



SPACE
INFRASTRUCTURES
VENTURES

ENABLING SUSTAINABLE HUMAN PRESENCE IN SPACE – NORMALIZING SPACE

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Abstract

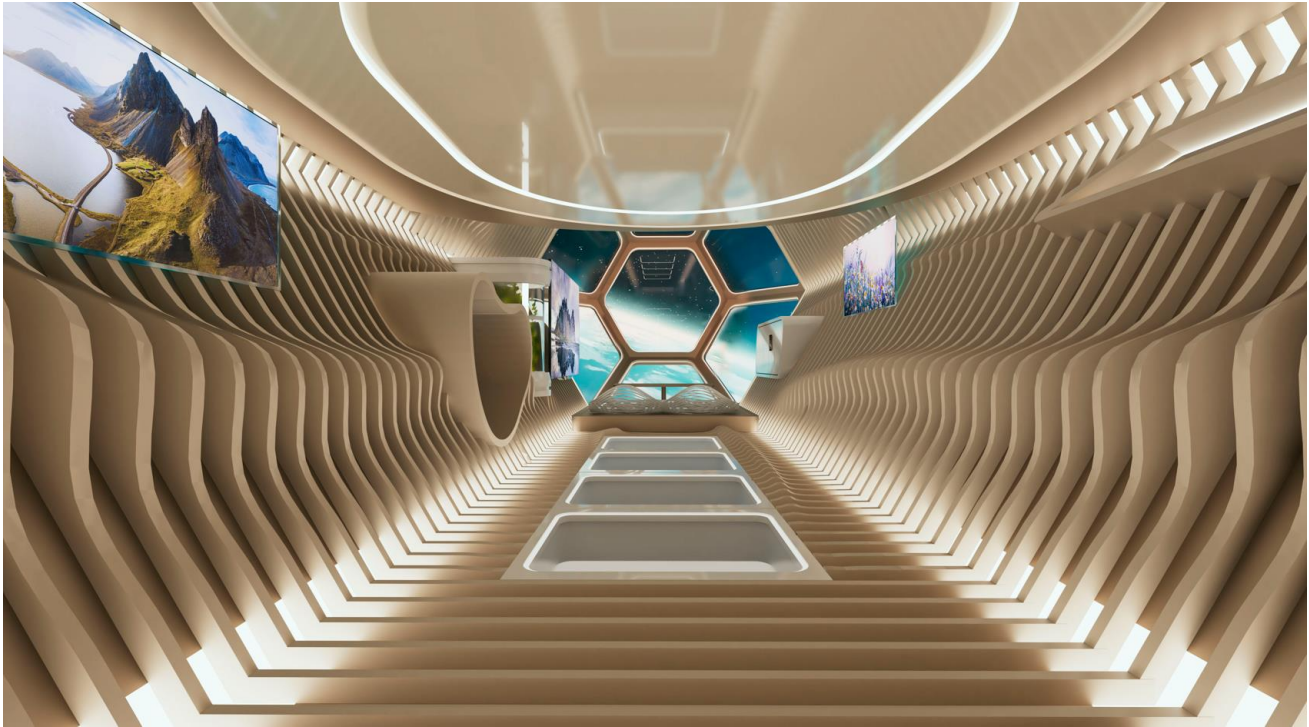
This white paper shares Space Infrastructure Ventures’ (“the Company”, or SIV in short) vision of enabling mankind to live and work in multiple space locations, thus unleashing human potential as a thriving space civilization. As a first step, the Company aims to enable a permanent and vigorous presence of humans living and working in Low Earth Orbit (LEO), as a preceding step for the colonization of cislunar space and the Moon. SIV believes that any serious attempt to unlock the unlimited space resources must start by developing a strong LEO economy, which includes habitational modules, induced gravity, and micro-gravity.

The Company is actively engaged in developing a valuable portfolio of key technologies intended to facilitate the plan to deploy a Commercial Low-Earth Orbit Destination, offering a broad range of in-orbit services. Its vertically integrated plan sets it apart from traditional space agencies, or larger government contractors, by incorporating new space initiatives such as in-orbit assembly and integration, standardization of space habitational modules, and establishment of capable space logistic infrastructures. Our vision aims to create a shipyard in space, representing a true Space Gate towards the cislunar region and beyond. SIV affiliated companies have received several grants over the last two years from NASA and the NSF for the US entity, and ESA grants for the EU entity.

The company's strategy is bolstered by several macro-economic factors that are driving the growth of the space industry. These include a significant reduction in the cost of launching payloads into space, an expanding range of commercial products that can be used in space, improvements in space infrastructure & resources, and a growing awareness of pollution and climate change issues on Earth. In addition to these broader trends, the company is benefiting from the increasing momentum of long-term investments in space settlements, a new iterative mindset in the space industry, and a willingness to take bold risks. All of these factors are contributing to the company's success in the rapidly evolving space sector. However, SIV recognizes two main barriers that need to be addressed to getting its vision widely implemented: enabling technologies maturity and large funding availability.

The benefits that await us as direct or incidental byproducts of such vigorous habitation of humans in the LEO and cislunar regions include helping Earth’s environmental challenges (more efficient use of water, food and energy), faster transition to the new economy (including education and training), catalyzation for dual use of the space technologies, as well as advances in architectural design, alternative fuel production, and low-gravity manufacturing to name but a few.

The focus of this paper is on the company's approach and its belief in the development of a strong LEO and space economy as the key to success, setting it apart from other ventures. As an entrepreneurial company with a proven track record of successful projects and grants, the company's agility and innovative spirit are expected to give it an edge over larger government contractors who may face challenges in the rapidly evolving space industry.



“We have lingered long enough on the shores of the cosmic ocean.

We are ready at last to set sail for the stars.”

Carl Sagan

Executive Summary

This paper outlines our company's vision to enable human colonization of Low Earth Orbit (LEO) and beyond, with the goal of establishing a permanent human presence in space. Our company is focused on developing a strong LEO economy as a first step towards promoting human populations in the cislunar and Moon regions. Developing a strong LEO economy and promoting humans living and working in space are crucial steps towards unlocking essentially unlimited resources of the Solar System. Our company is committed to enabling this vision and is actively working towards developing the necessary technologies and partnerships to make it a reality.

The space industry has been growing rapidly in recent years, with an increasing number of countries and private companies becoming involved in space activities. This growth has been driven by various factors, including decreasing launch costs, commercialization of space and LEO, commercial services, and infrastructure, In Situ Resources Utilization (ISRU), and space resources advancements. However, there are also various challenges that need to be addressed to ensure the sustainable development of the space economy.

Enablers of the Space Economy

Decreasing launch costs have been a significant enabler of the space economy, as it has made it more affordable to access space and has opened new opportunities for space exploration and development. Commercialization of space and LEO has also played a significant role in the growth of the space economy, enabling the development of new space services and infrastructure that can support a wide range of commercial activities. Additionally, ISRU and space resources advancements have the potential to unlock vast resources in space that can support the growth of the space economy while providing high value products for people on Earth. Finally, there is increasing momentum for space settlements, as more people become interested in living and working in space.

Challenges of the Space Economy

Despite these many economic enablers, there are also various challenges to be addressed to ensure the sustainable development of the space economy. We recognize that enabling technologies maturity and large funding availability are two main barriers; and they are connected. Continued investment in space technology and innovation is essential to support the growth of the space economy.

Another important challenge is the need for effective space governance and regulation to ensure responsible behavior in space. Additionally, there is a need for sustainable and resilient space habitats and life support systems that can support long-term human presence in space. Moreover, the management of potential health risks associated with long-term spaceflight is a significant challenge.

The Commercial Space Stations Initiative

We believe that a strong LEO economy, with a large human population living and working there, is crucial to unlocking unlimited space resources. To achieve our vision of enabling human colonization of LEO and beyond, our company has taken inspiration from the Commercial Low-Earth Orbit Destinations

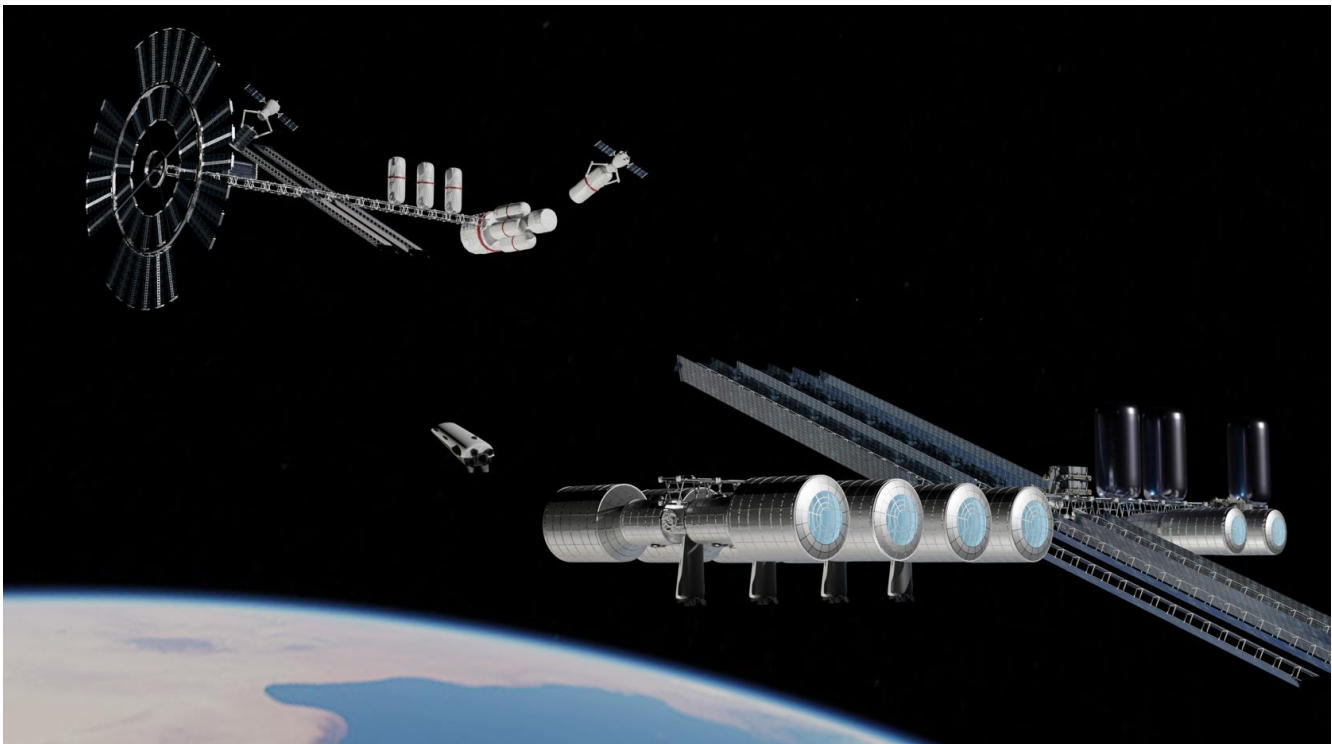
(CLD) initiative funded by NASA. This initiative aims to encourage the development of commercial destinations in LEO to promote space commerce and stimulate demand for Low-Earth Orbit spaceflight.

The CLDs aims to support the development of a Low-Earth Orbit economy by providing opportunities for commercial entities to conduct research and development in microgravity environments, offer in-space services and products, and develop and test new technologies for space exploration.

Our company is promoting the concept of Orbital Outpost One (OO1), an answer to the challenge of capable and profitable CLDs. In addition, SIV companies are actively involved in developing a portfolio of key technologies to facilitate the deployment of a Commercial Low-Earth Orbit Destination that offers a broad array of in-orbit services.

Our CLD Proposed Solution

Our design concept for a Commercial LEO Destination is purposely kept simple, based on the addition of many identical constituent blocks and modules. The envisioned gradual steps in building up this LEO commercial station will end up in a capable set of LEO platforms able to deliver a rich portfolio of in-space services. A render of the envisioned Orbital Outpost One CLD is presented below:



One of the first big steps in the SIV roadmap, is to enable a large CLD, located in an approximate 500 kilometers orbit, where a population of up to 100 humans can be accommodated to live and work by 2035. Eventually a network of these CLDs can be developed, witnessing a growing population of humans in these outposts that will become gateways and way stations to other space destinations.



SIV strongly believes that a vertically integrated plan that takes advantage of new space initiatives such as 3D printing, in-orbit assembly, and standardization of space modules can offer a more cost-effective and efficient solution for space exploration and development. Our goal is to reduce the cost and complexity of space missions while increasing efficiency and speed of execution.

This new CLD approach can succeed based on several factors such as low cost, innovation, and building synergies in the industry.

Firstly, by focusing on low-cost scalable solutions and leveraging the latest technologies and innovations in the space and other industries, our company can provide a more cost-effective alternative to traditional space agencies and larger government contractors. This can make space-based activities more accessible to a wider range of stakeholders, including private companies and startups, leading to the development of a more diverse and sustainable space economy.

Secondly, building components with a strong commercial value and high potential market on Earth. This results in earlier revenues, additional revenue streams, and strong exit strategies for early investors in our various focused companies.

Thirdly, unsurpassed scalability of our platform which starts as a small robotic station and expands into a large station for up to 100 people, including a scalable platform as infrastructure for on-orbit servicing, assembly, and manufacturing, responding to market demands and investor interest.

Next, by fostering an entrepreneurial and innovative culture within the company, the team can stay agile and responsive to the rapidly evolving needs of the space industry. This will enable us to quickly adapt to new challenges and opportunities and stay ahead of the competition.

Furthermore, by building strong synergies and partnerships within the industry, the company can tap into the expertise and resources of other players in the space ecosystem. This can help to accelerate the development of new technologies and services and create a more collaborative and supportive environment for the entire space industry. Building strategic partnerships with other companies and organizations in the space industry will enable us to achieve greater innovation and cost-efficiency.

An additional aspect to consider is our dual domicile in the US and Europe, which allows for strong synergies between the two regions. The US and Europe are home to many of the world's leading space agencies and companies, and SIV's presence in both regions enables it to access a wide range of expertise, resources, markets, and opportunities. This dual domicile enables us to take advantage of the strengths of each region at all possible levels (talent, grants, support).

This approach will enable our company to develop a strong presence in the growing LEO and later cislunar economies and succeed in developing a sustainable and vibrant space company that benefits stakeholders across the globe.

Table of Contents

Abstract.....	1
Executive Summary.....	3
1. Purpose and Scope.....	7
2. Brief Overview of the Company's Vision & Goals.....	7
3. The Importance of Developing a Strong LEO Economy	8
4. Our Company's Role in Enabling Human Colonization of LEO	9
5. The Broad Array of In-Orbit Services We Offer, & the Industries that Can Benefit.	11
6. Addressing the Barriers to Human Colonization of LEO: Funding and Regulations	12
7. Competitive Landscape for the Commercial LEO Destinations (CLDs).....	14
8. Why We Are a Unique Proposition for CLDs	15
9. Conclusion	18



1. Purpose and Scope

The purpose of this paper is to outline our company's vision to unleash human potential through a thriving space civilization in LEO and beyond. We will discuss the advantages of expanding mankind in LEO and beyond, the key components of a strong LEO economy, the company's strategies, the plans to help make this vision a reality, and the role our company will play.

2. Brief Overview of the Company's Vision & Goals

SIV was founded in summer 2021, to enable humans to live and work in multiple space locations, with the goal of establishing a permanent human presence in space. A strong LEO economy will first be the bridge from Earth to enable unlocking unlimited space resources, provide a foundation for continued space exploration and colonization, and catalyzes economic growth and innovation on Earth.

This includes identifying key components of a strong LEO economy, such as transportation, infrastructure, habitation modules, and communication systems. The company also plans to leverage its expertise in space technology and engineering to develop and commercialize new products and services that support the growth of the LEO economy. We plan to partner with other organizations and governments to advance the goal of human colonization of space.

SIV aims to establish itself as a leader in the field of space exploration and colonization, and to help pave the way for a sustainable human presence in space. We believe that humans can thrive in multiple space locations, and we believe that our company can play a significant role in advancing human civilization's presence in the cosmos.

We recognize that the journey to establishing a permanent human presence in space will be a long one, but we are committed to working towards this goal with diligence and unwavering dedication. We firmly believe that the future of human civilization is intertwined with the exploration and colonization of space, and we are committed to playing our part in making this a reality.

3. The Importance of Developing a Strong LEO Economy

There are several advantages to Commercial LEO Destinations (CLDs), including the ability to conduct scientific research in a microgravity environment, the potential for space tourism, and the development of new industries such as space manufacturing. Furthermore, a strong LEO economy can lead to unlocking unlimited space resources including the extraction of valuable resources from the Moon, asteroids, and other celestial bodies, which could be used to support space exploration and development, and to alleviate the Earth resources intensive extraction processes, thus helping to solve the climate issues on Earth.

One critical resource that could be unlocked through a strong LEO economy is water. Water is a critical resource for human space exploration and colonization, as it can be used for life support, fuel production, and radiation shielding. As an example, an electrolyzer can produce pressurized oxygen and hydrogen from water, essential resources for human life support and rocket propulsion.

Another resource that could be unlocked through a strong LEO economy is rare earth metals. These metals are essential to produce many high-tech products, including electronics, batteries, and renewable energy technologies. Currently, China dominates the global market for rare Earth metals, leading to concerns about supply chain vulnerabilities and price volatility. The development of space-based resource extraction technologies could provide an alternative source of these critical materials, reducing reliance on Earth-based resources and improving supply chain resilience.

It is essential to build more public-private partnerships (PPPs) to enable the development of a strong LEO economy. The development of policies and licensing regimes that create a predictable and stable business environment for private companies to invest in space infrastructure and services is crucial. This will facilitate international cooperation and coordination in space activities. The Economic Development Goals (EDGs) of the United Nations are designed to promote sustainable economic growth, create new jobs, and reduce poverty around the world. CLDs can contribute to these goals by providing new opportunities for economic development (like space tourism, research in microgravity environments, and manufacturing of new materials, pharmaceuticals, and other products), intense job creation (engineering, science, and technology), and help to succeed with environmental and sustainability challenges on Earth, such as reducing carbon emissions or improving energy efficiency.

Overall, the development of a sustainable LEO economy could offer many opportunities for economic growth, job creation, scientific research, and innovation. These opportunities could be particularly important for developing countries looking to participate in the global economy and achieve their own economic development goals. Developing an unassailable LEO economy will require stable regulatory frameworks that can support commercial activities in space.

4. Our Company's Role in Enabling Human Colonization of LEO

Developing an unassailable LEO economy requires the development of infrastructure, such as space habitats and transportation systems, the development of advanced technologies for resource utilization and management, and the establishment of a human population in LEO. This would require the creation of a market for in-orbit services and the development of a sustainable ecosystem that can support the needs of the population.

Our company's approach to developing a rich and diversified LEO economy with major human participation involves a phased strategy that leverages a valuable portfolio of component technologies some existing in our partners and allies, and some under development.

The first phase focuses on the deployment of a purely robotic Commercial Low-Earth Destination platform (OO1) that offers an array of in-orbit robotic services, facilitated by the development of advanced orbital tugs, infrastructure components, robotic elements, and a suite of pressurized tankers and modules. This destination will provide fueling, fuel depot stages, 3rd party payloads hosting, and docking and stowage services. OO1 can scale up to become a "Shipyard in Space", based on in-space assembly and integration for large space systems as long as their constituent modules support the basic interfaces that will be defined in our Users Interface Guide.

A render of this Robotic Platform, as the first element of the envisioned Orbital Outpost One - OO1 CLD is presented below:

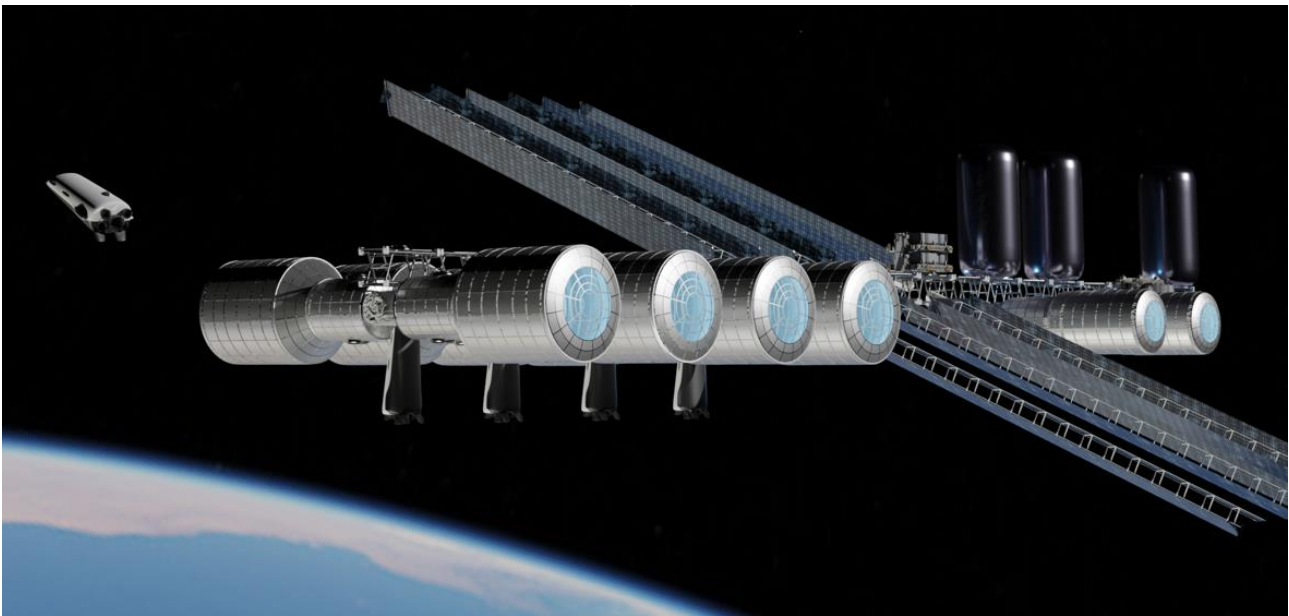


We plan to continue with a second human rated platform, in close orbital proximity to the robotic one, with multiple crewed micro-gravity platforms featuring habitats and research facilities. The crewed

station will serve as a hub for secure R&D and manufacturing facilities, training, tourism, and third-party privately-owned modules.

Our company is actively engaged in developing a valuable portfolio of key technologies intended to facilitate the plan to deploy such a crewed Commercial Low-Earth Destination, including 3D printed shells for tankers and pressurized modules, advanced design concepts for low-cost extra-large habitats with open and close loop systems, and virtual reality technologies that will facilitate the training and work of astronauts and space workers. An ambitious but gradual deployment of habitational modules following market evolution and demands will create a platform that would eventually be able to host up to 100 humans around 2035.

A render of the look of such crewed and densely populated microgravity platform is presented next:



Finally, the plans for the Orbital Outpost One complex are to include a third platform, a few years later, also in the vicinity of the other two. Using the experience gained and momentum from the other two stations, a long (a third of a mile) baseline of truss structures will be implemented for the third station. Multiple habitats will be hosted at the two extremes, which will feature induced gravity of around 0,7g. This will allow a normalization and democratization of space, for many humans to work and live there, in environmental conditions very similar to that of Earth.

The habitational volumes of our envisioned and target LEO station shouldn't differ much from our office environment, or our favorite room at home, with the comparable safety, healthcare, and logistic support we need. When the comfort of Earth can be experienced in LEO, by humans who will be either living permanently, or spending extended periods of time, the first part of the roadmap of our Company will be completed, and the next one will start. This OO1 induced gravity environment in LEO is visualized in the next render:



As our company progresses through the different stages of its plan, follow-on stations are envisioned (OO2, 3, 4, etc.) in other space locations, both LEO and cislunar, laying the foundation for true space colonization. This phased approach ensures that the company can take a practical and sustainable approach towards enabling human colonization of space, while leveraging its valuable portfolio of key technologies to support the growth of a strong LEO economy. As this growth is always done modularly in response to changing demand there is a lower risk of over leveraging by building the stations or infrastructure for certain services before the market is ready.

5. The Broad Array of In-Orbit Services We Offer, & the Industries that Can Benefit.

Our company is committed to providing a wide range of in-orbit services, such as:

1st robotic platform

- In-orbit refueling
- Hosting services
- 3rd party payload hosting, support, and operations
- Fuel depot
- Hangarage / Stowage
- Orbital logistic support
- Shipyard in space for large systems assembly
- Space Gate and Gateway services for large propulsion stages

2nd crewed platform

- Crew training
- Space tourism
- Microgravity research
- In orbit assembly, and manufacturing in microgravity
- In-orbit servicing, such repairs and maintenance of space infrastructure

3rd induced gravity residential platform.

- Space real estate ownership
- Space Tourism
- Living residences
- Sports and Gaming
- Medical support
- Leisure activities
- Base for long crewed missions
- Starting point for asteroids mining missions

The development of a strong LEO economy and the advancement of space technology has the potential to benefit various industries. Companies involved in space tourism, microgravity research, space manufacturing, asteroid mining, and in-orbit servicing are likely to benefit from our broad range of services provided in OO1. The life sciences industry can benefit from the microgravity environment of space to conduct research and eventually in-space manufacturing with qualities that would not be feasible on Earth (like new drugs, tissue engineering, drug development, regenerative medicine, medical therapies, and devices). Our CLD can additionally bring about numerous benefits to various industries, including advertisement, media, movies, gaming, and others.

Development of space-based solar power systems, more capable integrated propulsion stages, integration of ambitious nuclear fission surface systems, exploration space systems, and large space telescopes, will all benefit from the abilities of the OO1 Shipyard.

6. Addressing the Barriers to Human Colonization of LEO: Funding and Regulations

6.1 Funding

We recognize that the maturity of enabling technologies, and the availability of large public and private funding, are two main barriers that need to be addressed; both are connected. The current economic environment makes large investments with long time to revenues even more challenging. To reduce investors' risks and bring earlier revenues SIV pursues the following approach:

- Develop key dual use technologies that help the OO1 vision and also have significant value on Earth, potentially establishing subsidiary companies for each technology, bringing in early revenue and reducing investors' risks by enabling investments in their technology and markets of choice.
- Create a scalable space infrastructure that is modular and adaptable to meet the demands of the market and the available capital.
- Prioritize safety while utilizing low-cost components for systems and subsystems to reduce costs.
- Maximize the potential for partnerships to leverage resources and expertise in pursuing our goals.

The lack of availability of large funding in the space economy can be a significant challenge. To address this, companies can consider several strategies to secure the necessary funding, including public-private

partnerships, venture capital, government grants and subsidies, and international cooperation and funding, and even crowdfunding.

Public-private partnerships

Public-private partnerships (PPP) can provide a significant source of funding for space initiatives, while also leveraging the expertise and resources of both the public and private sectors. For example, NASA's Commercial Low Earth Orbit (LEO) Development Program aims to establish a sustainable ecosystem in LEO through partnerships with private companies.

Crowdfunding by High-Valued Individuals

Crowdfunding through high-valued individuals can be a pivotal factor in driving the development of space initiatives and the establishment of a robust LEO economy. As the interest in space exploration grows, and the possibilities of unlocking unlimited space resources emerge, crowdfunding provides an exclusive chance for individuals to be a part of the progress in space technology and exploration. By participating in crowdfunding campaigns, high-valued individuals can help fund critical projects, including the development of advanced technologies for resource utilization and management, the creation of a market for in-orbit services, and the establishment of sustainable ecosystems in space.

Private equity and Venture capital

Private equity and venture capital funding has played a significant role in the growth of the space industry in recent years. With companies like Gravitics, Axiom, and Starfish Space securing significant funding, investors are bullish on the future of commercial space exploration and development. As more companies enter the market and technology continues to improve, we can expect to see even more investment and innovation in this exciting field.

Government grants and subsidies

Government grants and subsidies can provide a significant source of funding for space initiatives, particularly those that have strategic importance for national security or economic development. For example, the European Space Agency (ESA) provides funding for space initiatives through its various member states.

International cooperation and funding

International cooperation and funding can provide a way for countries to share the costs and risks of space initiatives, while simultaneously leveraging the expertise and resources of multiple countries. For example, the International Space Station (ISS) is a prime example of international cooperation in space, with the United States, Russia, Europe, Japan, and Canada all contributing to its development and operation.

6.2 Regulatory framework

The development of regulatory frameworks that can support commercial activities in space is another key challenge to the human colonization of LEO. Our company is actively engaged in working with

regulatory agencies to develop these frameworks, but additional collaboration and research are needed to ensure their effectiveness.

International treaties and agreements

International treaties and agreements, such as the Outer Space Treaty and the Moon Agreement, provide the foundation for the regulation of commercial activities in space. These agreements establish principles such as the non-appropriation of space and the responsibility for national activities in space.

National & International regulations

National and International regulations provide the legal framework for commercial activities in space, including licensing and authorization processes. For example, the United States has established the Commercial Space Launch Act and the Commercial Remote Sensing Act to regulate commercial activities in space. Other countries will enact their regulations or adopt / adapt international treaties.

Collaboration and consultation

Collaboration and consultation between regulatory agencies, industry stakeholders, and other interested parties can help to ensure that regulatory frameworks are effective and responsive to the needs of the industry. For example, the Federal Aviation Administration's Office of Commercial Space Transportation regularly consults with industry stakeholders to ensure that its regulations are effective and efficient.

7. Competitive Landscape for the Commercial LEO Destinations (CLDs)

The International Space Station 2022 Transition Plan laid out NASA's vision for the next decade of the microgravity laboratory. As part of the plan, NASA shared details on the current end-of-life plans for the station. NASA will transition operations and services in low-Earth orbit to private industry. This decommissioning of the ISS presents a significant challenge for the future of space exploration and research. However, the development of alternative platforms and strategies, such as commercial space stations, free-flying platforms, and enhanced propulsion systems, can provide new opportunities for continued exploration in space.

NASA's Commercial LEO Development Program is supporting the development of commercially owned and operated LEO destinations from which NASA, along with other customers, can purchase services and stimulate the growth of commercial activities in LEO. NASA has entered into a contract for commercial modules to be attached to a space station docking port and awarded space act agreements for the design of three free-flying commercial space stations. U.S. industry is developing these commercial destinations to begin operations in the late 2020s for both government and private-sector customers, concurrent with space station operations, to ensure these new capabilities can meet the needs of the United States.



Current CLD Partner Organizations:

- Axiom Space
- Blue Origin + Sierra Space
- Nanoracks + Lockheed Martin + Voyager Space
- Northrop Grumman

Additionally, several other private companies have unveiled their plans to develop and launch LEO destinations with various strategies and market approaches, with VAST and Space Forge among them.

8. Why We Are a Unique Proposition for CLDs

8.1 Alternative Approach.

While we respect and appreciate the work that Blue Origin, Nanoracks, Northrop Grumman, and Axiom Space are doing to advance commercial space initiatives and contribute to human colonization of space, our approach and vision are radically different from theirs.

Firstly, we focus on a much more ambitious program of work that targets a full LEO ecosystem with the ability to deliver a very large range of in-space services, thanks to the inherent design of our CLD.

Secondly the modularity and scalability of OO1 is perfectly fitted and adapted to growing market demands and will allow a stepwise investment profile too.

Thirdly, our concept is based on a robust financial model that reduces financial risks to investors, produces alternative revenue stream that do not depend on space, and results in a flexible space station that can respond quickly to market demand, and to customers' requirements.

Fourthly, we benefit from the vertically integrated plan that leverages many new space initiatives such as novel standardization of space habitational modules, advanced logistics and infrastructures, as well as in-orbit assembly creating a shipyard concept in space.

And lastly, the company start-up mindset allows for more flexible and cost-effective solutions than more traditional contractors that follow a space agency model, typically more expensive and complex one-off custom designs. We believe that our team's expertise, combined with our unique approach and commitment to developing a strong LEO economy, sets us apart from other companies in the space industry.

Although SIV recognizes that large funding availability is a key barrier to achieving our vision, we are exploring alternative funding sources and developing a valuable portfolio of key technologies to facilitate our plan. This approach is designed to be more flexible and adaptable to changing circumstances than relying solely on traditional funding sources, providing us with a sustainable path ahead.

In summary, while there are several companies working on commercial space initiatives and developing space stations, we believe that our differentiated approach, focus on sustainability, and exploration of

alternative funding sources, position us to make significant contributions to the future of space exploration and commercialization.

8.2 The advantage of being an entrepreneur-based company.

Having a singular vision, unified goal, and clear decision-making process is essential to the success of a company, especially one with a bold roadmap like SIV's OO1. Being an entrepreneur-based company, without restrictions, barriers, or compromises, offers distinct advantages that increase the likelihood of success in the competitive space industry.

Compared to large government contractors or other startups, entrepreneur-based companies enjoy several benefits. They can make quick, easy, and straightforward decisions without bureaucratic hurdles. They can pivot quickly to adapt to changing market conditions and technologies, and they have a strong sense of ownership and accountability that motivates them to succeed. These factors make entrepreneur-based companies an attractive option for those looking to innovate and disrupt the status quo.

Agility.

Small companies can be more agile and adaptable than large corporations, which allows them to respond quickly to changes in the market and technological advancements. This is especially important in the space industry, where new breakthroughs and innovations can rapidly change the game. This agility allows small companies to seize opportunities that may be missed by larger contractors, who are often slower to react due to their size and bureaucracy.

Funding Flexibility

While large companies and contractors must look to their stock market prices, they can't engage in heavily co-funded initiatives, but instead need to look at profits, which greatly compromises their ability to take on bold programmatic decisions in space programs as CLDs are, where time matters. The ability of private entrepreneurs and start-ups to raise private funding and their unparalleled flexibility allows for an array of endless growth strategies that are unavailable to well-established government contractors. This unparalleled flexibility empowers entrepreneurial companies to push the boundaries of innovation and disrupt the status quo. The result is a trailblazing approach that can lead to unprecedented success in the fiercely competitive world of business. Entrepreneur-based companies are often able to secure funding from a variety of sources, including private investors and venture capitalists. This allows them to be less reliant on government budgets and funding cycles, which can be subject to political considerations and fluctuations.

Entrepreneurship

Entrepreneurs tend to have a high level of risk tolerance and are willing to take on challenges that may be deemed too risky by larger organizations. This risk-taking mindset is essential in the space industry, where there are significant technical and financial challenges that need to be overcome. Smaller companies are often more willing to take risks to achieve breakthroughs and can pivot quickly if a particular approach doesn't work out.

Lower Cost

Small companies tend to have lower overhead costs and more efficient operations, which allows them to compete more effectively on price. This is especially important in the space industry, where launch costs and other expenses can be prohibitively high. Smaller companies can often offer more cost-effective solutions to customers, which can be a key competitive advantage.

Start-up Culture

Startups can benefit from a more entrepreneurial culture and mindset, which encourages innovation and creativity. This culture can help attract and retain top talent and can foster a more collaborative and dynamic work environment. This can be particularly important in the space industry, where innovation and creativity are essential to driving progress.

Furthermore, startups can use stock or stock options to recruit and retain talent, and to some extent to get the best people at lower salaries than large companies. That is, the team can directly benefit from their work to create successful products and technologies. This is particularly important in current “hot” industrial sectors which includes the New Space economy.

Other Advantages

An entrepreneur-based company has several other advantages. One of the biggest advantages is the ability to move quickly and nimbly in response to changes in the market and industry. NASA and ESA initiatives are often slowed down by layers of bureaucracy and lengthy approval processes, which can delay the implementation of new ideas and technologies. In contrast, an entrepreneur-based company can quickly pivot and adjust its strategy based on feedback from customers and the market. This agility allows the company to stay ahead of the competition and capitalize on emerging trends and technologies.

An entrepreneur-based company has the ability to attract top talent from a variety of industries. These companies often offer more flexible work arrangements and the potential for greater rewards and ownership stakes than traditional government agencies like NASA and ESA. This can lead to a more diverse and dynamic team that are better able to innovate and solve complex problems.

Finally, our agility, risk tolerance, efficient operations, and entrepreneurial culture allow us to compete effectively with larger contractors, while our track record of receiving grants from leading space organizations demonstrates our technical expertise and credibility in the industry.

We believe that the future of space exploration will rely heavily on private companies and entrepreneurs, working in collaboration with government agencies and other stakeholders. As such, our company is well positioned to thrive in this new era of commercial space exploration, leveraging our innovative technologies, talented team, and strategic partnerships to achieve our goals and advance the frontiers of human knowledge and achievement in space.

9. Conclusion

SIV's vision is to enable the population of Low Earth Orbit and beyond, with the goal of establishing a permanent human presence in space. We believe that developing a vigorous LEO economy, including a large human population living and working there, is critical to unlocking unlimited space resources.

Looking to the future, we believe that the human colonization of space is within reach, and we are committed to supporting the development of a strong LEO economy to make this a reality. With continued progress in technology, funding, and regulation, we believe that the human colonization of space will become a reality in the coming decades, opening a new frontier for humanity. We believe that the macroeconomic enablers discussed in this paper will continue to drive the growth of the space economy and enable us to achieve our ultimate goals.

We are committed to working towards our vision by developing a valuable portfolio of key technologies. Our company is currently actively engaged in developing such a valuable portfolio of key technologies, intended to facilitate the plan to deploy our Commercial Low Earth Orbit Destination; Orbital Outpost One (OO1) offers a broad array of in-orbit services. Those assets under development include 3D printing pressurized tankers, electrolyzers and regenerative fuel cells, standardization of connector interfaces, modular space infrastructure truss blocks, extreme reality software, capable orbital tugs concepts with robotic arms, and standardized space habitational modules, plus we are creating the disruptive concept of a shipyard in space.

However, we recognize that enabling technologies maturity and large funding availability are two main barriers that need to be addressed. To address these challenges, strategies such as public-private partnerships, venture capital, private equity, crowdfunding, grants, and awards are considered.

We strongly believe that we can provide a more cost-effective and profitable CLD solution than others, and that this will enable us to be a player not just in the emerging commercial LEO economy but in the future cislunar economy.

There are no barriers other than physics to human vision and will in space. The future is not defined, as we write it every day. Everything is possible if we really pursue it. The important thing is not where we stand today, but where we will be tomorrow. SIV is fully committed to deliver.