Agency Priority Goal Action Plan

Commercial Low Earth Orbit Economy

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Overview

Goal Statement

- Enable a robust commercial low Earth orbit economy in which transportation, habitation, and on-orbit services are available for purchase by NASA and other customers. By September 30, 2021, NASA will support the development of commercial services, including through releasing new business opportunities, supporting demonstration flights, beginning certification activities, and demonstrating commercial capabilities.

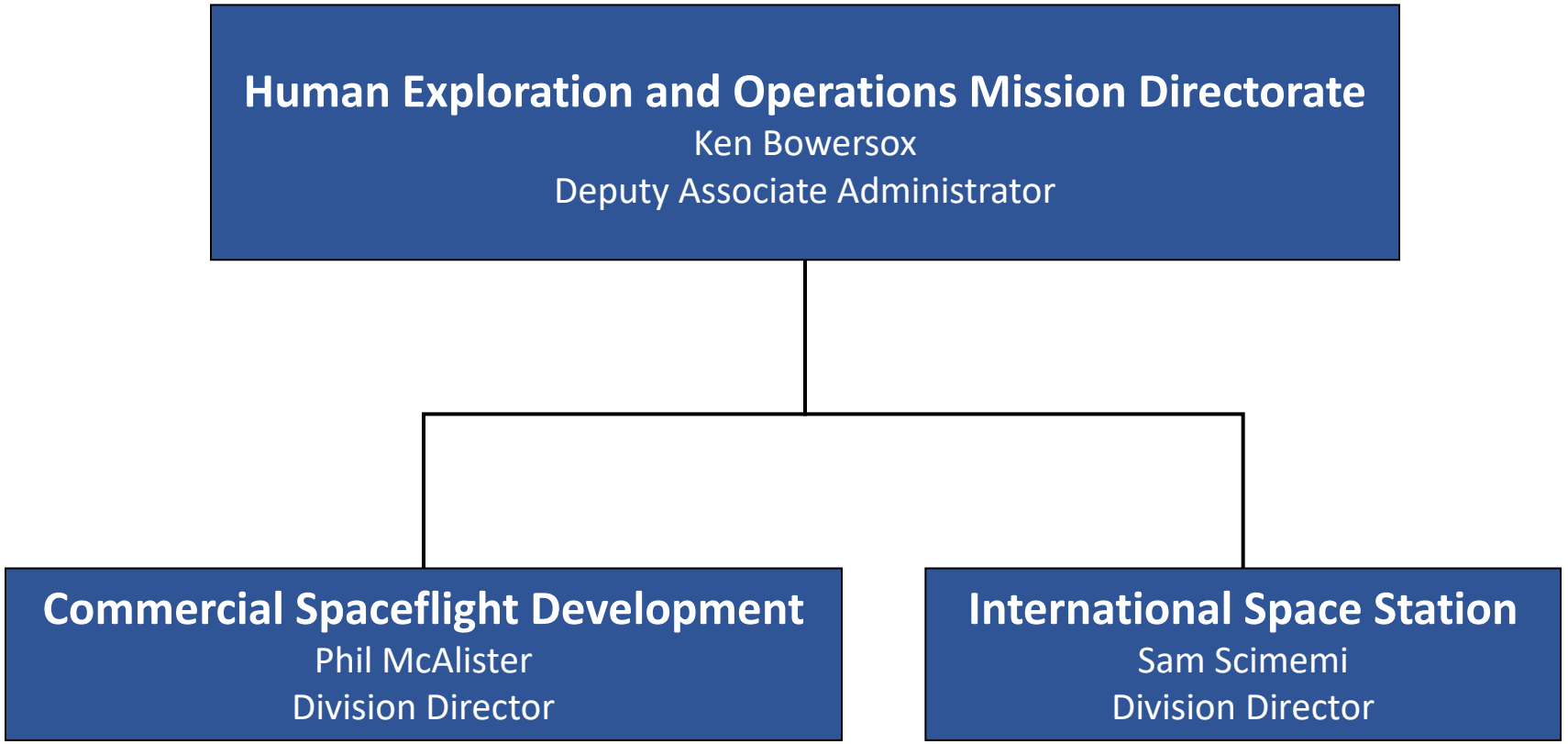
Challenge

- Achieving safe, reliable, and cost-effective access to and from low Earth orbit and the ISS through the development of U.S. commercial crew space transportation capabilities. Partnering with industry to develop commercial destinations that will enable transition from the ISS, while stimulating growth of sustainable demand so NASA can be one of many customers.

Opportunity

- Enabling a U.S. industry-based capability can facilitate growth of a commercial market, providing new high-technology jobs, securing U.S. leadership, and reducing the cost of human access to and operations in space.
- Further opening the frontier for space exploration will support a robust economy in low-Earth orbit.

Leadership & Implementation Team



Goal Structure & Strategies

- Enable crew and cargo transportation capabilities that support establishment of a Commercial LEO economy.
- Support establishment of commercial LEO transportation systems and destinations for use by future customers, including industry, other US government agencies, other National and the general public.
- Partner with industry to support growth of sustainable demand for products and services in the LEO economy.
- Contributing Programs include NASA's Commercial Crew Program, Commercial LEO Development, and the International Space Station Program.

Summary of Progress – FY20 Q1

- A key milestone in the NASA Commercial Crew Program occurred in Q1 when the uncrewed Boeing Starliner spacecraft launched on December 20, 2019, from Florida on a flight test to the International Space Station (ISS). While the Starliner did not reach the planned orbit and did not dock to the ISS, the spacecraft completed the first land touchdown of a human-rated capsule in U.S. history on December 22, 2019, at White Sands Space Harbor in New Mexico, a key demonstration of the Boeing uncrewed Orbital Flight Test.
- NASA made a selection for award of NextStep 2 Broad Agency Announcement (Appendix I), with the announcement of the award expected in early Q2.
- Throughout Q1, NASA developed and refined the final draft of the Request for Proposal (RFP) for the free-flyer solicitation – NextStep 2 Broad Agency Announcement (Appendix K). Release of the RFP is expected in Q2, with anticipated award by the end of FY 2020.
- In Q1, NASA signed a reimbursable Space Act Agreement with a commercial company that will provide astronaut training for private astronaut missions. Training is expected to begin in FY20 Q2.
- NASA and SpaceX prepared for a launch escape demonstration of the SpaceX Crew Dragon spacecraft and Falcon 9 rocket in early Q2. This will be the final major flight test of the spacecraft before it begins carrying astronauts to the ISS under NASA's Commercial Crew Program.

Summary of Progress – FY20 Q2

- NASA awarded a contract to Axiom Space in early Q2 for demonstration of a commercial module attached to the Node 2 forward port of the International Space Station (ISS) via NextStep 2 Broad Agency Announcement (Appendix I), https://www.nasa.gov/press-release/nasa-selects-first-commercial-destination-module-for-international-space-station.
- Following the orbital flight test of the uncrewed Boeing Starliner spacecraft launched on December 20, 2019, Boeing and NASA will decide whether to fly a second uncrewed flight test as a part of NASA's Commercial Crew Program. As required, NASA will review Boeing's proposal to fly the mission again and will work side-by-side with Boeing to resume flight tests to the ISS on the company's CST-100 Starliner system.
- In Q2, NASA selected eight awards to stimulate demand under the ISS Utilization NRA and NextStep 2 BAA Appendix J. The awards are designed to help the selected companies raise the technological readiness level of their products and move them to market, enabling U.S. industry to develop sustainable, scalable, and profitable non-NASA demand for services and products in low-Earth orbit. https://www.nasa.gov/leo-economy/nasa-selects-for-projects-optical-fibers-stem-cells-enable-low-earth-orbit-economy
- NASA and SpaceX completed a launch escape demonstration of the company's Crew Dragon spacecraft and Falcon 9 rocket on January 19, 2020. NASA is preparing for an a Q3 launch by SpaceX where the Crew Dragon will transport astronauts to the ISS.
- NASA's COVID-19 response framework was implemented in mid-March, and the impacts Agency-wide at both government and contractor facilities in Q2 are not distinguishable from the actions that were delayed throughout the first half of Q3. More insight will be available later in the FY.

Key Milestones

Progress update for the Commercial LEO Economy APG.

	N/A	FY 2020 Q1	Current Status FY2020 Q2	Forecast FY2020 Q3
Quarterly Rating		Yellow	Yellow	⇧
Milestones Achieved		0 out of 1	1 out of 2	

⇨ Unchanged ⇧ Improving ⇩ Deteriorating

Milestone Summary		
Milestones	**Milestone Due Date**	**Comments**
Make awards for the port solicitation – NextStep 2 Broad Agency Announcement (Appendix I).	FY 2020 Q1	Completed in January 2020
Make awards for the free-flyer solicitation – NextStep 2 Broad Agency Announcement (Appendix K)	FY 2020 Q2	In Q2, additional information was requested and the RFP release was delayed until Q4.
Initiate astronaut training for initial private astronaut mission under a reimbursable space act agreement	FY 2020 Q3	
Both commercial crew industry partners complete demonstration missions	FY 2020 Q4	
Execute an outreach and communication campaign to expand pipeline of new entrants into the LEO economy	FY 2021 Q1	
Complete Preliminary Design Review for at least one port solicitation awardee	FY 2021 Q2	
Complete Preliminary Design Review for at least one free-flyer solicitation awardee	FY 2021 Q3	
Commence regular commercial crew operations	FY 2021 Q4	

Data Accuracy and Reliability

Verification and Validation:

- NASA monitors and tracks its progress towards this goal using various Agency documents and reports, including Directorate Program Management Council (DPMC) materials, reports from the industry partners, and other program-internal documents.

Data Source(s):

- Email(s), press releases, and program-internal documents indicating that NASA's industry partners continue to make progress maturing their transportation system technical and certification/verification efforts, including Baseline Performance Reviews.

Level of Accuracy Required for Intended Use:

- Using the documents and reports referenced above, the Agency is able to accurately report at the end of each quarter on whether or not it has met its planned milestones.

Data Limitations:

- Materials provided by NASA's industry partners may include company-proprietary information. Data are sufficiently accurate for their intended use.

How the Agency Compensates for Data Limitations:

- NASA has not identified any data limitations that would preclude it from reporting accurate, reliable, and timely performance information.

Additional Information

Contributing Programs

NASA Program Activities:

- Commercial Crew Program: Facilitates the development of safe, reliable, and cost-effective human space transportation by the U.S. commercial industry to and from low Earth orbit and the International Space Station (ISS).
- ISS Program: Develops and maintains the transportation service, interface, and safety requirements associated with crewed flights to and from the ISS.
- Launch Services Program (LSP): Manages NASA's launch vehicle services, dedicated to launching all types of science and operational spacecraft.
- Commercial LEO Development: Partners with industry to support development of commercial LEO destinations and growth of sustainable demand leading to a robust economy in low-Earth orbit.

Other Federal Activities:

- Federal Aviation Administration (FAA), Office of Commercial Space Transportation: Ensures that commercially-developed, human-rated transportation systems meet FAA licensing requirements for launch and entry, and works with NASA on cross-agency licensing issues.
- United States Air Force, 45th Space Wing: Addresses launch range safety and crew rescue.
- Department of Commerce: Champion growth of space commerce.

Stakeholder/Congressional Consultations

NASA provides quarterly updates to Congress on the status of required milestones under the Commercial Crew Transportation Capability contracts, as well as through other contracts and partnerships. NASA also consults regularly with experts from industry and academia, such as the NASA Advisory Council.