Agenda (Afternoon)

12:30 – 1:15: LUNCH BREAK

1:15 – 1:45: TASK #5: Commercial space transportation research alliance

1:45 – 2:15: TASK #6: Infrastructure funding

2:15 – 2:30: BREAK

FAA Briefing to COMSTAC

2:30 – 3:30: Response to open COMSTAC recommendations, advisory circular (AC) and policy updates, future of licensing

3:30 – 3:40: Public Comment Period

3:40 – 3:50: COMSTAC Recommended Taskings for Fall Meeting

3:50 – 3:55: Closing remarks by COMSTAC Chair and Vice-Chair

3:55 – 4:00: Closing remarks and Adjournment by DFO Brian Verna

Task 5

Proposal for a Spaceflight and Traffic Research Institute

Presented by the COMSTAC R&D Working Group

April 23, 2024

COMSTAC R&D Working Group

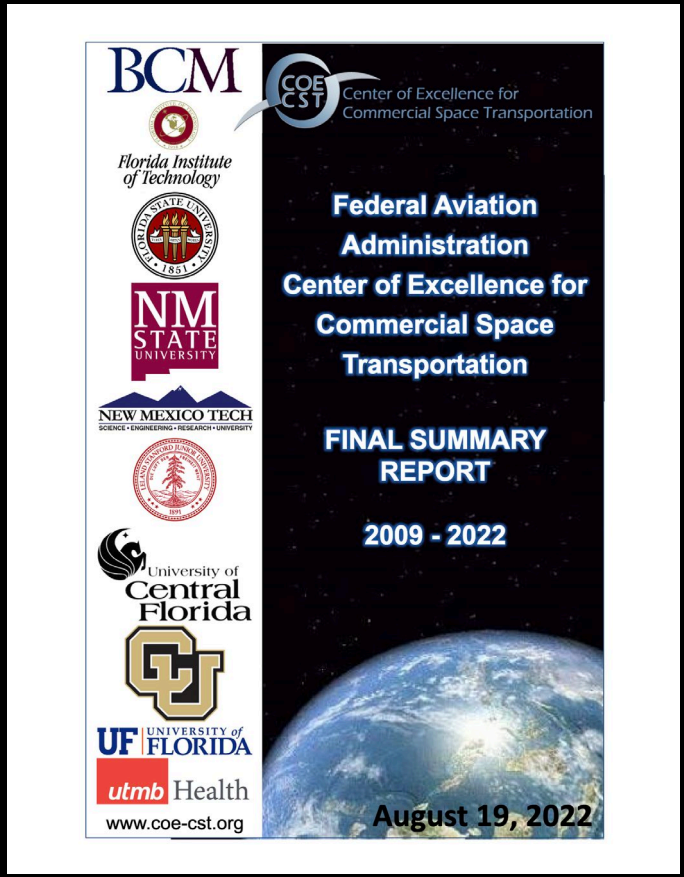
- Chair
  - Dr. Moriba Jah
- Co-Chair
  - Ms. Sita Sonty
  - Dr. Dava Newman
  - Ms. Amanda Simpson

COMSTAC R&D Working Group Task

- Research options on Commercial Space Transportation standing up a Spaceflight & Traffic Research Institute made up of government, industry, and academia, to foster research and development. This would be a follow-up to the Commercial Space Transportation Center of Excellence and provide a recommended path to implement that includes potential funding, structure, and
- governance.

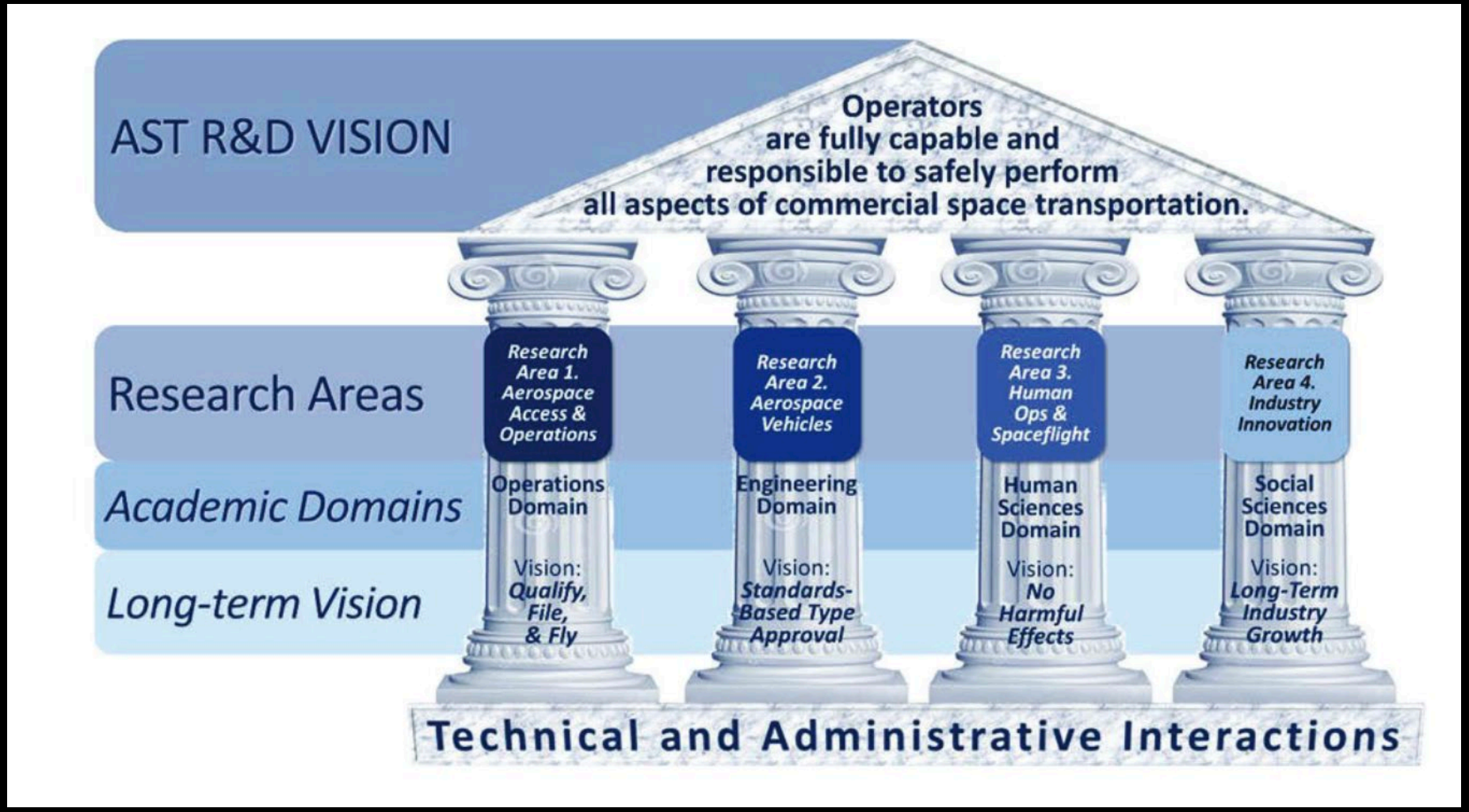
Background

Center of Excellence for Commercial Space Transportation

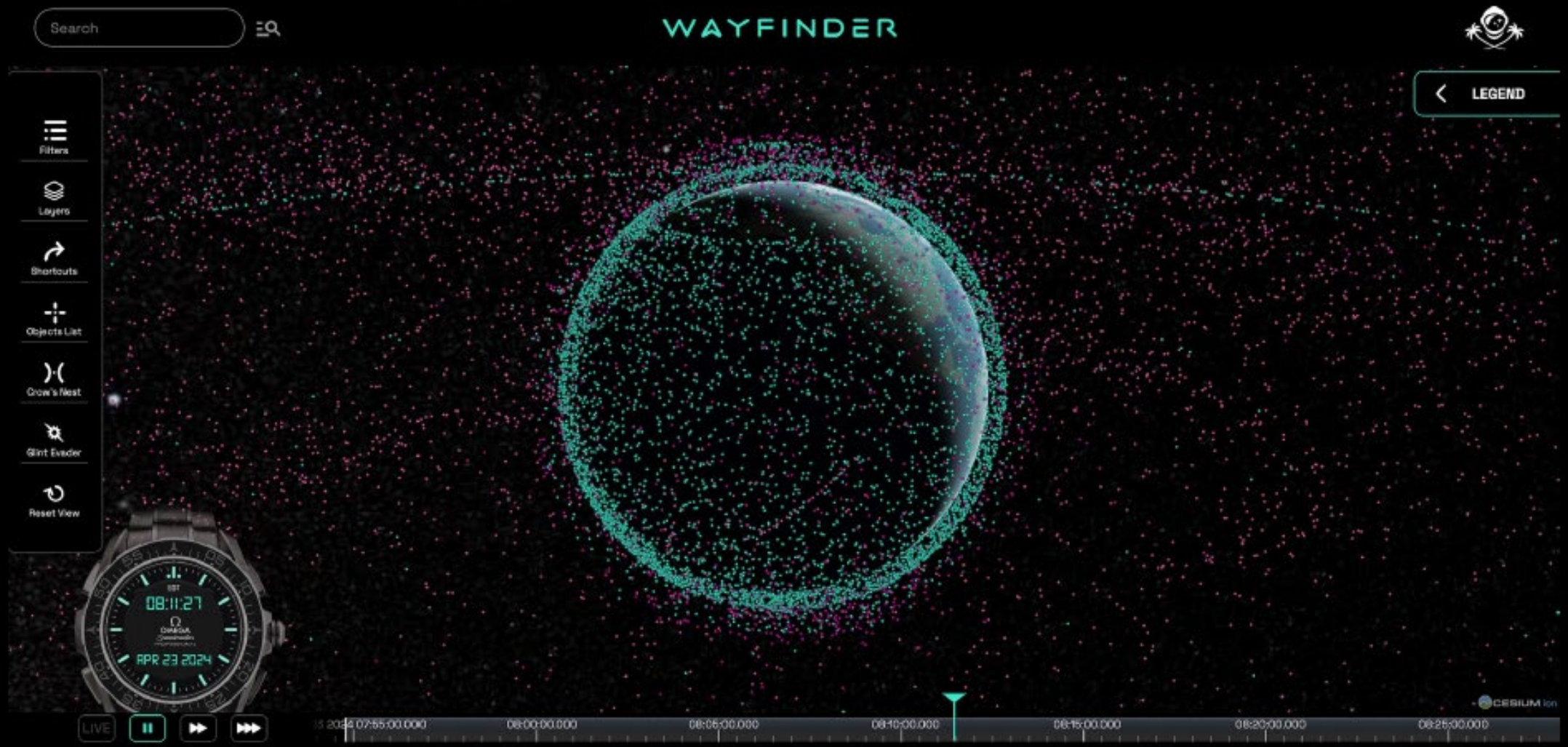


- Established in 2010
- Involved 10 member universities and 36 industry partners
- Funded at approximately $1M per year for 10 years, with requirement for 1:1 match for all federal dollars spent
- Ended in 2022, with no replacement in place to allow academia to engage in commercial space transportation research

COE Research Areas



Example of the COE Success



U.S. Human Spaceflights Since July 2021

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Government Astronauts: 24
Non-Gov Astronauts: 96

Inspiration4

Axiom-1, 2, & 3

6 Flights
Crew 3, 4, 5, 6, 7, & 8

Unity 22, 25, Gal 01-06

NS-16, 18, 19, 20, 21, & 22

NASA's Mercury 7 Astronauts

- NASA has over 60 years of data on how spaceflight affects the health of its astronauts.
- However, NASA astronauts are typically young, in excellent health, and in outstanding physical condition.

Recent Commercial Astronauts

Wally Funk
Age 82

William Shatner
Age 90

Haley Arceneaux
Childhood Cancer
Survivor

Jon Goodwin
Age 80
Diagnosed with
Parkinson's

Commercial Space Transportation Research Opportunity

- Future flyers on commercial space flights are likely to be older, with a variety of existing health conditions, and be less fit than their NASA counterparts.

Standard Guide for Medical Qualifications for Suborbital Vehicle Passengers (ASTM F3568-23)

"Companies currently are required under 51 USC § 80905 (b) (5) to inform spaceflight participants about the mission-related risk, but the specific risk of certain medical conditions has yet to be determined"

CSF/MITRE Workshop to Create a Human Research Program for Spaceflight Participants in the Commercialization of Space – May 2021

Workshop on the Human Research Program for Civilians in Spaceflight and Space Habitation

CO-SPONSORED BY:

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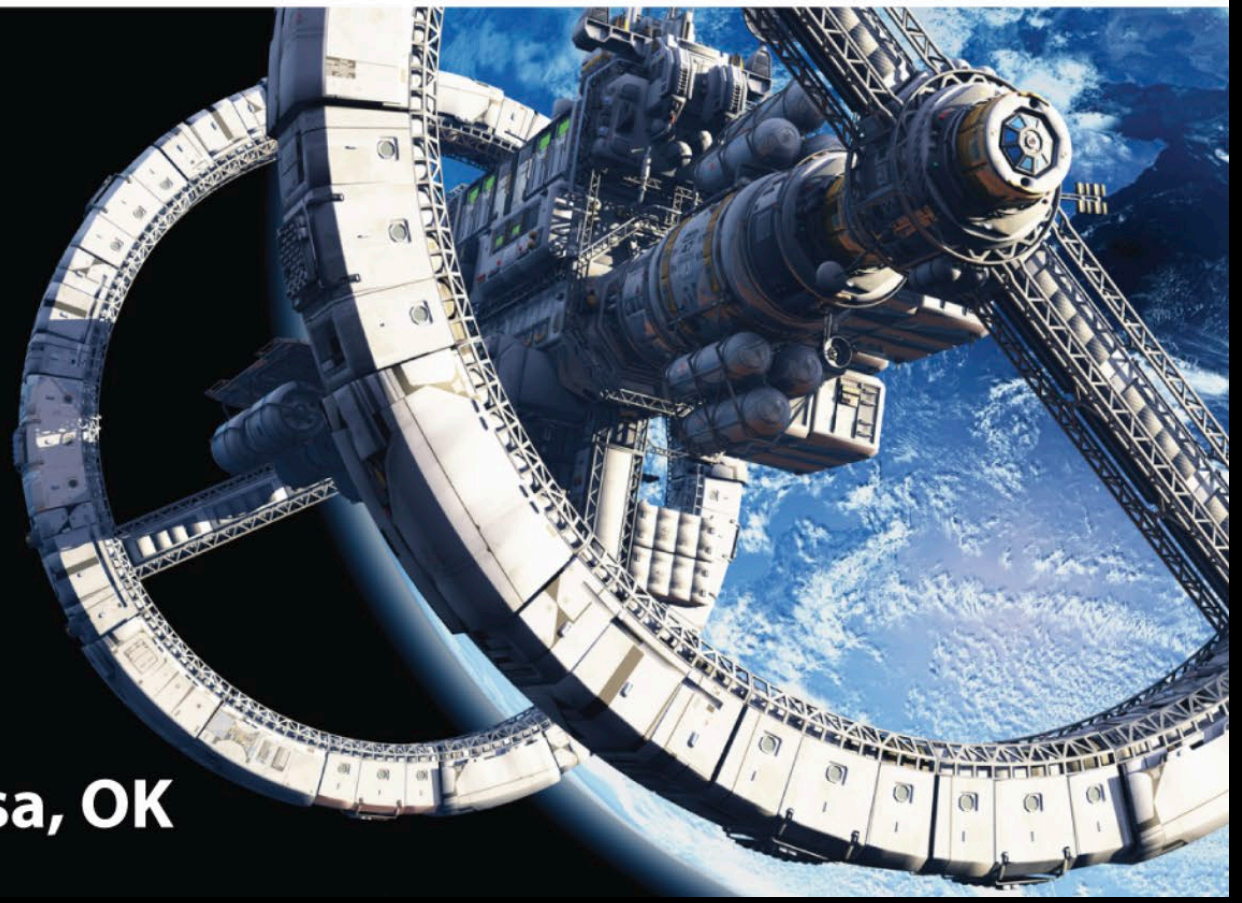
GLOBAL SPACEPORT ALLIANCE

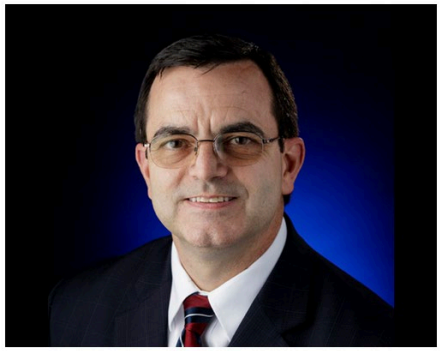
OSU



January 23 – 24, 2024, Tulsa, OK

Workshop Speakers

Jim Bridenstine
Former NASA Administrator



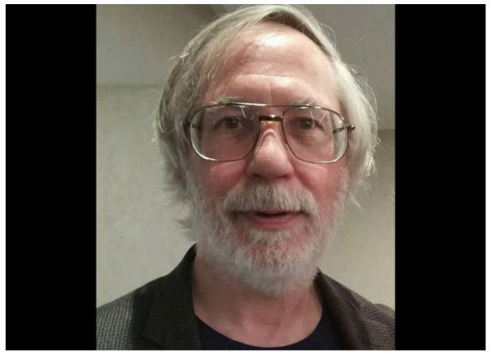
Dr. JD Polk
NASA, Chief Health and Medical Officer

Dr. Thomas Marshburn
Sierra Space, Chief Medical Officer

Victor Glover
NASA Astronaut

Dr. Melchor Antuñano
Civil Aerospace Medical Institute, Director

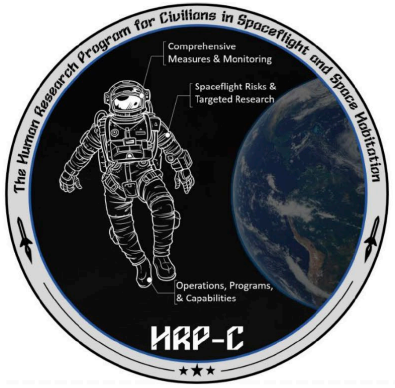
Dr. Jennifer Fogarty
Chief Scientific Officer, TRISH



Dr. Mark Shelhamer
Johns Hopkins School of Medicine

Dr. Simonetta Di Pippo
Former Director, UN Office for Outer Space Affairs

The Human Research Program for Civilians in Spaceflight and Space Habitation (HRP-C)



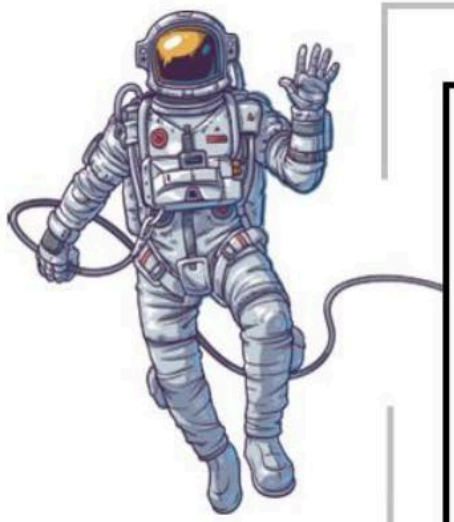
Editors

Michael Marge, EdD[1,2,3,4], Michael A Schmidt, PhD[5,6], and Bettina L. Beard[7,8]

[1]Research Professor, SUNY Upstate Medical University; [2]former Co-Director, NIH/NASA Collaborative Research Program; [3]former Scientific and Technical Consultant for NASA and the MITRE Corporation; [4]Vice-Chair of the IAASS Workshop PI. Committee; [5]Sovaris Aerospace, CEO/CSO, Boulder, CO USA; [6]Board of Governors, Life Sciences & Biomedical Engineering Branch, Aerospace Medical Association; [7]NASA Ames Research Center; [8]Chair of the IAASS Human Performance & Health Technical Committee

Human Research Program for Civilians in Spaceflight and Space Habitation (HRP-C)

HRP-C Structure



Research
Track 1
Comprehensive Measures & Monitoring

Research
Track 2
Spaceflight Risks & Targeted Research

- Space Health Reporting System (SHRS)
- Human Specimen Biorepository
- Human Spaceflight Data Repository
- Human System Risk Board for Civilians (HSRB-C)
- IRB for Civilian Spaceflight (IRB-C)
- Ethics and Rights

- Physician Continuing Education
- Civilian Training

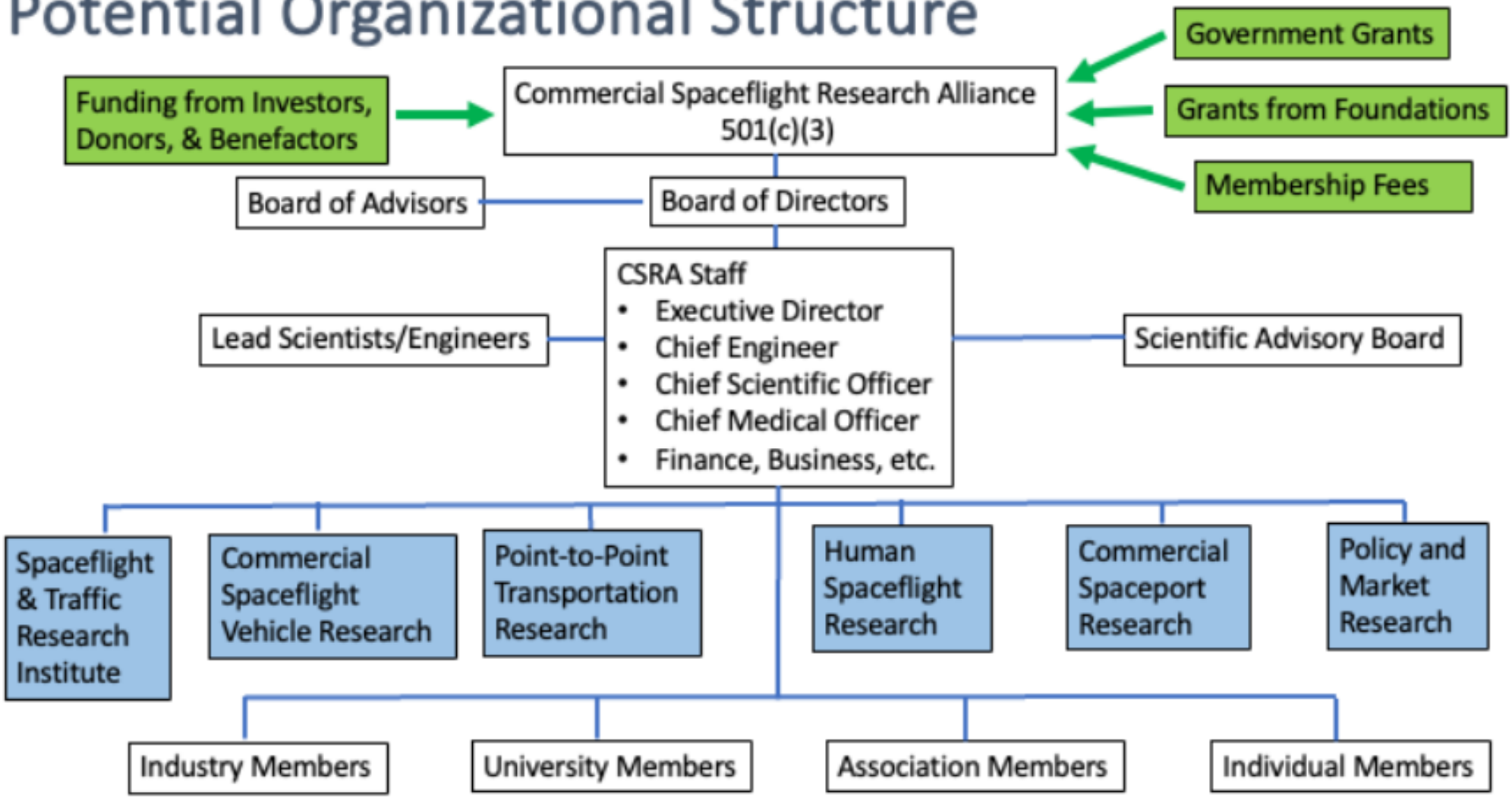
- AI and Predictive Modeling
- Precision Medicine
- Countermeasure Development
- Terrestrial Applications Program
- Preparation and Contingencies
- Food, Nutrition, and Metabolism

Track 3
Operations, Programs, & Capabilities

Space Traffic Situational Awareness

- FAA needs improved screening of launches against anthropogenic space objects (ASOs)
- FAA needs more adaptive, timely, and realistic national airspace (NAS) deconfliction against launches
- FAA needs physically and statistically realistic models of atmospheric ASO reentries for NAS risk quantification and management and general public safety

Potential Organizational Structure



Key Questions Related to Implementation

- Who will oversee and administer the program?
- How will the program be funded?

Implementation Options

- Ad Hoc Research (Status Quo)
- Government Program
- Public/Private Partnership
- Non-Government Program

Ad Hoc Research (Status Quo)

- Some research is already being conducted by:
  - NASA, industry, and academia
- Examples:
  - Individual commercial human spaceflight companies or teams could carry out research on the missions they conduct
  - A university could obtain access to some data and conduct research
  - TRISH or other research entity could obtain access to some data and conduct research for their customer (such as NASA)

Ad Hoc Research (Status Quo) (cont.)

- Advantages
  - No new organization required
  - No new federal funding required
- Disadvantages
  - Research progress (if any) would be extremely slow
  - High risk of duplication and inefficiency

Government Program

- Could be managed by:
  - NASA, DOT, FAA, AST, CAMI, DOC, NSF, HHS, NIH
- Examples
  - NASA Human Research Program
  - FAA's Center of Excellence for Commercial Space Transportation (2010-2022)

Government Program (cont.)

- Advantages
  - Substantial federal funding could enable a robust and timely research program
  - Federal funding could encourage widespread industry participation
- Disadvantages
  - Gaining approval for a new government program will be challenging
  - Government programs typically come with numerous constraints and can be slow to respond to needed changes

Public/Private Partnership

- Could be managed by:
  - An existing FFRDC (such as Aerospace Corporation or MITRE)
  - A new FFRDC
  - A new Commercial Spaceflight Research Alliance, with funding provided by FAA, DOT, or NASA
- Examples
  - TRISH, whose goal is “to solve the challenges of human deep space exploration.” TRISH has a 12-year cooperative agreement with NASA that has a total value of $245.7M.

Public/Private Partnership (cont.)

- Advantages
  - Congressional approval for a public/private partnership may be easier to obtain than for a new government-administered program
  - Federal funding could encourage widespread industry participation
- Disadvantages
  - If there is a lack of federal funding at the outset, the program would be reliant on grants or donations
  - If there is a lack of federal funding at the outset, it may be difficult to obtain widespread industry participation and collaboration

Non-Government Program

- Could be managed by:
  - A university
  - An existing non-profit organization
  - A new non-profit formed for this specific purpose
- Examples
  - A research program related to tolerance of acceleration exposure during centrifuge-simulated suborbital flights was conducted by UTMB and Virgin Galactic using the NASTAR Center centrifuge

Non-Government Program (cont.)

- Advantages
  - Congressional approval would not be required to initiate the program.
  - A "bottoms-up" approach, under which organizations wishing to participate would provide the funding needed to support their specific role in the overall program, could allow at least some progress even without significant federal funding
  - With less government involvement, the program could be faster moving, more innovative, and more collaborative
  - The program would not be directly tied to Congressional schedules and appropriations

Non-Government Program (cont.)

- Disadvantages
  - Even though there may be some government funding eventually, without substantial federal funding at the outset, the program would likely be reliant on membership fees or grants from foundations, investors, or philanthropic individuals
  - Without substantial federal funding, it may be difficult to obtain widespread industry participation and collaboration

Implementation Recommendations

- Establish the Spaceflight and Traffic Research Institute as a nonprofit Non-Governmental Organization [501(c)(3)]
- Research Institute Basic Principles:
  - All interested parties from government, industry, and academia are welcome (and encouraged) to participate
  - Focused on research and data sharing, not regulations
  - Collaborative in nature
  - International in scope

Potential Partner Focus Areas

- Space Health Reporting System
- Human Specimen Biorepository
- Human System Risk Board for Civilians
- IRB for Civilian Spaceflight
- Physician Continuing Education
- Civilian Training
- Artificial Intelligence & Predictive Modeling
- Precision Medicine
- Countermeasure Development
- Terrestrial Application Program
- Preparation and Contingencies
- Food, Nutrition, and Metabolism
- Space Situational Awareness (atmospheric exit and reentry)

Potential Members and/or Partners

- Commercial Spaceflight Companies
- Government Space Agencies
- Universities and Educational Institutions
- Insurance Companies
- Pharma Companies
- Health/Life Science Companies
- Venture Capital Companies
- Industry Associations
- Space Situational Awareness Companies
- Individuals

Workshop Follow-on Actions (Already Underway)

- Determine interest in participation from Workshop participants and other stakeholders
- Engage with potential donors, investors, and benefactors to solicit initial funding
- Pursue government grants to support continuing operations

Observations

- Given the rapid pace of activity, there is an urgent need (and opportunity) for government, industry, and academia to collaborate in performing commercial spaceflight and traffic research.

Recommendation

- The Secretary of Transportation should competitively award a cooperative agreement to a university, nonprofit, or not-for-profit organization to establish a consortium that would operate a Spaceflight and Traffic Research Institute
- The cooperative agreement should be awarded for a period of 10 years.
- An appropriate initial value of the award would be $30M per year.

Report to COMSTAC

Task 6

Innovation & Infrastructure Working Group

April 23, 2024

Agenda

- Innovation & Infrastructure Working Group Team
- I&I Working Group Task for Spring 2024
- Context
- History of Airport Infrastructure Funding
- Potential Options
- Recommendations

Infrastructure Funding

Innovation & Infrastructure Working Group Team

Chair	Ms. Melanie Preisser Executive VP, York Space Systems	
Co-Chair	Dr. George Nield President, Commercial Space Technologies, LLC	
Member	Mr. Dale Ketcham VP Government & Community Relations, Space Florida	
Member	Major General Roosevelt (Ted) Mercer, Retired CEO, Virginia Spaceport Authority	

I&I Working Group Task for Spring 2024

- Evaluate space transportation infrastructure funding options and assist in the implementation of the most promising approach.
  - Background: In its report to Congress in December 2020 (GAO-21-154), the GAO encouraged the FAA to examine a range of potential options to support space transportation infrastructure, noting that the FAA had focused on only two existing programs, rather than a range of options, because of limited time and resources.

Context

- The federal government has traditionally provided substantial funding to develop, repair, or upgrade all forms of transportation infrastructure, including funding for roads, bridges, and the interstate highway system; railroads; airports; and seaports.
- Today there is NO comparable program to provide funding for space-related infrastructure, such as for spaceports.
- Given the importance of space operations to our national security, technological leadership, and economic competitiveness, it is vitally important that federal programs be established for the development, enhancement, and maintenance of spaceport infrastructure to enable those activities.

History of Airport Infrastructure Funding

- Financial support for airport infrastructure by the federal government began during World War II.
- The Federal Airport Act of 1946 created the Federal Aid to Airports Program, which called for a national plan to create a system of public airports to meet the needs of civil aeronautics, including both air commerce and private flying.
- Appropriations were authorized from the general fund, at a level not to exceed $100 million per year (the equivalent of more than $1.1 billion today).

History of Airport Infrastructure Funding (cont.)

- The Airport and Airway Trust Fund was created in 1970, using assessments on aviation users and fuel to operate the Trust Fund.
- The current Airport Improvement Program was established in 1982, along with the requirement for the Secretary of Transportation to develop and publish biannually the National Plan of Integrated Airport Systems (NPIAS).
- The 2018 FAA Reauthorization Act authorized $3.35 billion per year from FY2019 to FY2023, with an additional $1 billion in discretionary funding.

Potential Options

- In June 2020, the Global Spaceport Alliance prepared a National Spaceport Network Development Plan for the FAA Office of Spaceports. Several existing options were identified that could be used to provide financial support for space transportation infrastructure, including:
  - Airport Improvement Program
  - Space Transportation Infrastructure Matching Grants Program
  - DOT Discretionary Grants Programs
  - Joint DoD/FAA Infrastructure Program
- Although any of the identified options could be implemented, all would require significant changes to meet current and anticipated spaceport needs.

Long-term Solution

- As a potential alternative, a Spaceport Network Improvement Program was proposed that would incorporate lessons learned from previous programs and address the limitations of existing options to create a comprehensive, time-phased, and sustainable approach.
- Because such an approach would involve establishment of a Spaceport and Spaceway Trust Fund, potentially supported by a cargo tax (for satellites, payloads, and experiments), plus a Spaceflight Participant Ticket Tax, it should not be fully implemented until the global space economy could support such charges.

Near-term Solution

- In the near term, the fastest, most straight-forward, and most effective method of providing spaceport infrastructure funding would be to make minor modifications to the existing Space Transportation Infrastructure Matching (STIM) Grants Program and provide adequate funding to support identified spaceport facility needs.

Identified Spaceport Infrastructure Requirements

- As part of a survey of U.S. spaceports conducted in support of the National Spaceport Network Development Plan:
  - 10 Spaceports submitted infrastructure project requirements
  - 44 Different projects were identified
  - The total estimated cost is over $382 million

Recommendation 1

- Update the Space Transportation Infrastructure Matching (STIM) Grants Program, by changing the maximum Federal share from 50% to 90% (to be consistent with what is done for Airport Grants), and by deleting the requirement for a 10% private sector match.
- Increase the program funding level to $100 million per year.
- Prioritize grant awards based on the project benefit to the National Spaceport Network in terms of Safety, Capacity, Efficiency, and Resiliency.

Observations

- The National Security Council is currently evaluating the nation's critical infrastructure under Presidential Policy Directive 21.
- Some in industry believe that "Space" should not be considered as a "sector" when it comes to critical infrastructure designation, since many space-based capabilities and their enabling infrastructure are already included within critical infrastructure sectors, such as the critical manufacturing, communications, defense industrial base, government infrastructure, and transportation systems sectors.

Observations (cont.)

- However, spaceports are obviously essential for achieving assured access to space, and they are not currently included in the other groupings.
- A thorough cost-benefit analysis would be helpful in assessing whether it would be appropriate to designate spaceports as critical infrastructure, including the potential implications for federal funding and the need for implementing regulations (if any).

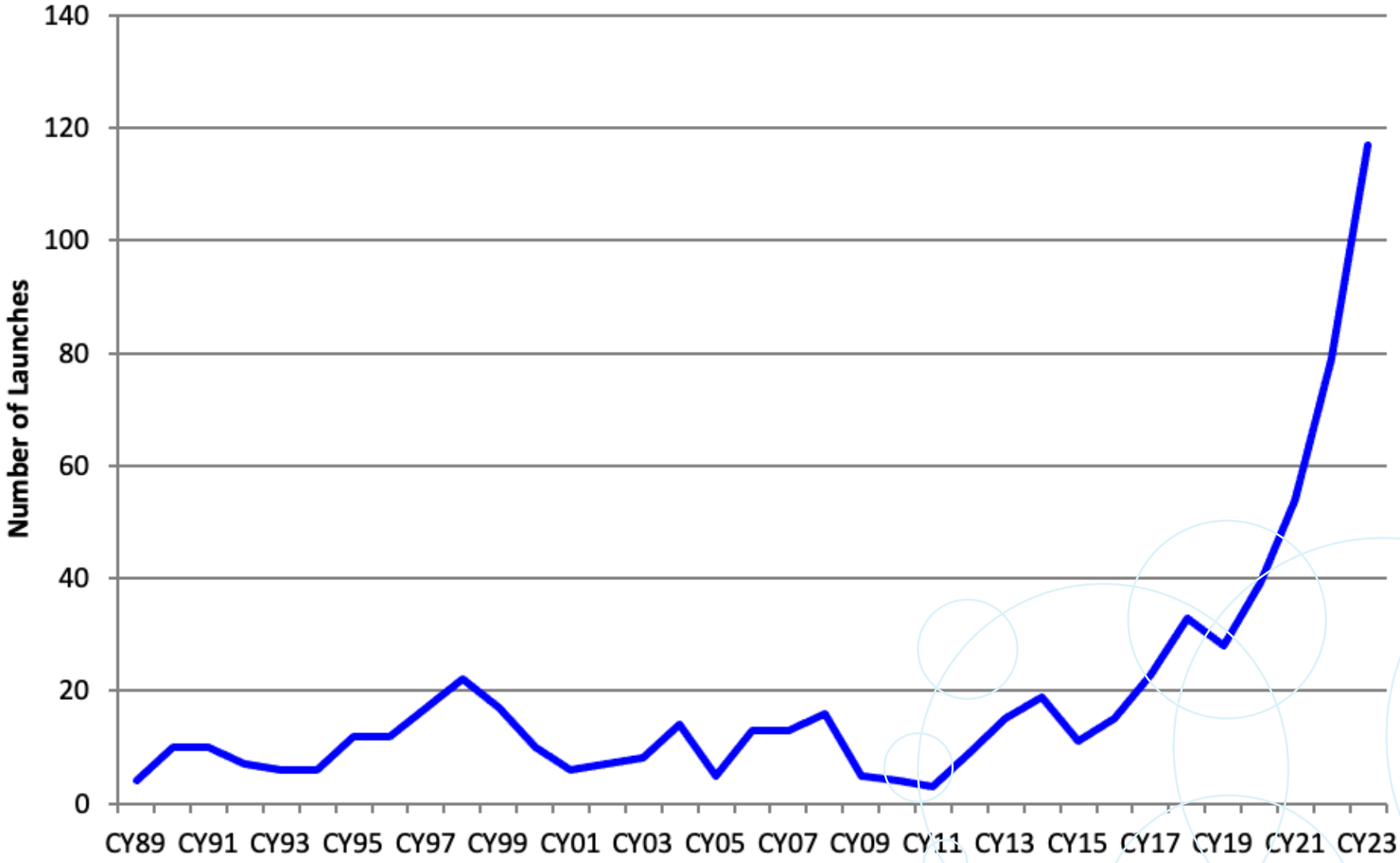
A Bigger Picture Problem?

Key Issues Needing Attention

- Spaceport Infrastructure Funding
- Commercial Space Transportation Research
- Commercial Human Spaceflight Training
- Point-to-Point Transportation through Space
- Planning for a Human Spaceflight Rescue Service

Is the lack of progress on these issues a symptom of a bigger problem?

FAA Licensed Launches per Calendar Year



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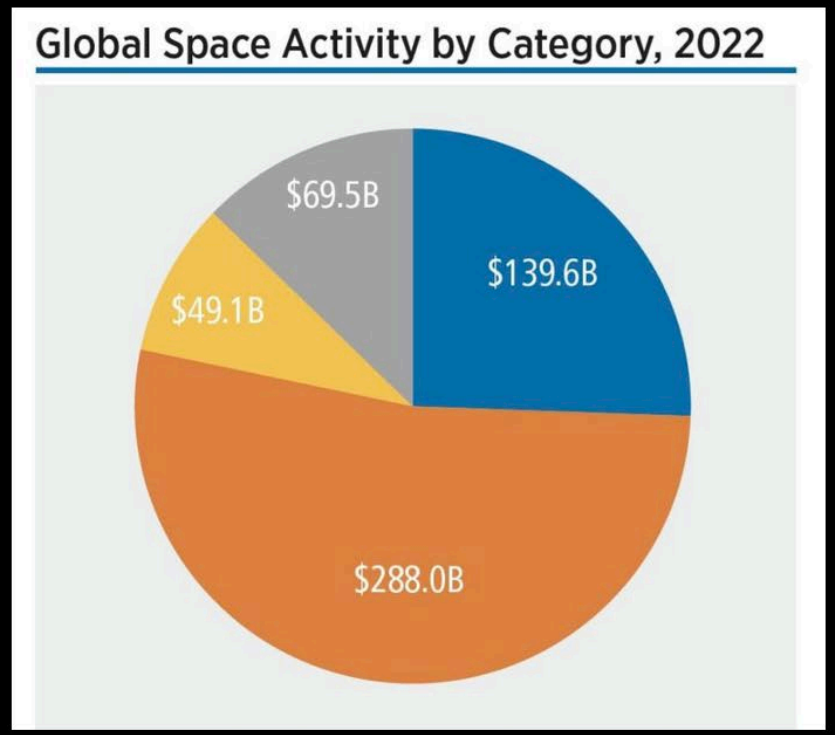
U.S. Spaceports

The Global Space Economy Now Totals $546B, According to the Space Foundation



Expectations for Growth of the Space Economy

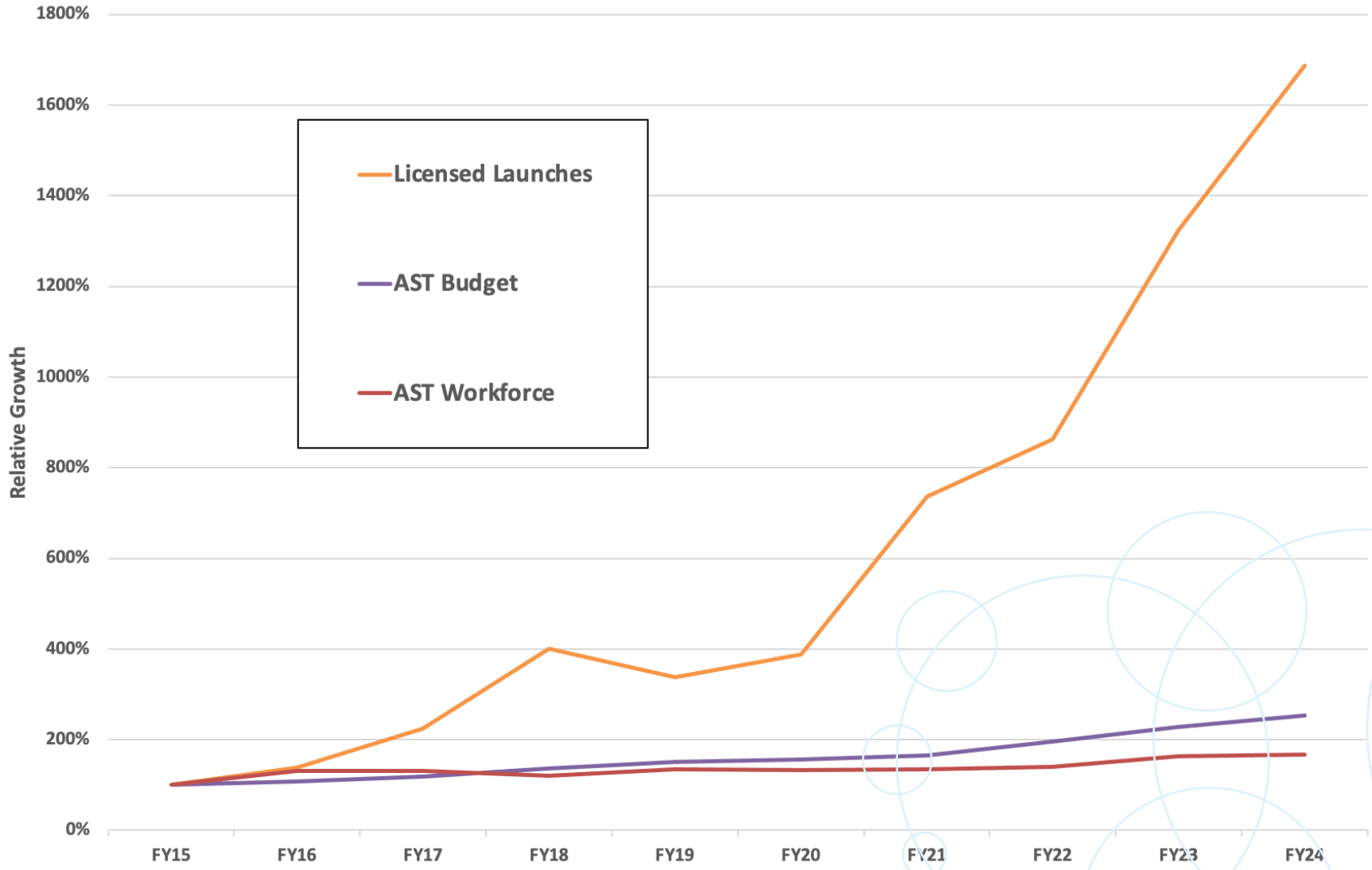
- UBS
  - In 10 years: $805 Billion
  - In 20 years: $1 Trillion
- Morgan Stanley
  - By 2040: $1.1 Trillion
- Bank of America Merrill Lynch
  - By 2045: $2.7 Trillion

Is it Time for a Change?

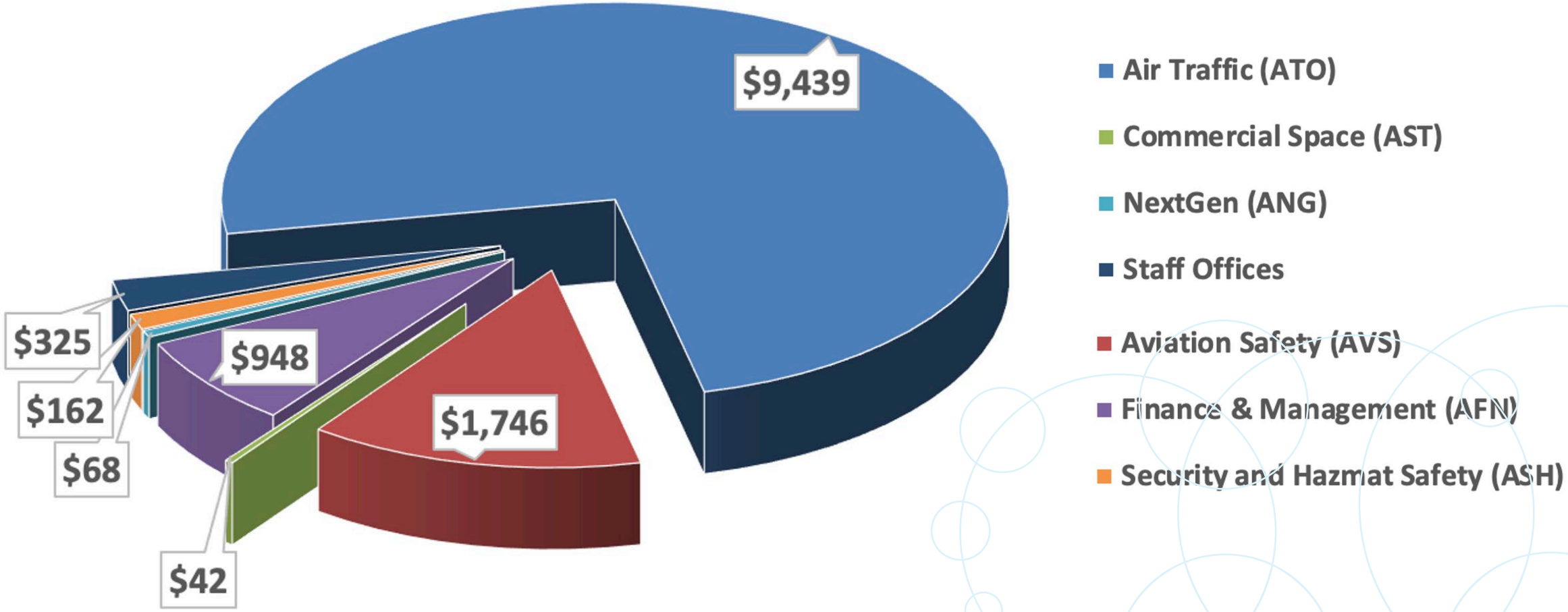
As part of the FAA, the Office of Commercial Space Transportation has not always received the needed:

- Time and attention from senior leadership
- Resources to successfully carry out the mission
- Advocacy and support in resolving key issues in a timely manner

Growth in Licensed Launches vs AST Resources

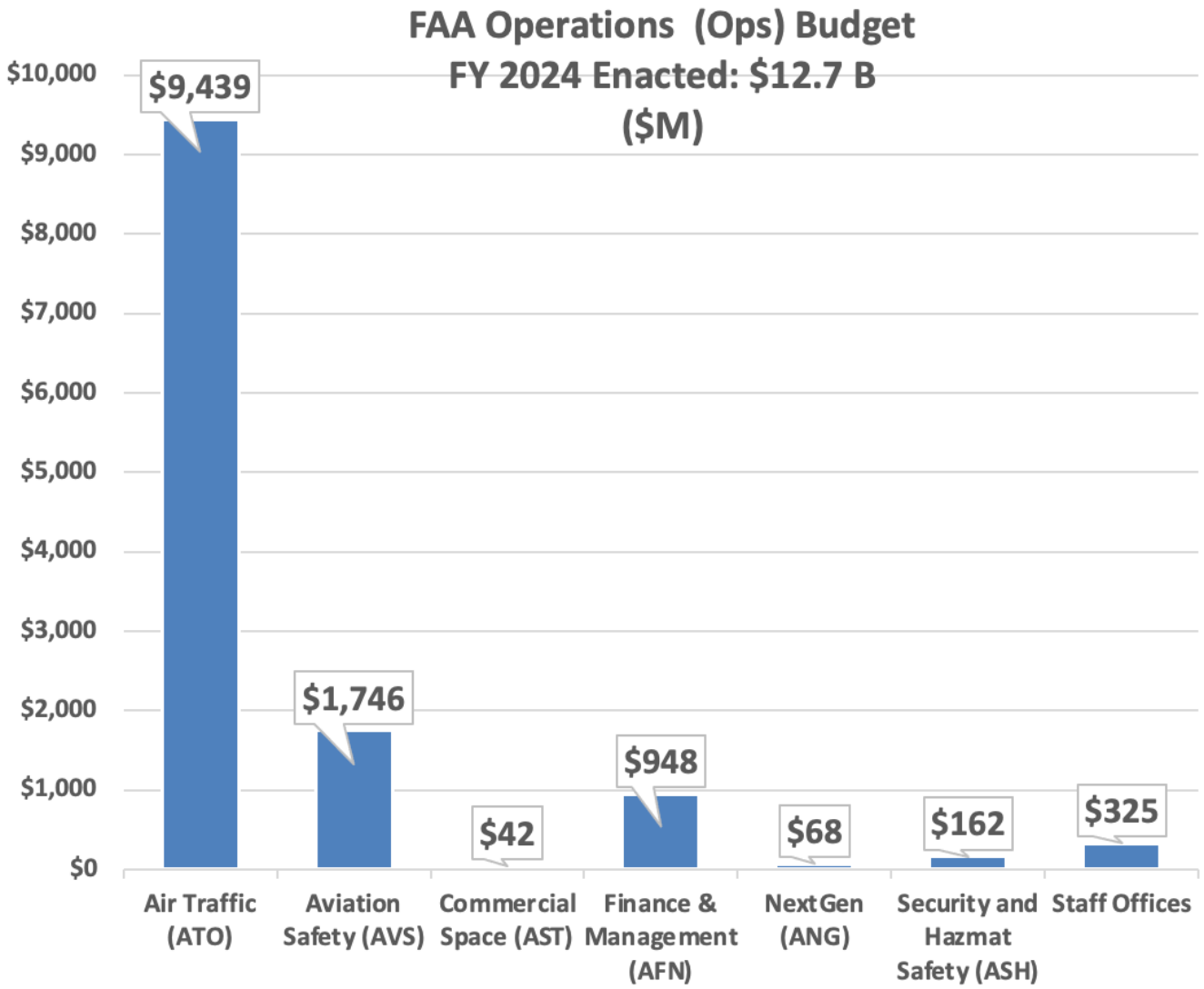


FAA Operatons (Ops) Budget – FY2024 Enacted: $12.7 B ($M)



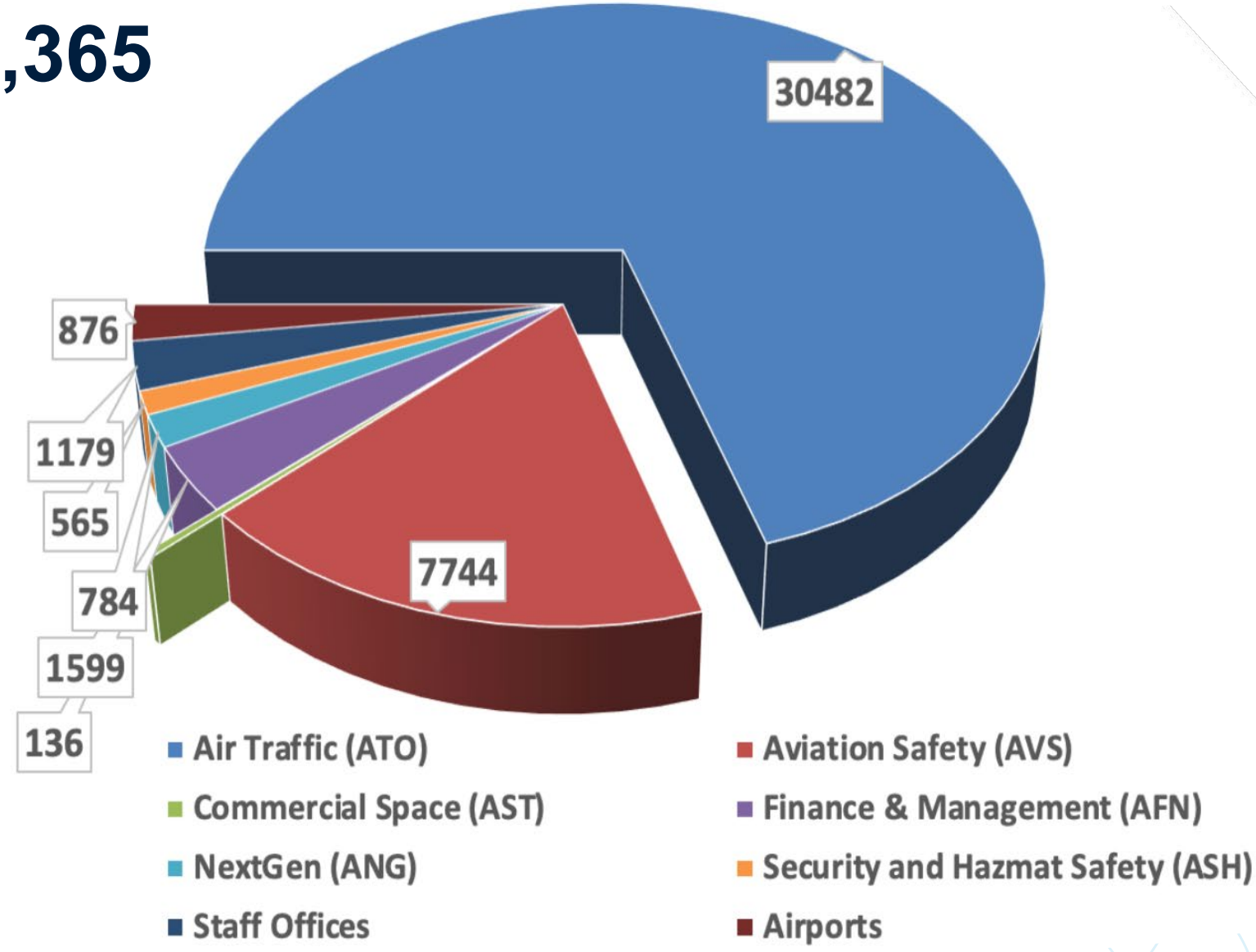
Federal Aviation Administration

FAA Ops Budget – FY2024

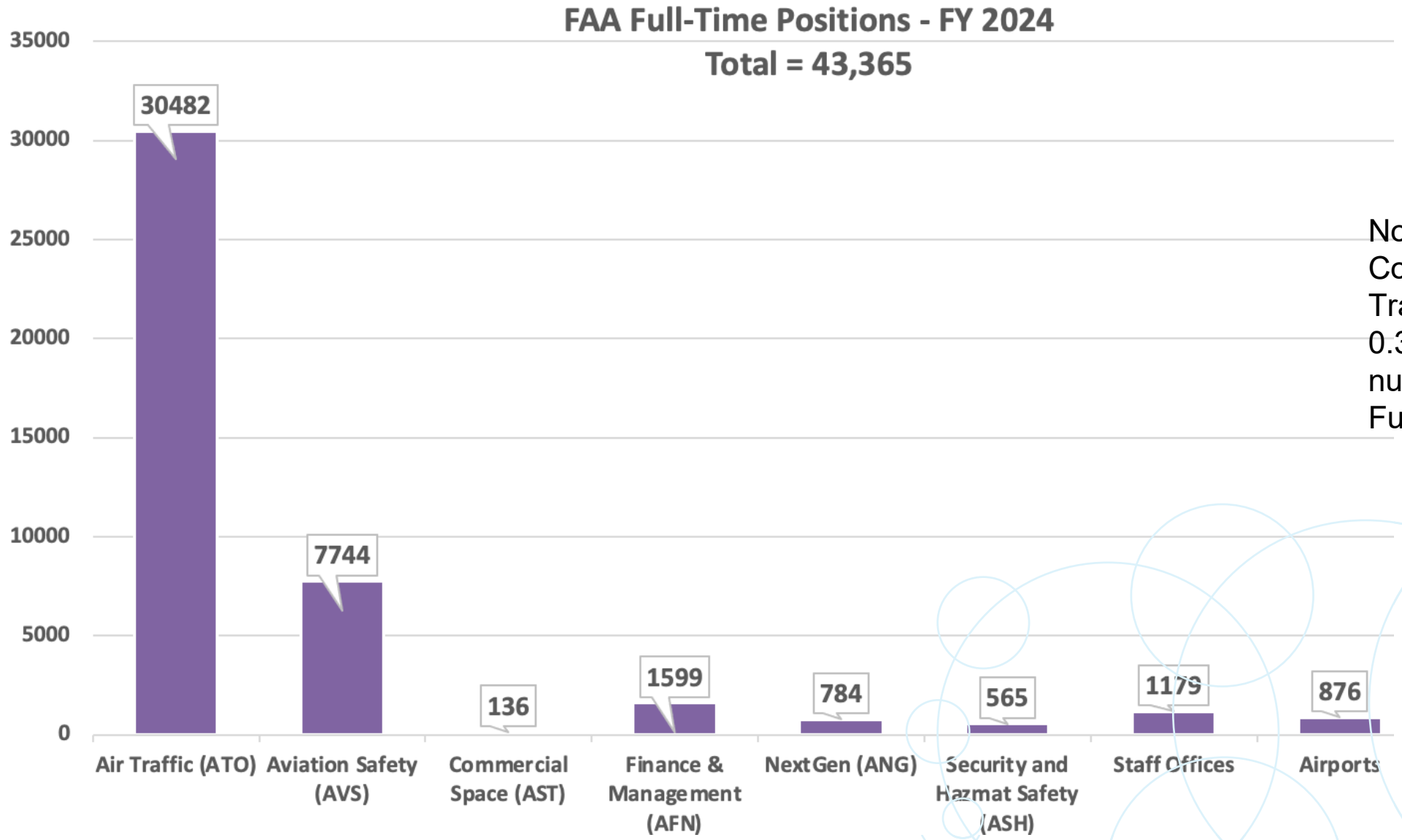


Note: The Office of Commercial Space Transportation receives 0.35% of the total FAA Ops Budget

FAA Full-Time Positions – FY 2024
Total = 43,365



FAA Full-Time Positions – FY 2024



Note: The Office of Commercial Space Transportation has 0.31% of the total number of FAA Full-Time Positions

Federal Aviation Administration

The Limited Resources are a Concern, Given How Important Space Has Become for the Nation!

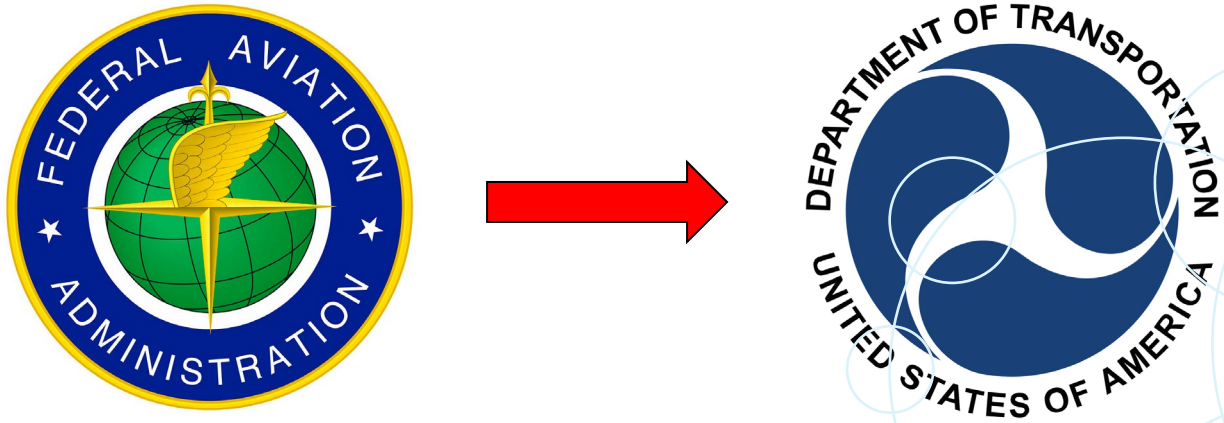
- National Security
- Technological Leadership
- International Competitiveness
- Inspiration for Students

We Also Count on Space for Our Everyday Activities

- Communication
- Navigation
- Financial Transactions
- Weather Forecasts
- Agriculture
- Entertainment

How Could We Address the Lack of Support?

- Formally recognize Commercial Spaceflight as an independent operating administration by moving the Office of Commercial Space Transportation back to DOT.

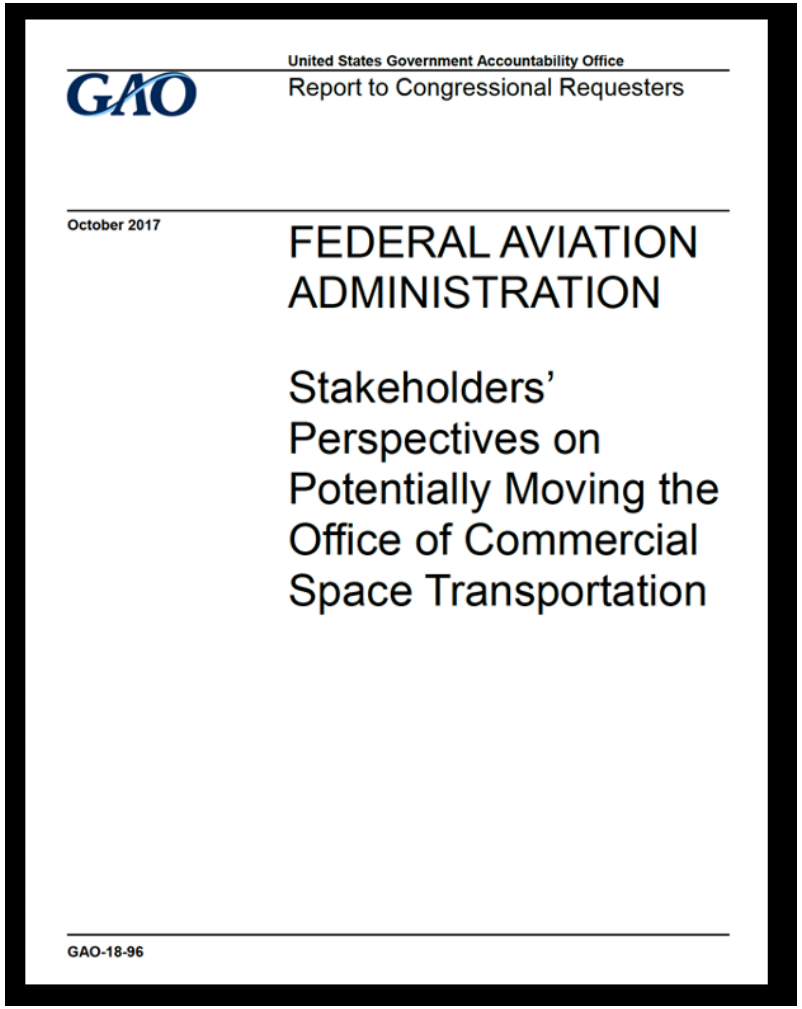


Why Should Commercial Space Transportation Be Independent of the FAA?

Space and Aviation are Different!

- The vehicles are different
- The environment is different
- The regulatory framework is different
- The risk level is different, and it is managed differently
- The pace of industry activity is different

GAO Report on Moving AST to DOT


United States Government Accountability Office

GAO

Report to Congressional Requesters

October 2017

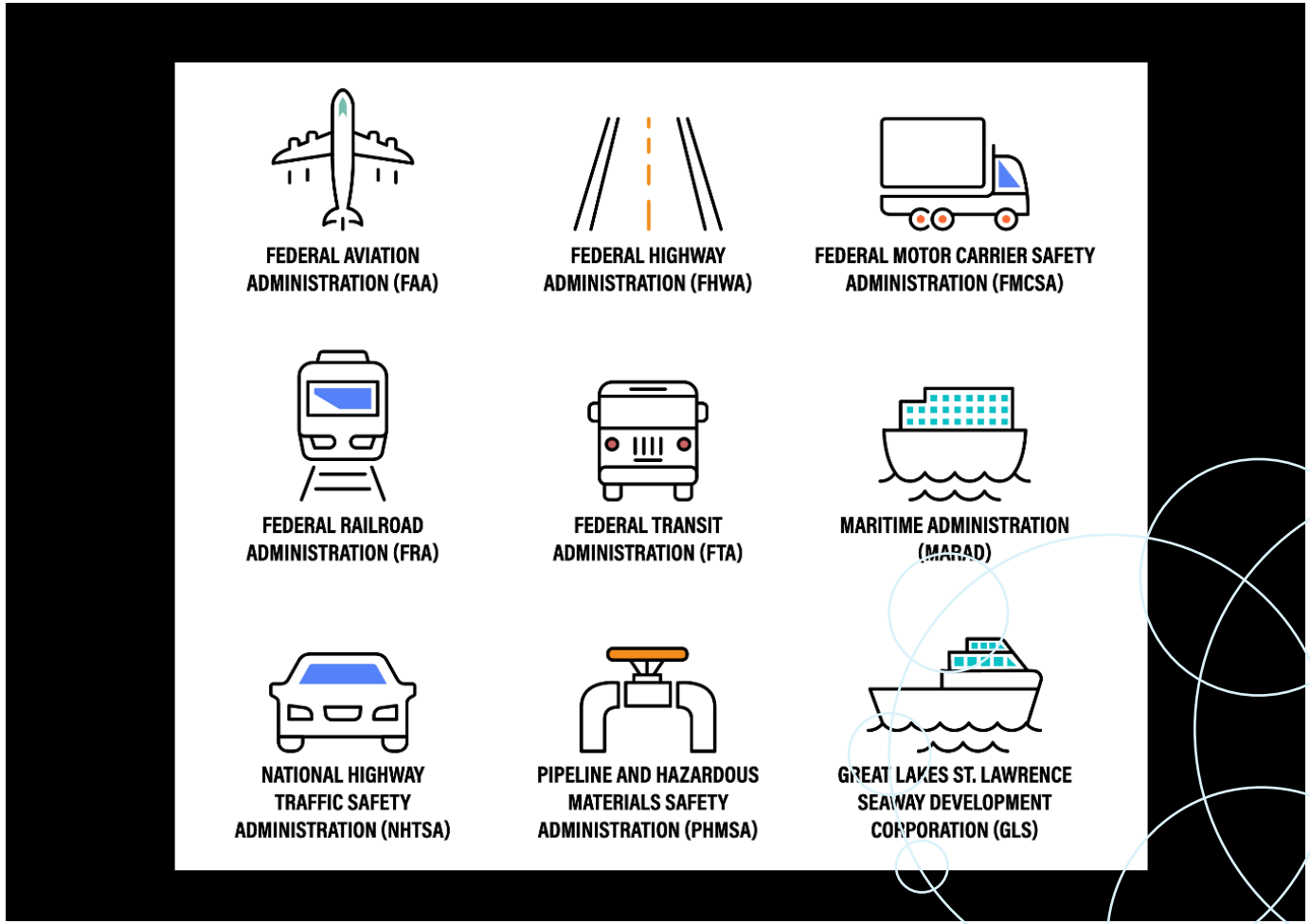
FEDERAL AVIATION ADMINISTRATION

Stakeholders' Perspectives on Potentially Moving the Office of Commercial Space Transportation

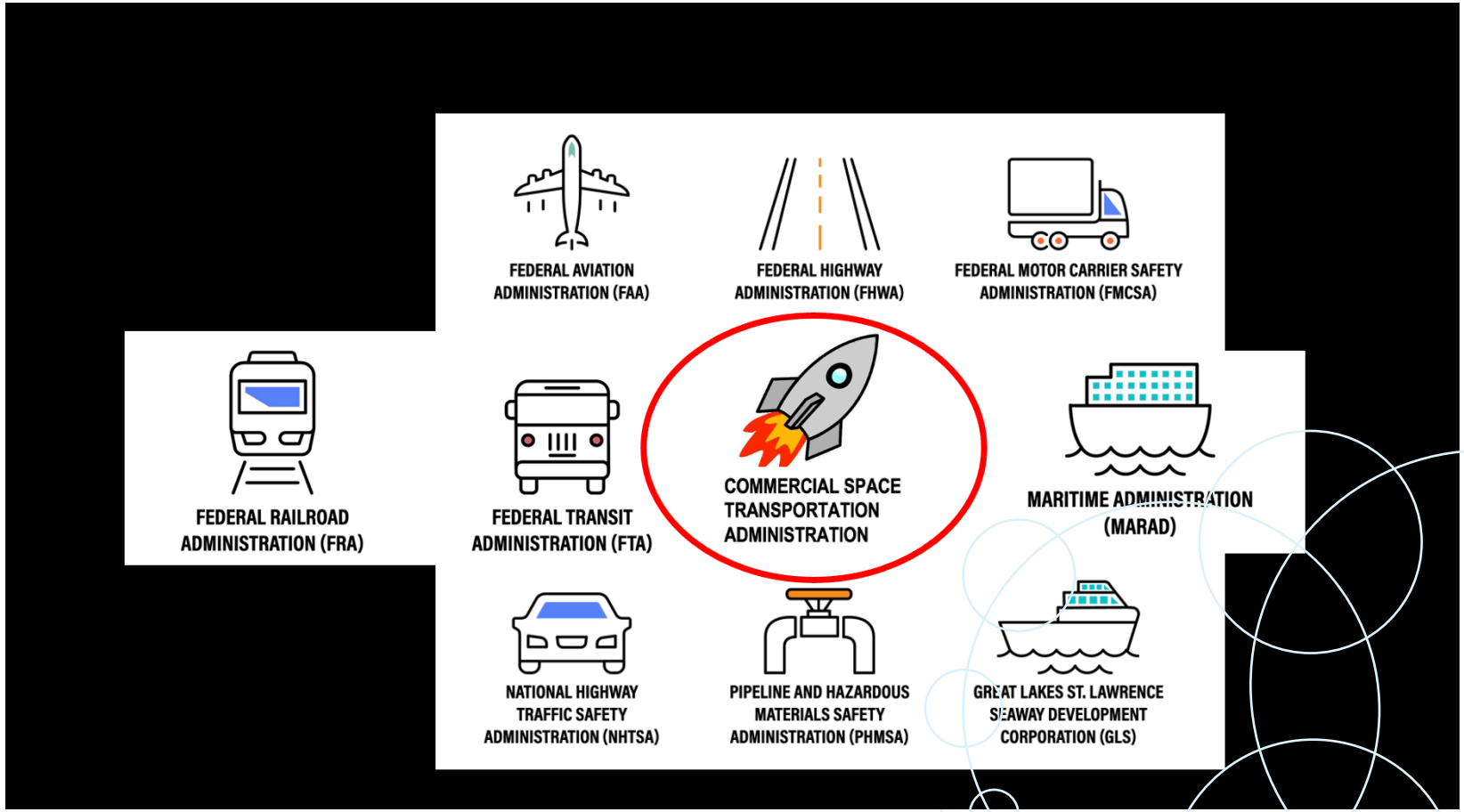
GAO-18-96

- Most commercial space launch companies and spaceports favored moving the office; most FAA officials did not.
- Report noted that DOT Secretary can move the office through a delegation of responsibilities, as was done in 1995.

U.S. Department of Transportation Organizational Structure (Current)



U.S. Department of Transportation Organizational Structure (Proposed)



Expected Benefits

Formally recognizing commercial spaceflight as an independent operating administration within the Department of Transportation would help government to keep pace with industry by:

- Identifying and resolving key issues in a timely fashion
- Streamlining communications with stakeholders
- Maintaining a “light touch” regulatory framework that will ensure public safety while still allowing innovation
- Expediting needed changes to laws, policies, and regulations
- Allowing consideration of the case for additional resources

Recommendation 2

- Recognize Commercial Spaceflight as an independent operating administration by moving the Office of Commercial Space Transportation out from under the FAA and having it report directly to the Secretary of Transportation.

Questions?

Break

AST Updates to COMSTAC

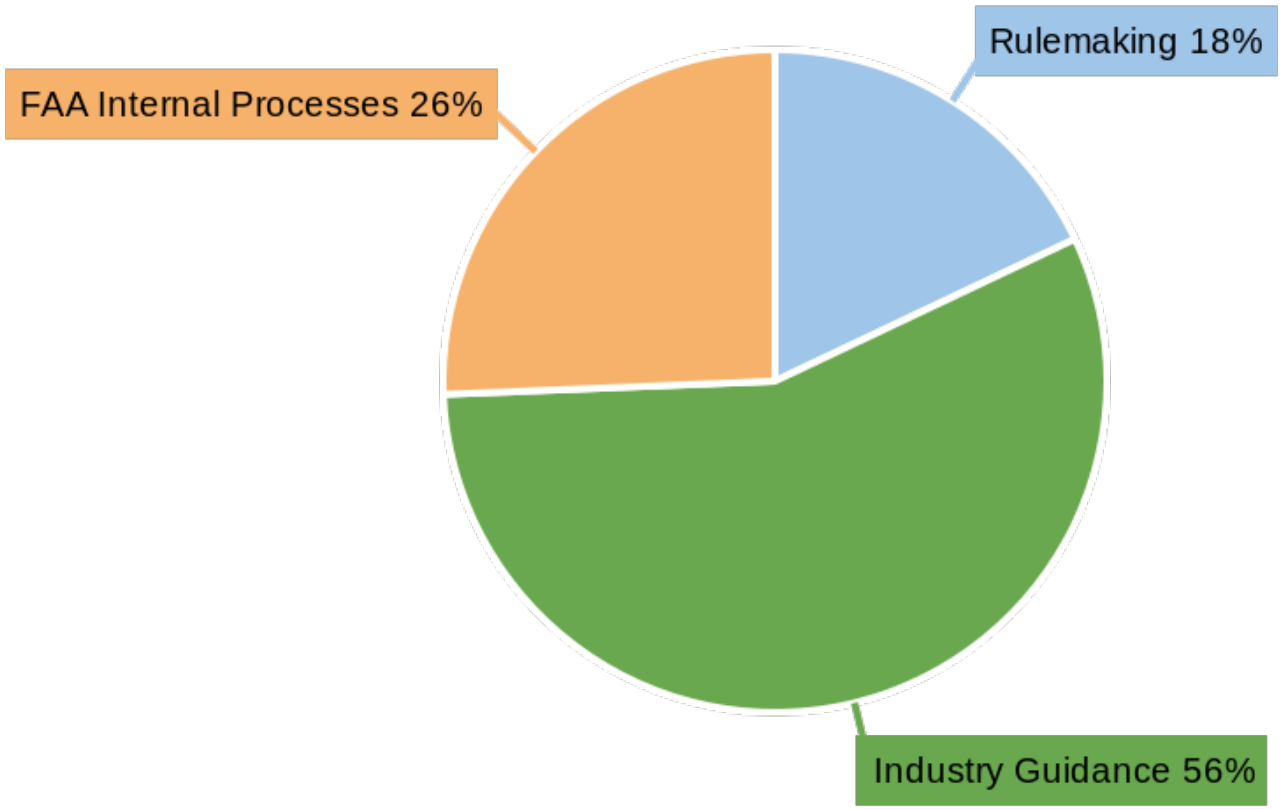
Randy Repcheck

Deputy Director, Office of Strategic Management

Office of Commercial Space Transportation

COMSTAC Recommendations Overview

FAA Categories 2018-Present



Recommendation Status 2018-Present

- 72% In Progress
- 23% Implemented
- 5% Not Implemented

Recommendation and Response

Recommendation	Response
Establish a mechanism for industry inputs into the DOT-related tasks of the Interagency Roadmap to Support Space-Related STEM Education and Workforce. Establish workforce development officers to build STEM workforce pipelines including regional postsecondary STEM internship programs.	FAA/AST will work through COMSTAC and direct industry outreach to get input into DOT-related tasks of the Interagency roadmap to Support Space Related STEM work. AST's Space Policy Division will establish more options to support tasks as they are established. FAA/AST leverages the FAA's STEM Aviation and Space Education program including involvement of multiple outreach representatives from AST to provide strong local and regional STEM outreach activities. AST is currently hosting multiple interns through the OPM Pathways program. FAA/AST have established an AST STEM team that specifically develops STEM Space Related activities and FAA/AST has established its first partnership with a local school implementing STEM Fridays into the curriculum. Additionally, FAA/AST is an active member of the White House Sub-Interagency Space Policy Committee on STEM and Workforce Initiatives.

Recommendation and Response

Recommendation	Response
Highlight space industry jobs available and identify academic and extracurricular points of engagement within FAA AST.	FAA/AST participates in many STEM activities every year at middle and high schools and universities to raise awareness of the various career opportunities in the aerospace industry reaching over 700 students annually.
Extend the Department of Labor's Space-focused Apprenticeship Accelerator model to not only promote areas of research interest to FAA AST, but to also support the space industry's workforce pipeline directly, emphasizing the employment of historically excluded communities in commercial space transportation.	FAA/AST has established its first partnership with a local middle school incorporating monthly STEM Fridays into their curriculum. This is the first of additional direct school partnerships. FAA/AST joined the FAA White House HBCU Consortium and participates in the White House HBCU Interagency Week. FAA/AST partnered with the Department of Education, along with other governmental agencies, and participated in the first ever National STEM Festival. Due to limited personnel resources, FAA/AST has not implemented this recommendation. AST will work with the STEM AVSED office to determine how we could implement this program.

Recommendation and Response

Recommendation	Response
FAA should conduct a voluntary, non-attributable survey to assess the implementation of developed voluntary consensus standards.	FAA/AST is working with ASTM F47 and as standards are published, we will evaluate this type of survey.
The FAA should assess the completeness of standards to serve as a means of compliance and provide guidance on how it will review and accept standards as a means of compliance.	FAA/AST is currently updating its process to review a voluntary consensus standard and determine whether to accept it as a Means of Compliance. FAA/AST is updating the Means of Compliance table on our website and will include voluntary consensus standards as they become accepted as a means of compliance.

Recommendation and Response

Recommendation	Response
FAA/AST provide update on efforts to streamline licensing, range safety approvals and other processes.	FAA/AST building a part 450 SpARC charter to obtain industry recommendations on updating the rule. FAA/AST is drafting a policy on safety-related launch or reentry services provided by a Federal Entity. FAA/AST is developing an Interagency Agreement with NASA to address launches from NASA facilities. FAA is providing COMSTAC updates later today on our efforts to streamline licensing.
FAA/AST brief results from National Spaceport Interagency Working Group and solicit state and private spaceports' participation and feedback.	The NSIWG is working with the National Space Council and OMB to coordinate an inter-agency review of the recommendations in preparation for publication, and developing implementation plans in parallel. Office of Spaceports will be able to brief the results when the interagency review is complete.

Federal Aviation Administration

Recommendation and Response

Recommendation (Regulatory Working Group)	Response
The FAA should clarify and as needed amend Part 450 to address challenges with requirements that are distinct to launch or reentry. The FAA should prioritize Part 450 clarification through guidance and policy balanced with reforms.	FAA/AST building a part 450 SpARC charter to obtain industry recommendations on updating the rule. This will allow us to gather detailed industry feedback on changes and updates that are needed to provide a better streamlined licensing process while maintaining the focus on public safety. As of 10 April, there are a total of 19 ACs published on the FAA/AST website with 12 more being actively worked.

Recommendation and Response

Recommendation (July 2023)	Response
FAA Processes: • The FAA should develop and implement a change control process for technical standards. That process should account for the impact of changing technical standards during an ongoing licensing effort.	FAA/AST is implementing a process to address cases where it has implemented a change to what was previously accepted or applied a new standard. We will implement a change based on two core principles: 1. The information/change if not implemented would result in risk substantially higher than the 450.101 risk criteria, and 2. There must be something in place to readily implement the new information or change.

Recommendation and Response

Recommendation (July 2023)	Response
Rule Changes:	
• The FAA should prioritize Part 450 clarification and reforms to ensure that it is prepared to efficiently and effectively manage an increasing number of applicants and existing licenses transitioning from existing licenses to Part 450.	We are forming a Part 450 SpARC followed by a rulemaking.
• The current definition of payload is not appropriately bounded for suborbital flights. Recommend the FAA adopt different payload classes to facilitate streamlined approval. (§ 450.43)	The current part 450 rule allows for different payload classes.
• The FAA should revise Part 450 to address challenges with requirements that are distinct to launch or reentry. (§ 450.101 (c), 450.121, and 450.131)	We are forming a Part 450 SpARC followed by a rulemaking.
• The FAA's approach to reviewing and accepting flight safety analysis (FSA) methodologies has been inconsistent in § 450.115(c))	FAA/AST has implemented an internal review process to better ensure consistency. AC 450.115-2 (FSA Methodology Rigor) is also in development.
• The reference to "anomaly" in § 450.215(b)(2) is not appropriately defined.	We are forming a Part 450 SpARC followed by a rulemaking.

Federal Aviation Administration

Recommendation and Response

Recommendation (July 2023)	Response
Industry Guidance:	
• Provide for clear timeframes for FAA's initial application review and determination of the "complete enough" review. The recommendation is within 10 business days of submission.	On Dec. 18, 2023 FAA published AC 413.13-1 "Guide to Complete Enough and Complete Application for a Vehicle Operator License."
• ACs should distinguish between launch vs. reentry license requirements, where differences exist, or at least include distinct sections discussing the difference in applicability of many of the regulations.	CEc is the primary issue that has been identified by industry, and is in work.
• FAA should ensure that it can provide guidance to launch vehicle operators on efficiently and effectively implementing CEc.	FAA recently updated AC 450.101-1 High Consequence Event Protection.
• The new 450 system safety framework should have clear success metrics: if a company meets X quantitative, agreed-upon goal(s) then it will have met the system safety requirement of Part 450.	Agree. This will be a significant topic for the Part 450 SpARC.

Recommendation and Response

Recommendation (July 2023)	Response
Industry Guidance (cont.):	
• Ensure that Advisory Circulars are accurate and accommodate variations in vehicle complexity and prevent regulatory burdens with no public safety benefit.	During AC development, FAA/AST ensures accuracy and accommodates variations in vehicle complexity and will continue to do so.
• The FAA should provide more transparency into the software and analysis tools that have been accepted for use.	FAA/AST continues to investigate a means to provide more transparency to the industry. Safety Element Approvals is FAA/AST's primary tool for accepting safety components.
• The FAA should clarify the use of "benchmark" in 450.115 through an update to AC 450.115-1	AC 450.115 is being updated to provide clarity.

Recommendation and Response

Recommendation (July 2023)	Response
Industry Guidance (cont.): • Clarify AC 450.123-1 (Population Exposure Analysis) and ensure consistent understanding and application of the guidance by the FAA. • The FAA has interpreted section 450.108 to require a highly reliable flight safety system for the entire time it is active, not just during the period when it is required to protect the public. The FAA should clarify that the "highly reliable" requirement is related to public safety.	FAA/AST has implemented an internal review process to better ensure consistency. We will update AC 450.123-1 if necessary to provide clarity. FAA/AST believes this comment is based on a unique scenario.

AC and Policy Updates

Randy Repcheck
Deputy Director, Office of Strategic Management
Office of Commercial Space Transportation

Current Advisory Circulars

1. AC 450.117-1 Trajectory Analysis for Normal Flight
2. AC 450.101-1B High Consequence Event Protection*
3. AC 450.103-1 Safety System Program
4. AC 450.107-1 Hazard Control Strategies
5. AC 450.108-1 Flight Abort Rule Development
6. AC 450.109-1 Flight Hazard Analysis
7. AC 450.110-1 Physical Containment as a Hazard Control Strategy
8. AC 450.115-1A High Fidelity Flight Safety Analysis
9. AC 450.123-1 Population Exposure Analysis
10. AC 450.141-1A Computing Systems and Software
11. AC 450.161-1 Control of Hazard Areas
12. AC 450.167-1 Tracking for Launch and Reentry Safety Analysis
13. AC 450.169-1 Launch and Reentry Collision Avoidance Analysis
14. AC 450.173-1 Mishap Plan – Reporting, Response, and Investigation Requirements
15. AC 450.179-1 Ground Safety
16. AC 450.3-1 Definition of Launch and Scope of a Vehicle Operator License
17. AC 450.31-1 Applying for FAA Determination on Policy or Payload Reviews
18. AC 450.45-1 Launch and Reentry of Space Nuclear Systems
19. AC 413.13-1 Guidance on a Complete Enough and Complete Application*

*Denotes a change from Nov. 8th meeting

Upcoming Advisory Circulars

1.	AC 450.139-1	De Minimus Toxic Hazard
2.	AC 450.137-2	De Minimus FFBO Hazard
3.	AC 450.143-2	Safety Critical Systems non-FSS
4.	AC 450.121-1	Causes of Breakup
5.	AC 460.45-1	Informed Consent (Human Space Flight)
6.	AC 450.117-1A	Normal Trajectory Analysis (REVISION)
7.	AC 450.115-2	FSA Methodology Rigor
8.	AC 413.5-1	Pre-Application Consultation
9.	AC 460.15-1	Human Factors HSF
10.	AC 450.161-1A	Control of Hazard Areas (REVISION)
11.	AC 450.133-1	Airspace and Waterborne Vessel Hazard Areas
12.	AC 450.131-1	Probability of Failure

Additional Advisory Circulars

1.	AC 450.135-1	Debris Risk Metrics
2.	AC 450.137-1	FFBO Analysis
3.	AC 450.121-1	Inert Debris
4.	AC 450-119-1	Malfunction Trajectory Analysis
5.	AC 450.121-1	Yield from Propellant/Tank Impacts
6.	AC 450.113-1	Flight Safety Analysis: Levels of Fidelity
7.	AC TBD	Hybrid Vehicles
8.	AC 450.135-2	Consequence Modeling
9.	AC 450.121-2	Debris Risk Propagation
10.	AC 450.110-1	Physical Containment as a Hazard Control Strategy
11.	AC 450.139-1	Toxic Hazards Analysis and Thresholds
12.	AC 450.123-1A	Population Exposure (REVISION)
13.	AC 450-121-1	Structural Analysis for High Fidelity Flight Safety Analysis
14.	AC 450.115-1A	High Fidelity Flight Safety Analysis (REVISION)
15.	AC 450.115-TBD	Medium Fidelity Flight Safety Analysis
16.	AC 450.143-1	Safety Critical Systems
17.	AC R 450.107-1	Hazard Control Strategies Determination

Hosted Payload Clarification

- March 14, 2024 – FAA published in the Federal Register policy clarifying that the FAA will require that applicants for a payload determination under parts 415, 431, 435, or 450 provide a complete manifest of all payload contents and compositions, including those of all ***hosted*** payloads.

Reentry License Rule Implementation

- April 17, 2024 - FAA published in the Federal Register clarification on how the FAA implements launch vehicle operator payload review requirements related to the launch of a reentry vehicle.
- FAA requires reentry vehicle license applicants to have a favorable license determination prior to being a payload on an FAA licensed launch vehicle.

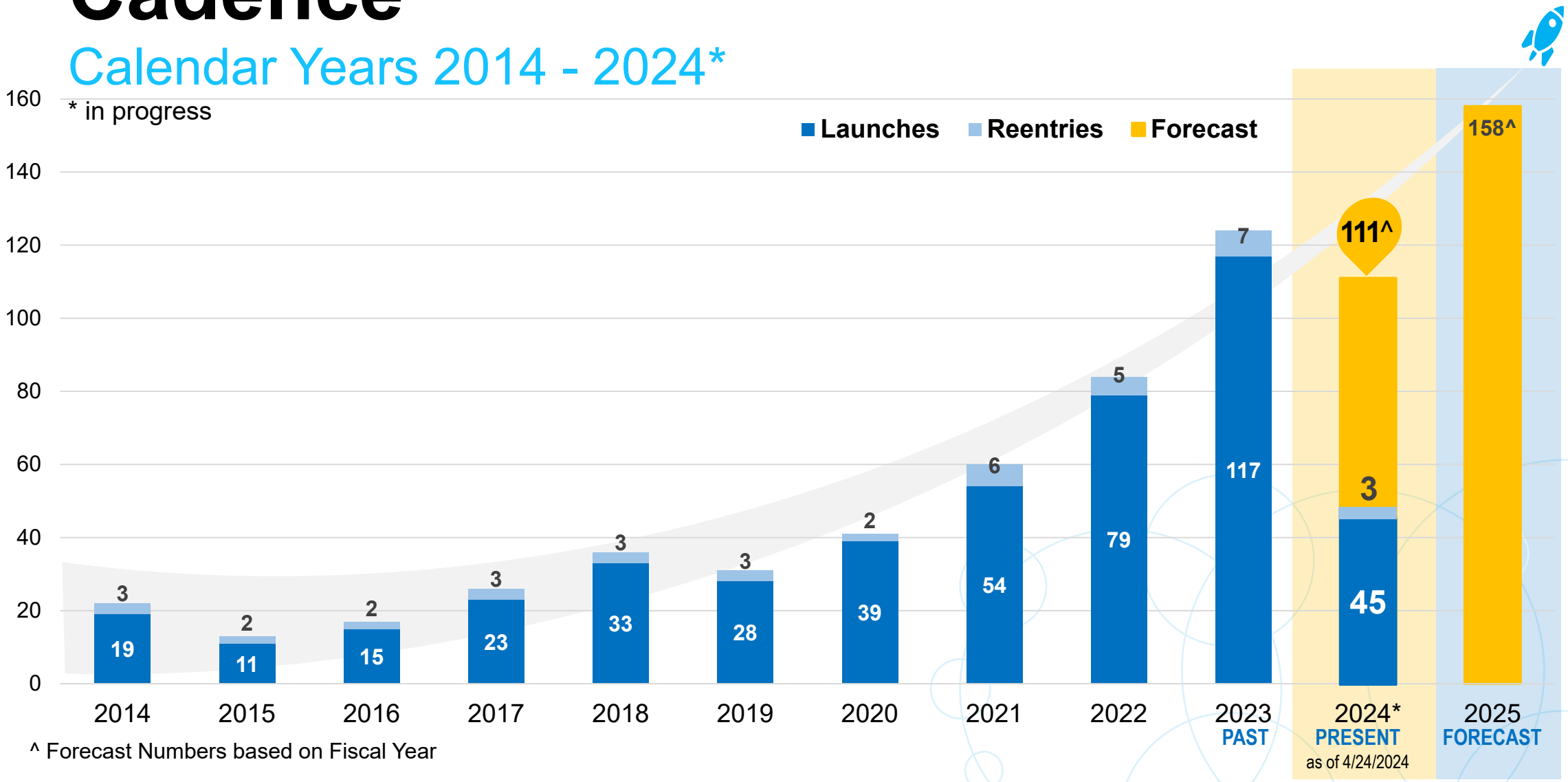
Federal Aviation Administration

Future of Licensing

Dan Murray
Executive Director, Office of Operational Safety
Office of Commercial Space Transportation

Cadence

Calendar Years 2014 - 2024*



^ Forecast Numbers based on Fiscal Year

Federal Aviation Administration

AST CY 2023 Highlights

124 (48%↑)
Total Operations

117 (48%↑)
Launches

7 (40%↑)
Re-entries

9 (50%↑)
Human Spaceflight Missions

48 (60%↑)
Individuals Launched into Space

51 (28%↑)
New Licenses & License Modifications

16 (33%↑)
Environmental Reviews

116 **International Engagements** (27%↑)

783 (27%↑)
Inspections

7 (75%↑)
Mishaps

Federal Aviation Administration

Enabling Safe Space Transportation

Maintaining our public safety record, but not resting on it

Ensuring compliance with all applicable environmental laws, regulations, and policies

Meeting industry demand

Increased consideration for the role that Commercial Space Transportation plays in the national interest and U.S. global leadership

Key Initiatives for 2024 and Beyond

Staffing

Continue to hire to authorized levels

New methods of recruitment

Part 450 Optimization

Publish Advisory Circulars (ACs) and update rule based upon what we have learned

Educate Industry

Expand workshops and “office hours”

Self-guided preapplication consultation

Increase use of Automation in All Phases of Licensing

Implementing automation through the License Electronic Application Portal (LEAP) Tool

Safety Management System (SMS) for Licensing

Expand use of risk-based safety oversight

Evolve safety oversight approach

Enhance Processes

Clarify and improve policies and processes for application acceptance, denial, toll, and other actions

Partner with Federally Funded Research and Development Centers (FFRDCs)

Pursue select recommendations designed to leverage proven best practices

Public Comment

Proposed Fall 2024 Meeting and Taskers

Fall 2024 Meeting: Propose COMSTAC Fall meeting to occur either week of September 16 or 23, in Washington, D.C.

Fall 2024 Taskers:

Regulatory Working Group:

Safety Working Group:

Proposed Fall 2024 Meeting and Taskers

Research & Development Working Group:

Innovation & Infrastructure Working Group:

Closing Remarks