

*Michael A. Fitzgerald*  
*Final*

Architecture Note  
#14

Published December 2017

The Functional Delineation of the  
Galactic Harbour

*Michael A. Fitzgerald*  
December 2017

*Michael A. Fitzgerald*

*Final*

## **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*

# **The Delineation of the Galactic Harbour Space Elevator Transportation System versus Space Elevator Enterprise System**

## **Introduction**

Some system engineering functional definitions crept into our publications without a determination of whether they were Transportation or Enterprise functions. Makes them like orphans or foster children. Those definitions should go through a vetting or adoption; in brainstorming sessions or mini-workshops. During this year, newsletter readers are asked for help. ISEC is conducting the first delineation brainstorming session by e mail. Your opinions and insights are welcome, valuable, and needed! But first, some background and a discussion of the process of delineation. No worries. It is easy!!

The Galactic Harbour of mid-century and beyond will never happen unless we talk about it now. For the last two years, the attendees at the ISEC Space Elevator Conferences robustly voiced their views about the Elevator and what it should do. These new ideas and enlarged visions have been reviewed and one "trend" was evident. Every function cited was needed; in one way or another. However, little distinction was offered as to whether the function was Transportation related (functions supporting access to space) or Enterprise functions (functions supporting a business in space); at least not clearly. We need to clean this up to better know

*Michael A. Fitzgerald*

*Final*

what we are building and when. We are building the Transportation System first; then the Enterprise System; according to our Strategic Approach.

There must be expansive discussions of the essential functions of the Space Elevator Transportation System and – then- of the Space Elevator Enterprise System. For the sake of order and simplicity, all currently identified functions need to be placed in one of four stacks; 1) Transportation, 2) Enterprise, 3) both (or shared), or 4) neither (customer provided). A “vote” should be supported by a short explanation of why the assignment was made. This is not meant to be exquisite intellect or brain teasing; but rather more like fun.

Imagine you were operating a train. A customer comes with a medium sized piece of luggage. The transportation system needs to provide space for the luggage. No issues here; the luggage is customer provided and the luggage space is part of the transportation system. Now if the customer wanted to “ship” – not luggage; but rather 15 tons of liquid oxygen. The notion of luggage space for liquid oxygen now takes on a different character. Maybe the customer agrees to bring along “luggage space” for the LOX. The customer brings Climber uniquely equipped to handle such stuff. Of course, we would not want any ‘ole Climber to cling to our Tether. We have standards!! Don’t we? Delineate that!

This is not a wild circumstance. My father was a WWII veteran and, with his GI Bill; he earned a mechanical engineering degree and went to work at American Car and Foundry. One of his projects was to build “tank cars” that carried special liquids; liquid chlorine in one case and Jim Beam bourbon. Each tank car type had its own issues. In the case of the chlorine one, many safety standards were part of the demands of the Pennsylvania RR System, the AT & SF, and other transportation authorities. In the case of Jim Bean, the main issue was taxes. JB paid taxes at the point of origination so they did not want good bourbon evaporating off somewhere between Kentucky and the customers.

This process makes us come to terms with ourselves; our customers, and more. The process is called delineation. It tells us who we are; functionally. It is a very important first step along the journey to the operational Galactic Harbour.

## **The hustle and bustle of all those functions.**

Michael A. Fitzgerald

*Final*

The best production of functional descriptions is available to all at the ISEC website: [www.isec.org](http://www.isec.org). At that location find the button for “ISEC Study Reports”. After the first click find the first report; “Design Considerations of a Space Elevator Apex Anchor and GEO Node”. That report discusses the various functions of two of the three main Regions of the Galactic Harbour. Just below that first report, find a report about the Harbour’s third major Region; Design Considerations of a Space Elevator’s Earth Port. In these two document functions are cited and discussed in some reasonable detail.

Readers are asked to look through these documents and find a Galactic harbour function or two (or three) that clearly fits into one the four delineations cited earlier:

- Transportation Function
- Enterprise function
- Both Transportation & Enterprise – “Shared”
- Customer Provided – “Neither”

## **In closing**

Delineations in the Galactic Harbour is quite an undertaking. It basically asks the great question of every Galactic Harbour function; “Who are you?” Like the question from the great rock band ...” The Who”. They asked:

*Well, who are you?  
I really wanna know  
Tell me, who are you?  
‘cause I really wanna know*

Hear it: <https://www.youtube.com/watch?v=PdLlerfXuZ4>

*Fitzer*