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Space Elevator Transportation System

Architecture Note #23

Do you know the way to Anywhere?

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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.

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Background

Before I ran off to the Air Force, I was kind of a rocker; at least as much as my small transistor radio allowed. It was the early '60's, and most people alive these days might not have full appreciation what musical messages were delivered via that radio. I delivered newspapers and that daily chore allowed the real news to get to me as I walked slowly listening to the tinny sounds from WMLP; Milton, PA. Over my small gadget, Buddy Holly, Ritchie Valens, and the Big Bopper dying in that plane crash; first versions of Bob Dylan blowing in the wind, and Barry McGuire screaming about the Eve of Destruction. It all came through (not so) loud, yet clear.

By the late '60's, I had graduated from the Air Force Academy and was on my way to Vietnam. One song at that time was "Do you know the way to San Jose" and its simple refrain was about getting back home. This song and recollection made me ponder.

The Space Elevator lets you go anywhere

I am sitting in Los Angeles and getting to San Jose is easy; just go north on the 405 freeway and catch the 101 freeway going north. From Salt Lake City, head west to Oakland and swing south – can't miss it. But, this is a note about the Space Elevator, right? Exactly. Do you know the way from the Space Elevator Apex to anywhere?

One of the major benefits of a Space Elevator is the energy that can be used by just being released from the Apex. The Apex is moving along at a rate based on the spinning Earth - to which it is attached. Calculations show that velocity is nearly 8 kilometers per second. That speed is the galactic free ride to anywhere; except **you need to know the way.**

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I can imagine the lilting voice of Dionne Warwick ... calling out ... Do you know the way to Mars? The answer I got from a friend was YES! Every 26 months the Earth is in position to launch a rocket into a thrust efficient Hohman transfer orbit that will get you to Mars; in 8 plus months **Oh, Jeepers!!** So, if you miss the ride to Mars, you wait another 26 months? Getting home for Christmas would take on a whole new meaning! It seems like some better answers should be out there; and we should get someone to figure out some other ideas. The Mars settlers can't wait 26 months.

The way to San Jose can be as important as Anywhere.

Leaving the Space Elevator Apex to our destination has some important, supportive attributes. Everything released from the Apex has that free velocity. It is like free chips at a casino, or a \$10 coupon for a price reduction off your final bill at the store. It isn't much if you don't use it right. Our trick is to use it to get to the destination. This galactic free velocity applies to most any mass at the Apex. Big mass departures get nearly 8 kilometers per second. Small masses get the same velocity.

Our departure from the Apex needs to be effectively aimed. The highways in Space are the orbits of the heavenly bodies. To approach a destination safely & sensibly you approach it on the same plane as the destination's orbit; they call it "coplanar". Then one must understand the orbit itself. One can be coplanar with the destination but if the velocities are different ... you are in different orbits. After the space guys figure all that out ... they will need to figure out how to get into an orbit around our destination; like our moon orbits around Earth. All these steps are accomplished by velocity changes. Even changes in "direction" are accomplished with velocity and vector changes. The point of all this self-embarrassment is that the Space Elevator can put 8 kilometers per second on account. That velocity can be used to get **mass of any size** from the Apex to the destination.

But, when do we leave the Apex? Our direction changes as the APEX spins with the Earth. If I had missed that bus home for Christmas, and 26 months of waiting was in the offing --- I would take another bus elsewhere -- indeed **anywhere!** Anywhere? I have heard that before.

As long as we are getting help with planes, planar crossings, coplanar approaches, orbits, departure times, vectors, and velocities to approach our destination; we might as well ask for a list of destinations. Let's see - the Moon, Mars, several asteroids, moons around Mars, and probably more

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destinations. Sort of like an **interplanetary bus schedule**, with different information columns; velocities needed, departure times, plane changes, duration of trips, and so on.

In closing.

We are imagining the galactic ride to anywhere and everywhere.

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Space Elevator Basics

1. Space Elevator Transportation System is the 'main channel' in the Galactic Harbour.

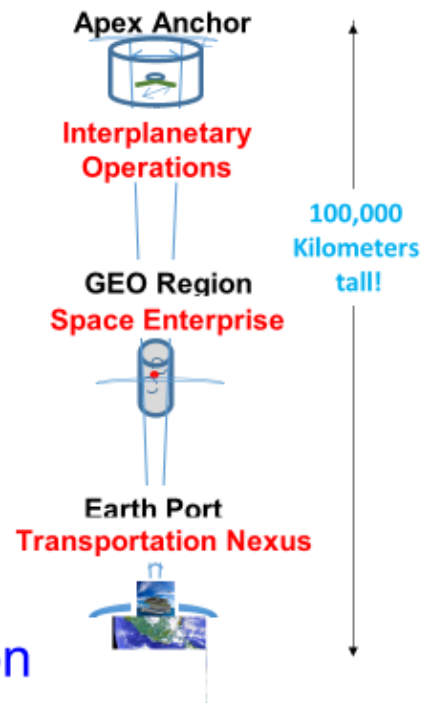
- **Apex Region**
- **GEO Region**
- **Earth Port**
- **14 Climbers**
- **2 Tethers**
- **HQ/POC**

2. Businesses flourish as part of the Space Elevator Enterprise System

- **Business support to Operational Satellites**
- **Interplanetary Efforts within reach**
- **Power and Products delivered to Earth**
- **Research**

Space Elevator Architecture

This is the transportation story of the 21st century. Reliable, safe, & efficient access to space; close at hand.



Galactic Harbour - The Unifying Vision