40 – The Analog Visitor Center

SUMMARY

One project that the Network is working on would be the establishment of a new type of analogue base that would be developed rather than exploration-oriented. Located in Florida near KSC and local universities, it would benefit from local support.

OVERVIEW

The Analog Visitor Center (AVC) is a concept for a new type of analog base that would include a lunar focus and be a place that the public could visit. Unlike other analog bases, it would be intentionally located near a populated area (specifically near Kennedy Space Center) to take advantage of existing visitors, local volunteers, launch events, proximity to supplies, and proximity to universities. A set of four phases of development of the AVC is identified starting with very simple (utilizing a mock-up base we already have), to more advanced phases, and with an ultimate vision of a theme park. Starting with philanthropic funding and later having usage fees we believe that the AVC can have adequate funding throughout all of the phases. Finally, the Earth Independence Project is briefly described which would seek to figure out how a small base could produce all of its needs at a rate consistent with natural growth.

COMPARED TO OTHER ANALOG BASES

There are several analog bases, why is there a need for a new one?

Lunar Focused

The Moon is a legitimate destination in its own right. But many of the other analog bases are exclusively Mars oriented. This is a problem since the Moon will likely be developed around the same time as Mars and, given how much closer it is, it will grow much more quickly than Mars. Lunar development is a stated goal of both NASA and SpaceX and so there is a need for the Analog Visitor Center (AVC) to focus on both lunar and Martian development.

Similarly, the local resources of the Moon are fairly different than Mars. For this reason, an AVC will consider the lunar resources in a way that a Mars-only analog base probably won't.

Development and Settlement Oriented

The other analog bases are very much exploration oriented. This book describes a very large exploration phase. But, simultaneous to that, it also advocates the rapid development of a large International Lunar Base setting the stage for private settlement. For this reason, the AVC will be highly focused upon sustainable development and the processes involved with establishing humanity's first, off-Earth foothold.

Proximity to Building Materials and Supporters

The other analog bases tend to be very remote. This is great if one is exploration-oriented with a focus on the crew leaving the hab and conducting EVAs to do geology and searching for evidence of life. But if the emphasis is on increasing independence from Earth by using local resources then this is something that is mostly done indoors. For this reason, being near a Home Depot and local supporters helps to be able to develop the analog base more rapidly.

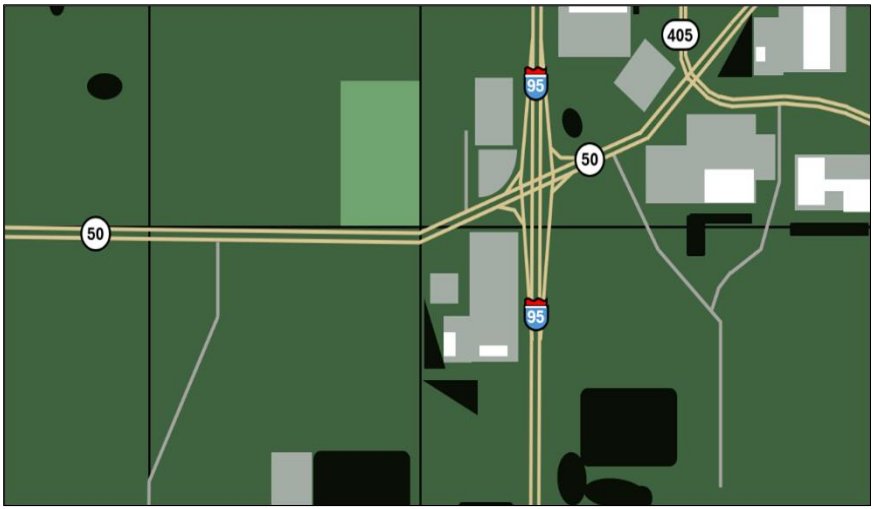
LOCATION

Several analog bases are located in very rural locations with some of them intentionally being extremely remote, even inaccessible by road. If we will be sending just a few government astronauts to repeat geologic exploration like we did during the Apollo Program, then this may make sense. But our expectation is not just government exploration but that a fleet of Starships will allow us to develop government bases even paving the way to settlement. So, a remote, Mars-like setting with just a few simulated astronauts in a small base isn't representative of what we expect with a fleet of large ships. There will be scientific exploration. But the fleet of Starships will rapidly facilitate the establishment of a large base which gets more into development and settlement.

As we look for a place that can engage the public to understand the new era that we are entering and to get excited about our settling down beyond Earth, where should this new type of analog base be located?

To answer that question, we would want to look for where there will regularly be many of the space-interested public. A couple of possibilities present themselves.

Boca Chica has seen large crowds launching test flights ("entertainment guaranteed") although those numbers have gone down significantly since the first launch. But given the very narrow flight corridor north of Cuba, Boca Chica is fine for test flights but not the best for other inclinations. So, will there be crew launched from Boca Chica thereby drawing large crowds? That seems unlikely. And many visitors are drawn locally, and south Texas is not that populated.



Rather, a more interesting location would be in Florida where the highways intersect the Space Coast near Kennedy Space Center. The Network and the Mars Foundation have examined the area and have some ideas of where the analog visitor center would ideally be located. There are some undeveloped properties that would allow the analog center plenty of room to grow into a space-themed park.

Importantly, such a campus should be highly visible to traffic meaning directly off of a major highway carrying tourists going to watch a launch. If our campus had an analog StarHab and InstaBase visible from the side of the road, it would be very attractive to tourists making last-minute decisions to visit.

PHASES OF DEVELOPMENT

We have conceived of a master plan for how the Analog Visitor Center could be developed over time. That plan is, of course, subject to change as circumstances emerge and the speed at which the different phases of development occur will largely be dependent upon funding. One could, for example, even skip to a high phase of development if sufficient funding were provided.

Phase 1 - Minimalist Level

The very first step would be to secure the use of land. It is not necessarily essential to have sufficient money to buy a property outright. Rather, a space supportive philanthropist could purchase the property, make it available for use for a period of time with a minimal lease and then treat the property as a straightforward property investment where the value increases as property prices increase.

At a bare minimum, the property needs to be cleared of brush, road access developed, and basic roadways and parking areas. Groundwork should also include the construction of a Mars yard which could host robotic rover competitions. A storage container could be used to safely store equipment when it is not being used during an event or program.

Immediately, we can conduct events on the campus using our full-scale inflatable InstaBase and Space Fair displays. People could be informed of the events via roadside banner and partnerships with space social media (e.g. YouTube) channels.

Phase 2 - Basic Level

At this level, typical analog activities can begin. A more robust, inflatable InstaBase made from vinyl could be used seasonally for analog missions. A multi-purpose building could host initial research and development work, educational events, and displays. The goal of this level would be to be open daily at a relatively low level while being well staffed with local people during prominent launches. Additionally, during this phase, the Full Self-Reliance (FSR) Project could be conducted such as an intensive Space Agriculture Session (iSAS) and ISRU demonstrations using Mars-equivalent inputs.

Phase 3 - Advanced Level

Should funding and regular staffing be secured, we can consider further growing the AVC to include one or more specialty habs that can be used by different analog teams to develop and demonstrate various

projects. An intensive summer session could, for example, demonstrate growing full nutrition. Alternately, fabricators could use a specialty hab to demonstrate the production of plastic or metal parts to demonstrate how, for example, most of the mass of a refrigerator could be produced locally while using only a small portion of the mass in the form of more complex metal parts shipped from Earth.

It is also at this level that daily tourist visits would become possible.

Phase 4 - Theme Park

Whether we make it to this level or not, it doesn't hurt to have an ultimate vision in mind. If Kennedy Space Center becomes an operational spaceport with historic, crewed missions launching to the Moon and Mars, the general public may become very interested in the future of space development. Tourists traveling between Orlando and the Cape may like to visit a facility that provides future-looking experiences in the form of a space-related theme park. For the fun of it, let's call it "Space-World". One could easily imagine opportunities to tour an analog base and watch as uniform staff demonstrate daily processes conducted at the actual bases on the Moon and Mars. Kids will, of course, love to ride in crew rovers over simulated terrain. Perhaps one could suit up, enter a dark dome with regolith floor, be connected to black tethers off-setting 5/6ths of one's weight and listen to Mission Control while having a very realistic experience of being on the Moon. It seems that it would be very easy to imagine any number of educational and entertaining experiences at SpaceWorld.

FUNDING

The AVC will start out small, requiring modest funding but, as it demonstrates interest and revenue, could grow as funding allows.

Property

It all begins with the property. If we were to be in a very rural location, we could probably arrange with the Bureau of Land Management to secure the use of land very cheaply. But near Titusville, FL, our thinking is that the more likely scenario would be that a space-interested philanthropist could secure some undeveloped property and lease it for our use on favorable terms. As property prices naturally increase over time, so would their investment.

Volunteers & Space Advocate Organization Partnerships

Local volunteers (often retirees) could help run operations when there were events thereby greatly reducing staffing expenses especially in the early years. Also, several of the large space advocate organizations do not have their own analog base. Arrangements could be made to allow these different organizations to schedule use of the facilities in exchange for budgetary funding.

Philanthropic Financing

By promoting a realistic but positive view of the future and by offering space-related educational opportunities, we believe that the AVC will appeal to certain space-interested philanthropists. It is tempting to write up a business plan and look to the profit motive to grow the AVC. Although the next two paragraphs fit within this framework, most analog bases don't use this approach but rather relied on philanthropic funding to start and utilization fees to conduct operations. We shouldn't focus only on the commercial approach while ignoring the tried-and-true avenue of philanthropic funding, especially for a project that can appeal to those sources. Philanthropists tend to want to donate to physical things that have lasting value. Fortunately, there are a lot of facilities and individual objects (e.g. telerobots, plastic-making chemistry sets, etc.) that could be funded at different levels.

Utilization Fees

As the AVC develops a setting that begins to look like an actual Moon-Mars base, it will become attractive for use by analog teams. It is customary for analog bases to largely fund their operations by charging small teams to utilize the facilities. Likewise, larger university teams conducting intensive sessions would be charged a utilization fee thereby helping the facility's budget.

Events

Events associated with schools or launches could have a fair-like setting where large crowds are milling about the campus and workers are serving the crowd. In this setting there are many opportunities to generate revenue including: entrance fees, concessions, advanced experiences (e.g. VR), and background replace photos/videos. In the ultimate vision (theme park) entrance fees would form the foundation for revenue.

Public Relations

We have identified many activities that would get positive PR exposure thereby drawing attention to the AVC and making fundraising more likely. These activities could include things such as: A timelapse video of the inflation of the InstaBase. Journalistic tours of the campus. Interviews by space YouTube channels. Reports from (launch) events. Reports of simulations and rover competitions. Etc.

THE EARTH INDEPENDENCE PROJECT

The main purpose of the AVC is to illustrate and demonstrate what a development and settlement-oriented lunar and Martian base might look like. However, an important side project would be to illustrate how a small base could potentially become increasingly or even entirely Earth independent. This means using analog resources of the Moon or Mars to produce materials needed at a growing base. By producing material (e.g. plastics or metals) and then fabricating parts (e.g. a desk made mostly out of plastic), one could help reduce shipping costs or alternatively increase the number of passengers arriving or even figure out how to become fully self-reliant.

Although not discussed in this book, the Space Development Network has developed a concept for how full self-reliance (FSR) could be demonstrated in the analog setting using only Mars-equivalent resources. This would use a first principles approach (what exactly is needed to achieve FSR?) rather than reasoning from analogy (cities on Earth survive therefore we need a city on Mars to survive). We believe that a small team could produce materials, equipment, and even habitats to grow their habitats at the rate equivalent to the natural growth rate.

GETTING INVOLVED

Would you like to play a role in helping to establish the AVC? You don't have to live anywhere near Florida to help. First, please join the Space Development Network and specify your interests. Importantly, please be proactive in this process. Choose an area that you can help and reach out to us. Space advocates of any level of knowledge, training, and skill can help move the ball forward. Thanks!