousands of objects must constantly and continuously be registered and tracked!
- **Client Services Adjunct** – a coming Architecture Note will examine how the system manages entry to the Elevator and sustains an efficient flow of Climbers with cargo ascending the

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tether. Also, the Space Elevator Transportation System cannot accept a client's cargo without some assessment that it will rise to its destination without a bad outcome. Damage to the cargo is not acceptable, nor is cargo damaging the Elevator accepted.

- **Space Elevator Test Areas** – ISEC has been clear for the last six years; “show me”. The manifestation of that approach has been cited in rather succinct ways. ISEC proposes that, throughout the Engineering Validation and the Design Validation phases, extensive tests and demonstrations will be needed. Further, the next test or demonstration will be larger than the last one. Finding and building those test areas will be a challenge; let's talk.
- **Enterprise business Cases** – There are any number businesses that would like to operate within the GEO region. How might “entrance requirements” be levied for those businesses needed operational space at GEO, and operations support from the Elevator.
- **Environment protection is a Universe thing** – The one thing we learned in the 29th Century is that environment is not a extracurricular activity; it is foundational. The Space Elevator Transportation System has a great opportunity to make the Earth “greener”; it should do so!
- **Calls for Improvement** – In many ways, the development of the Space Elevator Transportation System is like any of the mega engineering projects that preceded it. The development team will learn new engineering ways and hone special engineering solutions. We will not be shy; we will “call” for such things; hence the phrase “Call for Improvement”. Improvements will enable a new tether, a bigger Climber, more throughput, or special handling special cargo; all because the Space Elevator is contributing to and building the Space Mosaic – the best way we know how.
- **Space Elevator Institute** – There is one major step that can be initiated in the near term to significantly move the Space Elevator forward. The establishment of a Space Elevator Institute would focus many of the issues for discussions, research, analysis and recommendations. The Space Elevator Institute focus will identify and study the vast array of questions still to be answered.

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The next year of Architecture Notes

These twelve topics just reveal how much engineering work and analysis awaits us. It is not to be ignored or dismissed. It is our lot; because we care so.

In Closing

I don't mean to imply that this is the list. Add to the list, if you wish. After all is said and done; a hell of a lot more is said than done; and that ain't us! Just saying.

Fitzer