Identifying, Evaluating, and Overcoming Barriers to Market Growth in the Low Earth Orbit (LEO) Economy: Evidence-based Analysis

Executive Summary

June 7, 2021

Bryce's LEO commercialization model identifies 29 total markets across eight categories

- Accommodations
- Manufacturing
- Technology Testbed
- Satellite Assembly, Deployment, and Servicing
- Education and Entertainment
- Marketing
- Orbital Hub
- Orbital Platform

Based on NASA direction, Bryce focused the current study on how the agency could best support the emergence of *scalable, commercial microgravity manufacturing* on ISS and future crewed platforms

Bryce Appendix J Study Overview

Bryce's methodology for completing the study involved the following steps, which will be described in the slides to come

- **Updating Bryce's 2018 LEO Commercialization Model** to see if there have been major changes in the commercial landscape, with a focus on products that could be produced at scale in orbit
- **Identifying Barriers to Commercial Manufacturing in LEO** that NASA could address
- **Forecasting the Impact of Barrier Mitigation on LEO Manufacturing Markets** to see what the potential benefits of taking action to mitigate barriers could be
- **Prioritizing Barriers Based on Their Negative Impact on Manufacturing** to show which barriers NASA should focus on
- **Assessing Benefits and Costs of Potential Actions to Address Barriers** to give NASA a range of options for addressing the barriers
- **Recommending which Potential Actions to Prioritize** to help NASA determine which of those options should receive the agency's scarce resources and attention
- **Presenting Possible Next Steps for Implementation**

Commercial microgravity manufacturers face many barriers, but NASA has options for mitigating those barriers and increasing the chance that companies will succeed

Update Bryce LEO Commercialization Model

Identify Barriers to Commercial Manufacturing in LEO

Forecast Impact of Barrier Mitigation on LEO Manufacturing Markets

Prioritize Barriers Based on Their Negative Impact on Manufacturing

Assess Benefits and Costs of Potential Actions to Address Barriers

Recommend which Potential Actions to Prioritize

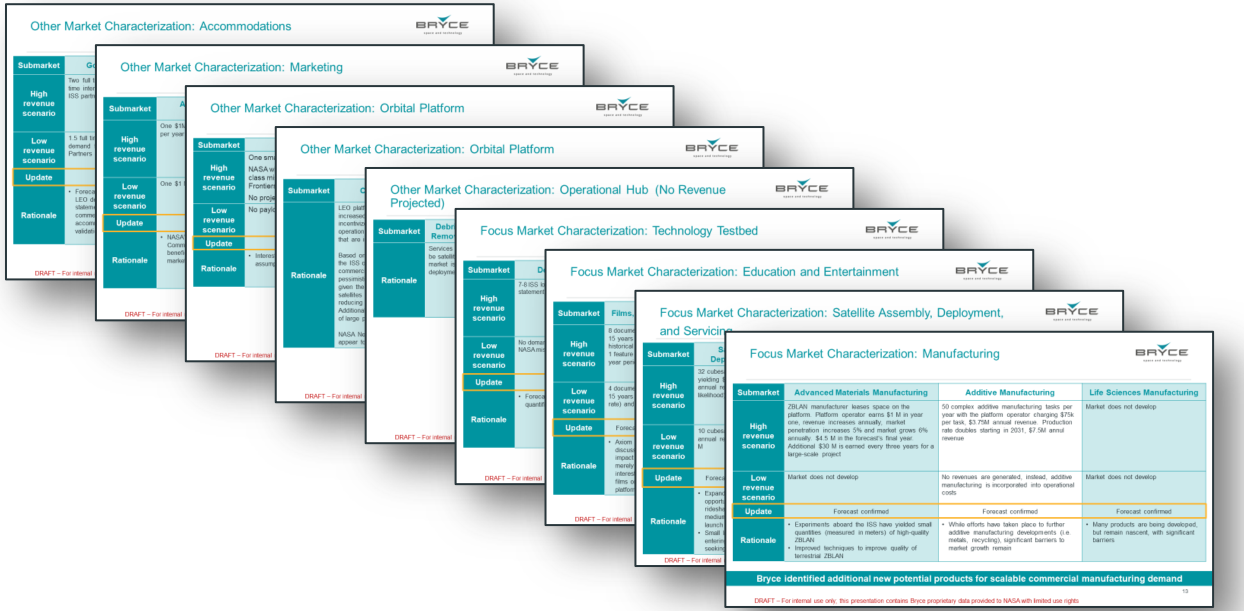
Present Possible Next Steps for Implementation

LEO Commercialization Market Update

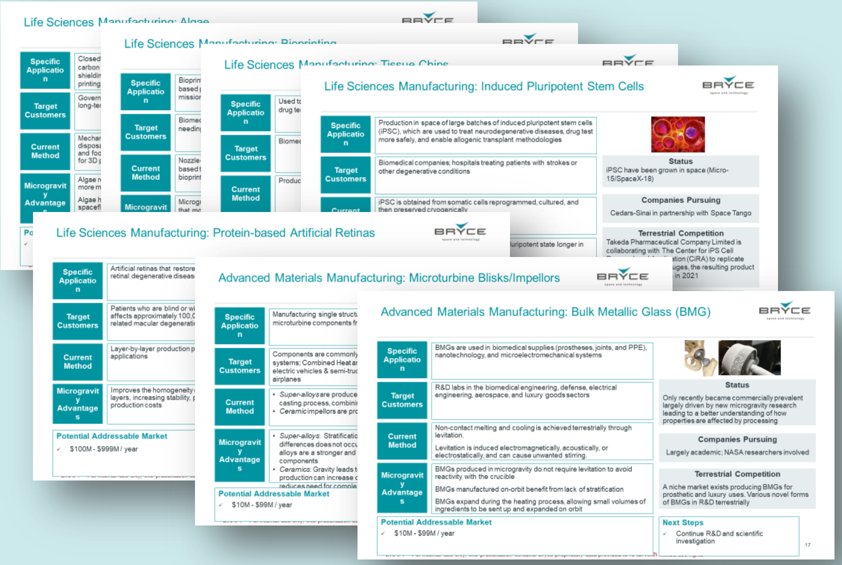
To assist in identifying barriers, Bryce updated/confirmed market forecasts for all existing LEO markets

For each of the 29 LEO commercialization markets Bryce:

- Identified High and Low revenue scenarios
- Provided updates to the market forecast
- Communicated rationale for update or confirmation of existing forecast



Bryce conducted additional research on several products that might be suitable for scalable LEO manufacturing



Update Bryce LEO Commercialization Model

Identify Barriers to Commercial Manufacturing in LEO

Forecast Impact of Barrier Mitigation on LEO Manufacturing Markets

Prioritize Barriers Based on Their Negative Impact on Manufacturing

Assess Benefits and Costs of Potential Actions to Address Barriers

Recommend which Potential Actions to Prioritize

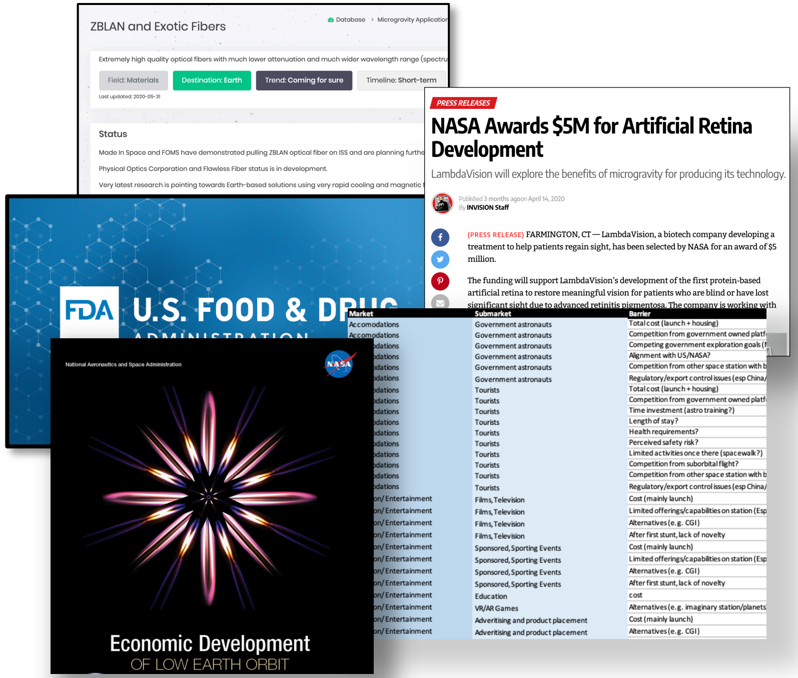
Present Possible Next Steps for Implementation

Barrier Research

To understand barriers to manufacturing, Bryce:

Reviewed and Updated Its 2018 LEO Forecast

In 2018, Bryce conducted market assessments for NASA's LEO commercialization study, which leveraged proprietary databases on space activity, and built on heritage work



Researched Potential LEO Manufacturing Products and Barriers

Bryce reviewed 100+ analyses of potential activities in LEO, conducted detailed research on scalable manufacturing markets

Interviewed Stakeholders

Bryce has conducted more than twenty interviews to build market expertise and identify particularly important and easy to mitigate barriers

Barrier Categories

Barrier Category	Category Description
Transportation	It can be costly, difficult, or slow to get materials and products to or from ISS
Financing	Companies do not have enough funding to make the investments needed to develop or manufacture their products
Regulation	Producing medical products on ISS will raise novel questions for FDA regulators
Crew Time	Limited astronaut crew time, attention, and expertise for ISS-based research and development negatively impacts innovation
Safety Practices	The processes and restrictions that affect companies' operations on ISS can be burdensome to companies trying to bring their products to market
ISS Awareness	Many terrestrially-focused companies that could benefit from microgravity production may not be aware that that R&D and production on ISS is an option
Platform Uncertainty	Uncertainty about the future of ISS and NASA support for LEO commercialization has a chilling impact on both companies planning microgravity manufacturing ventures and financiers considering investments

Barrier: Transportation

Barrier Description

- Getting cargo to and from ISS is very expensive (if not subsidized by NASA)
- Transportation to ISS can be unreliable, infrequent, and inflexible (difficult to shift between launches if necessary)
- Cargo space to ISS must be booked years in advance
- Options for getting cargo back from ISS are limited (though this may change when Dream Chaser comes online)
- No feasible “Downmass on Demand” options on horizon
- Cold and powered stowage capacity is currently limited, which affects many biologically-focused investigations

Community Insights

“Capacity on Dragon and Cygnus is limited and fills up way in advance. There is a two-year wait to get a commercial payload launched about those vehicles.”

- Potential materials manufacturer

“Developing these [life sciences manufacturing projects] is an iterative endeavor that requires multiple flights to Station. If each of those flights takes a couple years or more to set up. . . If we had to pay a little more to get more flights, we would almost certainly do that.”

- Life sciences manufacturer

Barrier: Financing

Barrier Description

- Companies face a financing “Valley of Death” after they have moved beyond the angel/SBIR levels of funding (<$1M) needed for initial R&D but before they have completed the technology demonstrations needed to convince VC-level funders to invest in production
- Technology demonstrations can cost tens of millions of dollars, and more than one demo may be needed before scalable commercial production can begin

Community Insights

“A lot of NASA funding only covers one flight. It often takes multiple flights [and more expensive demos] to get a product to the point where we can start attracting real customers and real investment.”

- Microgravity manufacturer

“NASA is making investments into developing new capabilities, which has helped us accelerate our path forward. . . but current stuff is in the stage after basic research is done but not yet at the clear product with a customer stage.”

- Microgravity manufacturer

Barrier: Regulation

Barrier Description

- Companies considering the production of medical devices and biological materials on ISS have expressed concerns that they will have difficulty getting FDA approval for their products because the agency’s regulatory processes do not anticipate orbital production (e.g. how would FDA inspect a production facility on ISS?)
- FDA typically has stringent chain of custody requirements for medical products; it may be difficult or costly for NASA and the commercial cargo providers to conform to those requirements

Community Insight

“How does FDA inspect a biomedical production facility in orbit?”

- Life sciences manufacturer

Barrier: Crew Time

Barrier Description

- Crew time available for commercial projects has been limited and the astronauts on ISS typically do not have expertise relevant to those projects
- Lack of crew time makes it difficult for companies to iterate, follow-up, or troubleshoot
- Companies need to spend significant time automating their experiments as much as possible (making them a “black box” with no need for human intervention)
- The more companies automate their manufacturing processes, the more they consider switching to an uncrewed microgravity platform or a freeflyer as an alternative to a crewed platform

Community Insights

“Crew time is a major constraint. Since they have such limited capacity, we work hard to automate many of our payloads, but that takes time and effort and reduces ability to iterate.”

- Life sciences and advanced materials manufacturer

“The astronauts on station are great, but they aren’t like the Shuttle payload specialists. They don’t have a lot of expertise or specific training on our machinery and they don’t have the time to help us innovate or resolve issues, which means we have to spend a lot of time turning our experiments or demos into “black boxes”, without the need for much or any human attention.”

- Life sciences manufacturer

Barrier: Safety Processes

Barrier Description

- NASA processes designed to protect ISS and its human crewmembers are (or at least are perceived to be) overly restrictive, time-consuming, and expensive to comply with for companies
- While companies understood how important it is to protect ISS and its crew, there was a general belief that the processes could be improved and tailored to more directly address real risks

Community Insights

"Getting anything through NASA's ISS safety process can be very frustrating."

- Multiple interviewees

"In the future, a platform like Dream Chaser may make more sense for our experiments than ISS because it would just involve fewer hassles."

- Microgravity manufacturer

Barrier: ISS Awareness

Barrier Description

- Many companies that could potentially make use of ISS have little or no awareness of it as a platform
- Very few companies (e.g. Nanoracks, Made In Space, and Space Tango) seem to be focused on ISS as a platform for scalable production
- There may be more potential microgravity entrepreneurs out there that do not realize the potential of ISS:
  - large non-space firms with substantial resources and an interest in technologies helped by microgravity production
  - smaller technology firms in those markets
  - microgravity researchers who have not seriously considered commercial applications for their products

Community Insight

"How can we involve a larger swath of the economy in microgravity production? There must be better ways of promoting what we're doing."

- NASA ISS program official

Barrier: Platform Uncertainty

Barrier Description

- While there is still some uncertainty about the future of ISS and follow-on platforms, that anxiety appears to have subsided significantly over the last couple of years due to NASA's actions
- There are questions about when and how NASA subsidization of activity on ISS will change (i.e. how and when does NASA intend to transition ISS users off of existing transportation subsidies?)

Community Insights

"We really appreciate all that NASA has done over the last few years to promote these markets and reduce uncertainty."
- Life sciences manufacturer

"When I was in government a few years ago, companies and microgravity researchers used to come to me regularly and express their fears about what was going to happen with ISS and whether they would have a place to operate in LEO. I rarely hear those concerns expressed anymore."
- Former White House space policy official

Update Bryce LEO Commercialization Model

Identify Barriers to Commercial Manufacturing in LEO

Forecast Impact of Barrier Mitigation on LEO Manufacturing Markets

Prioritize Barriers Based on Their Negative Impact on Manufacturing

Assess Benefits and Costs of Potential Actions to Address Barriers

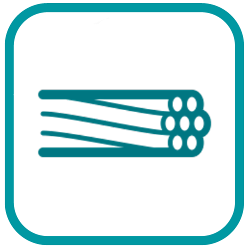
Recommend which Potential Actions to Prioritize

Present Possible Next Steps for Implementation

Barrier Mitigation Forecast

Bryce focused its analysis of the impact of barrier mitigation on manufacturing markets, as they are the most capable of supporting scalable industrial activity on a crewed LEO platform

Advanced Materials Manufacturing



Exotic Fiber Optics*

High-Quality Machine Parts

Life Sciences Manufacturing

Thin Film Products

Bioprinted Materials

*Of these products, only Exotic Fiber Optics (ZBLAN) was far enough along in development to enable analysis at the time of the 2018 Bryce LEO Commercialization study

Within these sub-markets, Bryce analyzed four manufacturing products that:

- Appear to have a good chance of being economically significant;
- Have been developed enough that Bryce could obtain sufficient detail about their market potential and the barriers the products will face; and
- Are broadly representative of the LEO commercial manufacturing market, so that the barrier analysis will be relevant for other products

While Bryce researched several other potential manufacturing products, they had not reached a point where Bryce could predict significant revenue streams from them

The Four Focus Products

Exotic Fiber Optics

Producing a high-quality exotic fiber optic material, such as ZBLAN, for use on Earth.

Microgravity advantages: Reduces impurities, heterogeneous crystallization, and vitrification in production processes

High-Quality Machine Parts

Manufacturing single structure blades, impellors, and other microturbine components from super-alloys and ceramic materials

Microgravity advantages: Creates stronger components or increases the complexity of materials

Thin Film Products

Producing thin film products such as artificial retinas

Microgravity advantages: Improves the homogeneity of the alternating protein and polymer layers, increasing stability and performance; potentially lower production costs

Bioprinted Materials

Printing tissues and three-dimensional biological structures for use in medical treatments for terrestrial patients

Microgravity advantages: Allows for the creation of three-dimensional structures that resemble tissues in the human body because tissues are less susceptible to collapsing in on each other

Technology and Competitive Challenges

Product	Technology Challenge	Terrestrial Competition
Exotic Fiber Optics	**Medium** • Several R&D missions already done to develop technology • Long strands are still difficult to produce, but that seems surmountable	**High** • Robust terrestrial competition and existing market • Strong possibility of flash freezing as terrestrial high-quality alternative • Already high-quality terrestrial fiber alternatives
High-Quality Machine Parts	**Low** • Demos starting in next several months • Wide variety of products to pursue, so likelihood of dead end is small	**Medium** • Significant terrestrial competition, but quality differences are very important • Wide variety of products to pursue, so the company has flexibility • $/kg likely high, so transportation costs not prohibitive
Thin Film Products	**Medium** • Production processes already being refined • Will likely take several years to perfect, but no known major hurdles	**Low** • Existing terrestrial competition is extremely expensive or inconvenient • May be difficult to produce high-quality retinas in gravity and centrifuges probably not an option • $/kg very high, so transportation costs not prohibitive
Bioprinted Materials	**High** • Many years away from even early demos • Printing an organ from scratch will be enormously difficult	**Medium** • Likely will be an enormous effort by major life sciences firms to print organs terrestrially • Advantage of microgravity for printing organs might be insurmountable

Each of the products faces significant technological challenges and tough terrestrial competition independent of the barriers related to microgravity production

Barriers to Success

	Short-Term (2021 – 2025)	Medium-Term (2026 – 2030)	Long-Term (2031- 2035)
Transportation	Limited access slows innovation. Biological research requires more cold stowage and power	Cargo cadence may be insufficient for scaled up demand. How will cargo space will be purchased, allocated?	Unclear roles and responsibilities in a post-ISS system. Potential challenges if subsidies are reduced
Crew Time	Lack of crew time. Difficult to troubleshoot or iterate		Unclear if new platforms will offer subsidized (or any) crew time
Financing	Without Federal funding for demos, difficult to attract private financing		Most business plans assume that their markets will take several years to ramp up
Regulation	Life sciences manufacturers need to satisfy FDA regulators	Regulatory scrutiny likely tougher for more complex biological products	
Safety Practices		NASA's safety practices not designed for production at scale. Safety standards are inconsistent	
Platform Uncertainty		Uncertain availability of ISS resources if production at scale	Scaled production may need new platforms. More investments difficult if uncertain of platform availability

Relevance of Barrier by Product

Barrier	Exotic Fiber Optics	High-Quality Machine Parts	Thin Film Products	Bioprinted Materials
Transportation				
Financing				
Regulation				
Crew Time				
Safety Practices				
ISS Awareness				
Platform Uncertainty				

Substantial Impact

Moderate Impact

Little/No Impact

If not mitigated, barriers will reduce the chance that higher revenue scenarios occur. Bryce estimated how much the barriers, if addressed, would increase the chance of commercial success over time

Expected Value of Barrier Mitigation on Market Size

Estimated change in likelihood of high revenue scenario ***with*** Barrier Mitigation

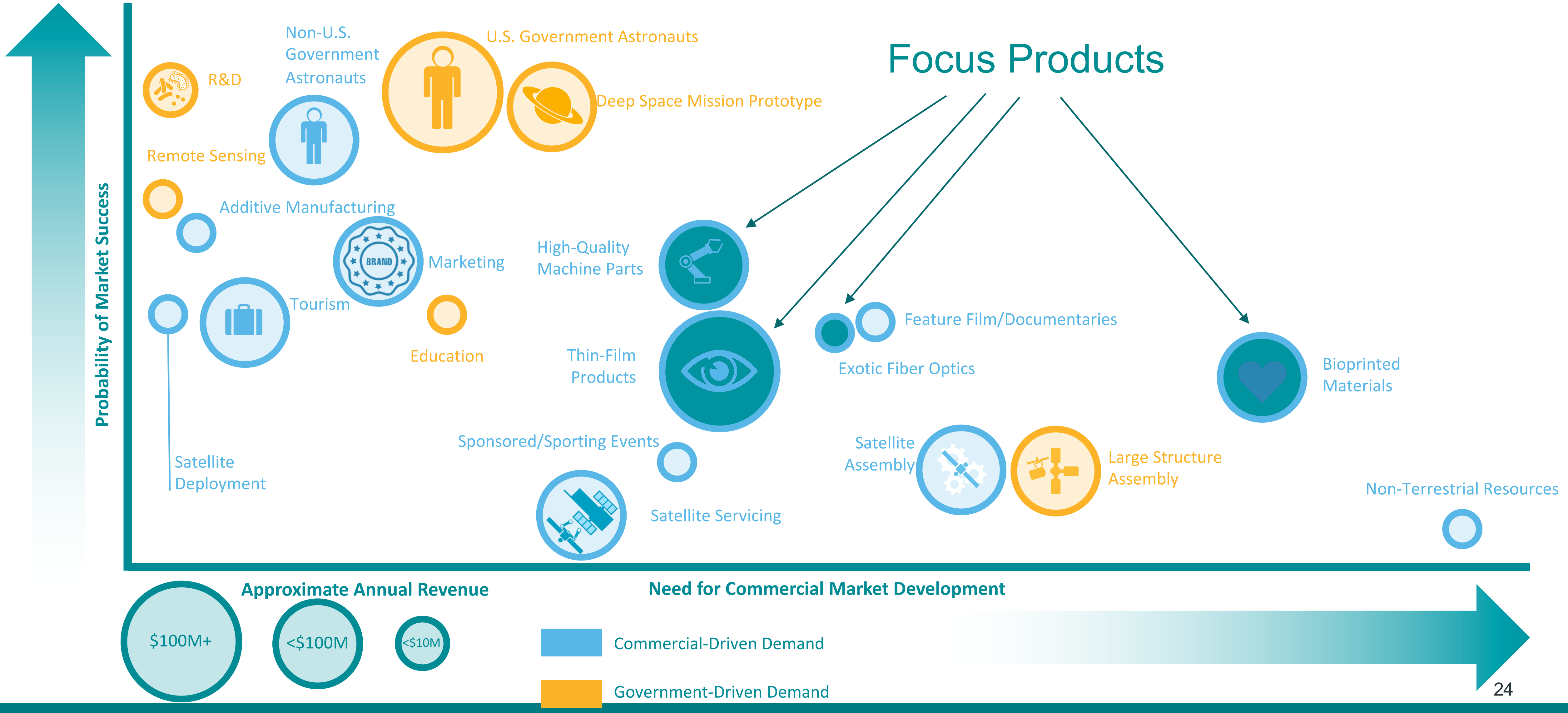
Product	Short-Term (2025)	Medium-Term (2030)	Long-Term (2035)
Thin Film Products	+30%	+20%	+30%
High-Quality Machine Parts	+10%	+15%	+25%
Bioprinted Materials	+10%	+10%	+20%
Exotic Fiber Optics	+20%	+20%	+20%

Analysis assumes some barriers cannot be fully “mitigated” in most realistic scenarios

Value of Barrier Mitigation

Product	Case for Barrier Mitigation
Thin Film Products	Likelihood of $1B future annual market increases by **4x**
High-Quality Machine Parts	Likelihood of $100Ms future annual market increases by **2x**
Bioprinted Materials	Likelihood of $10Ms future annual market increases by **2x**
Exotic Fiber Optics	Likelihood of $10Ms future annual market increases by **3x**

Future LEO Commercial Revenue Based on Today's Demand Drivers (Update)



Update Bryce LEO Commercialization Model

Identify Barriers to Commercial Manufacturing in LEO

Forecast Impact of Barrier Mitigation on LEO Manufacturing Markets

Prioritize Barriers Based on Their Negative Impact on Manufacturing

Assess Benefits and Costs of Potential Actions to Address Barriers

Recommend which Potential Actions to Prioritize

Present Possible Next Steps for Implementation

Mitigation Priority

Barrier	Impact on Commercialization			Impact on NASA		Mitigation Priority
	Short-Term	Medium-Term	Long-Term	Benefits	Risks/Costs	
Transportation						High
Financing and Insurance						High
Regulation						High
Crew Time						Medium
Safety Practices						Medium
ISS Awareness						Medium
Platform Uncertainty						Medium

Substantial Impact

Moderate Impact

Little/No Impact

Update Bryce LEO Commercialization Model

Identify Barriers to Commercial Manufacturing in LEO

Forecast Impact of Barrier Mitigation on LEO Manufacturing Markets

Prioritize Barriers Based on Their Negative Impact on Manufacturing

Assess Benefits and Costs of Potential Actions to Address Barriers

Recommend which Potential Actions to Prioritize

Present Possible Next Steps for Implementation

Remedial Actions Overview

Bryce identified **20** specific remedial actions to address the barriers to LEO commercialization

High Priority Barriers
Transportation
Consider Manufacturing Needs in CRS-3 Design
Facilitate Small Capsule Deliveries to ISS
Increase CRS Providers’ Cold/Powered Stowage Capacity
Support Downmass Technology Development
Offer Longer-Term Manifest Allocation Commitments
Conduct a Logistics Expert Exchange
Financing
Fund LEO Commercial Technology Demonstrations
Coordinate with SBA and Commerce Assistance Programs
Partner with Other Agencies on Microgravity Investments
Propose Tax Subsidies for Microgravity Manufacturing
Leverage SBIR/STTR Program for Commercialization R&D
Regulation
Help Life Sciences Manufacturers Comply with FDA Regulations

Medium Priority Barriers
Crew Time
Re-establish NASA Payload Specialist Role
Subsidize Commercial Astronauts on ISS
Study Telerobotics and Remote Access Options for LEO
Safety Practices
Create a Pilot Program for Third Party Safety Certification
Survey Best Practices for ISS Payload Review Processes
ISS Awareness
Fund a National Academies Microgravity Competitiveness Study
Create a Technology Ambassadors Team at NASA
Use Joint Microgravity Experiments to Attract New Participants

Platform-Related Barriers
Addressed separately

Platform Uncertainty is an Important, but not Imminent, Barrier

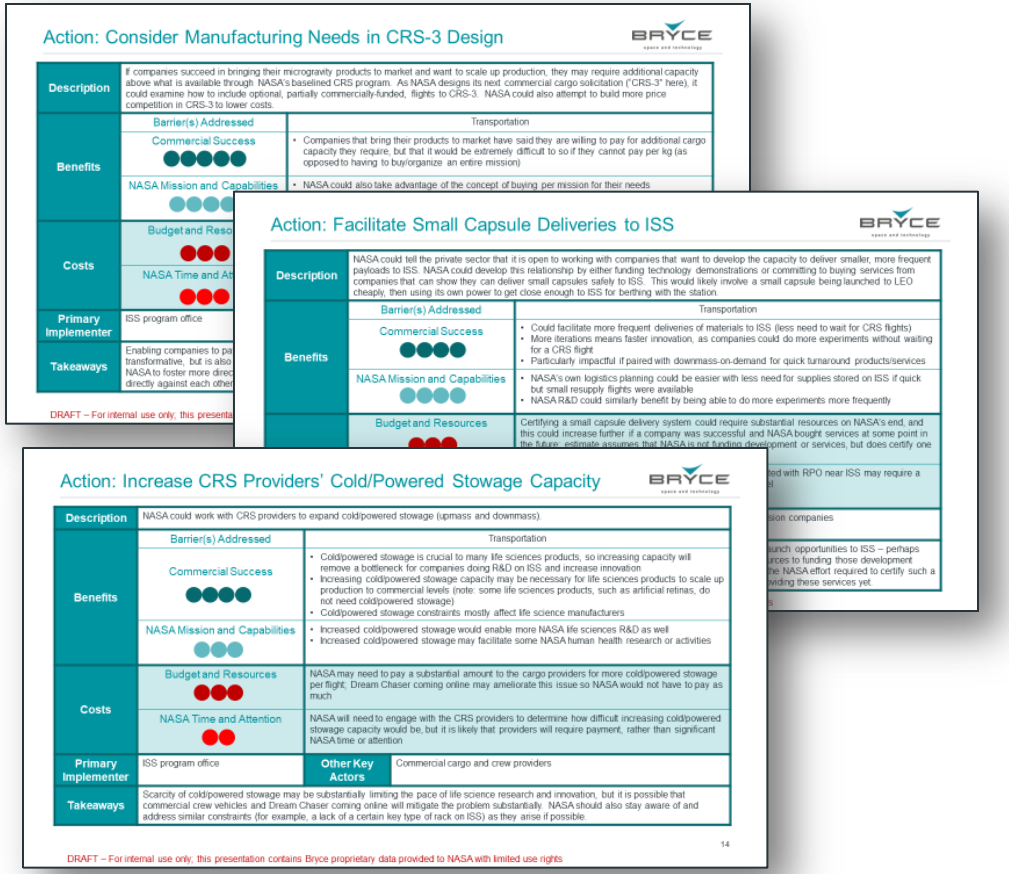
BRYCE TECH

- LEO commercialization is hampered by uncertainty about whether there will be a platform or platforms capable of hosting scaled-up manufacturing production in the future once NASA transitions away from ISS
- The general assumption among stakeholders is that ISS will remain in roughly its current state until at least 2028 or 2030 (with a commercial module or two probably being added over the next several years)
- Platform uncertainty was therefore not an imminent barrier to commercialization for most of the companies we interviewed
- Companies did express concern about how the current ISS system will transition to whatever comes after it, and what that post-ISS future looks like
  - This uncertainty makes it difficult for companies to effectively make long-term plans
  - Uncertainty about the future of ISS and LEO more generally also impacts potential LEO investors
- Based on anecdotal experience from past ISS extension cycles, serious anxiety starts to set in 5-7 years before the presumed ISS end date
- In past cycles, the level of concern among stakeholders was relatively high even though it was very likely that ISS would be extended
- This time, extension past 2030 is much less certain, so the anxiety may be stronger

Assessments of Potential Remedial Actions

For each of the 20 remedial actions, Bryce developed an assessment containing:

- A description of the remedial action
- The barrier or barriers the action is intended to address
- **Assessment of benefits**
  - Impact of action in reducing barriers to commercialization
  - Benefit of the action to NASA's mission and capabilities
- **Assessment of costs**
  - Budgetary cost of implementing action successfully
  - Amount of time and attention needed from NASA to implement
- Which entity or entities within NASA would need to take the lead on implementation of the action
- Other key actors or stakeholders



Summary of Estimated Impact of Actions

Remedial Action	Impact on LEO commercial success	NASA Mission and Capabilities	Budget and Resources	NASA Time and Attention
Consider Manufacturing Needs in CRS-3 Design	●●●●●	●●●●	●●●	●●●
Re-establish NASA Payload Specialist Role	●●●●●	●●●●	●●●●	●●●●
Fund LEO Commercial Technology Demonstrations	●●●●●	●	●●●●●	●●●
Help Life Sciences Manufacturers Comply with FDA Regulations	●●●●●	●	●	●●
Facilitate Small Capsule Deliveries to ISS	●●●●	●●●●	●●●	●●●
Increase CRS Providers' Cold/Powered Stowage	●●●●	●●●	●●●	●●
Subsidize Commercial Astronauts on ISS	●●●●	●●	○	●●●
Partner with Other Agencies on Microgravity Investments	●●●●	●●	○	●●
Propose Tax Subsidies for Microgravity Manufacturing	●●●●	●	○	●●●
Coordinate with SBA and Commerce Assistance Programs	●●●●	●	○	●
Support Downmass Technology Development	●●●	●●●	●●●●	●●
Create a Pilot Program for Third Party Safety Certification	●●●	●●●	●	●●●
Fund a National Academies Microgravity Competitiveness Study	●●●	●●●	●●	●
Leverage SBIR/STTR Program for Commercialization R&D	●●●	●	○	●
Offer Longer-Term Manifest Allocation Commitments	●●●	●	○	●
Create a Technology Ambassadors Team at NASA	●●	●●●	●●	●●
Survey Best Practices for ISS Payload Review Processes	●●	●●	●	●
Conduct a Logistics Expert Exchange	●	●●	●	●
Study Telerobotics and Remote Access Options for LEO	●	●	●	●
Use Joint Microgravity Experiments to Attract New Participants	●	●	●	●

Update Bryce LEO Commercialization Model

Identify Barriers to Commercial Manufacturing in LEO

Forecast Impact of Barrier Mitigation on LEO Manufacturing Markets

Prioritize Barriers Based on Their Negative Impact on Manufacturing

Assess Benefits and Costs of Potential Actions to Address Barriers

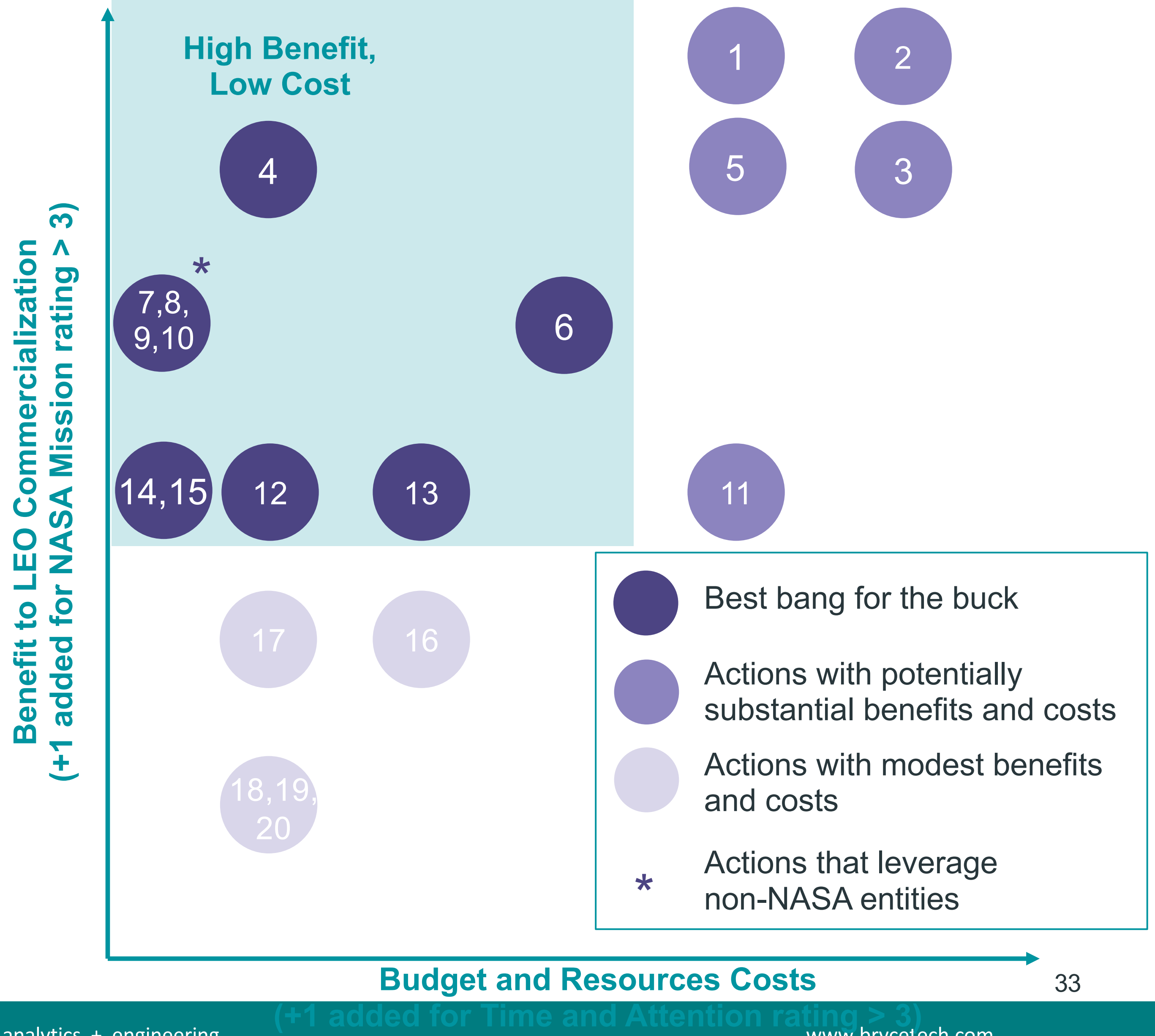
Recommend which Potential Actions to Prioritize

Present Possible Next Steps for Implementation

Ranking the Actions by Estimated Impact

Remedial Actions

1. Consider Manufacturing in CRS-3
2. Re-establish NASA Payload Specialist
3. Fund LEO Commercial Tech Demos
4. Help Life Sciences Manufacturers w/ FDA Regs
5. Facilitate Small Capsule Deliveries to ISS
6. Increase CRS Providers' Cold/Powered Stowage
7. Subsidize Commercial Astronauts on ISS
8. Partner with Agencies on µg Investments
9. Propose Tax Subsidies for µg Manufacturing
10. Coordinate with SBA and Commerce Assistance Programs
11. Support Downmass Technology Development
12. Create a Pilot Program for Third Party Safety Certification
13. Fund a National Academies µg Study
14. Leverage SBIR/STTR Program for Commercialization R&D
15. Offer Longer-Term Manifest Allocation Commitments
16. Create a Technology Ambassadors Team
17. Survey Best Practices for ISS Processes
18. Conduct a Logistics Expert Exchange
19. Study Telerobotics and Remote Access Options for LEO
20. Use Joint Experiments to Attract New Participants



Categorizing and Prioritizing the Actions

Best Bang for the Buck: NASA Actions

Help Life Sciences Manufacturers Comply with FDA Regulations

Increase CRS Providers' Cold/Powered Stowage

Create a Pilot Program for Third Party Safety Certification

Fund a National Academies Microgravity Competitiveness Study

Leverage SBIR/STTR Program for Commercialization R&D

Offer Longer-Term Manifest Allocation Commitments

Actions with Potentially Substantial Benefits and Costs

Consider Manufacturing Needs in CRS-3 Design

Re-establish NASA Payload Specialist Role

Fund LEO Commercial Technology Demonstrations

Facilitate Small Capsule Deliveries to ISS

Support Downmass Technology Development

Best Bang for the Buck: Leveraging Non-NASA Resources

Subsidize Commercial Astronauts on ISS

Partner with Other Agencies on Microgravity Investments

Propose Tax Subsidies for Microgravity Manufacturing

Coordinate with SBA and Commerce Assistance Programs

Actions with Modest Benefits and Costs

Create a Technology Ambassadors Team at NASA

Survey Best Practices for ISS Payload Review Processes

Conduct a Logistics Expert Exchange

Study Telerobotics and Remote Access Options for LEO

Use Joint Microgravity Experiments to Attract New Participants

Actions in **bold** appear most likely to have a significant impact, based on Bryce analysis

Update Bryce LEO Commercialization Model

Identify Barriers to Commercial Manufacturing in LEO

Forecast Impact of Barrier Mitigation on LEO Manufacturing Markets

Prioritize Barriers Based on Their Negative Impact on Manufacturing

Assess Benefits and Costs of Potential Actions to Address Barriers

Recommend which Potential Actions to Prioritize

Present Possible Next Steps for Implementation

Timeline for Remedial Actions

As Soon as Possible	Within the Next Year	Longer-term
Consider Manufacturing Needs in CRS-3 **Re-establish NASA Payload Specialist** **Fund LEO Commercial Tech Demos** **Help Manufacturers w/ FDA Regs** **Increase CRS Cold/Powered Stowage** **Fund a National Academies µg Study** **Survey Best Practices for ISS Processes**	Partner with Agencies on µg Investments Propose Tax Subsidies for µg Manufacturing **Coordinate with SBA and Commerce Assistance Programs** Create a Technology Ambassadors Team	Subsidize Commercial Astronauts on ISS **Create a Pilot Program for Third Party Safety Certification** Conduct a Logistics Expert Exchange

Anytime

Facilitate Small Capsule Deliveries to ISS
Support Downmass Technology Development
Leverage SBIR/STTR Program for Commercialization R&D

Offer Longer-Term Manifest Allocation Commitments
Study Telerobotics and Remote Access Options for LEO
Use Joint Experiments to Attract New Participants

BryceTech partners with technology and advanced R&D clients to deliver mission and business success.

BryceTech has partnered with technology and R&D clients to deliver mission and business success for nearly 20 years. Bryce combines core competencies in analytics and engineering with domain expertise. Our teams help government agencies, Fortune 500 firms, and investors manage complex programs, develop IT tools, and forecast critical outcomes. We offer clients proprietary, research-based models that predict critical outcomes and enable evidence-based decision making. Bryce cultivates a culture of engagement and partnership with our clients.

BryceTech

DC Metro • Chicago • London
(703) 647-8078
info@brycetech.com

@BryceSpaceTech

www.brycetech.com

https://www.linkedin.com/company/brycespaceandtechnology