



Mission Support Annual Report 2021



Message from Bob Gibbs

2021 was another year of unprecedented challenges, changes, and milestones. Despite unpredictable circumstances and unfamiliar ways of working, the mission support community continued to provide the services and infrastructure that are foundational to mission success. With the official end of the Mission Support Future Architecture Program (MAP), mission support now embarks on a new and uncharted course: continuous transformation and maturing the enterprise service delivery model. As we focus on our essential services, we renew our commitment to put our customers at the center of mission support strategies and transform our business to enable a new era of space exploration, scientific discovery, and aeronautics.

Your tremendous effort, dedication, and resilience in 2021 enabled NASA mission success:

- Without dependable technical, facilities, cyber, and HR services, NASA employees could not have continued working safely and productively during COVID.
- Without cybersecurity and licensing updates, NASA could not have defended against network penetration, phishing attempts, and other threats.
- Without legal and procurement services, NASA could not have secured contracts and acquisitions vital to the upcoming Artemis missions.
- Without our infrastructure management teams, NASA facilities, roadways, and utilities could have failed and threatened mission deadlines.
- Without use of NASA's direct hire authority, missions could not have obtained the talent needed to conduct vital work.
- Without our internal programs to increase inclusion or our engagement work with small businesses and marginalized populations, NASA would not have been recognized as a leader in diversity and inclusivity.
- Without our foundational services, the mission could not have been achieved.

In addition to providing the bedrock of services that supported these accomplishments, mission support tackled the challenges presented in 2021 in innovative, exciting ways. We enabled our employees with new technologies and processes. We embraced new ways of working with each other, connecting with our customers, and meeting mission needs. We shifted our culture toward a transformative organization that embraces change. Thanks to these changes and your willingness to continue improving service, the agency avoided costs and found new efficiencies that have allowed us to maintain service despite constraints.

With so many notable achievements, I asked for this Annual Report as a way of marking and sharing our progress, connecting employees to resources and each other, and building a common understanding of our direction. I hope you are as proud as I am of all that we have achieved.

Thank you,



Bob Gibbs
Associate Administrator for the Mission Support Directorate



[Click to read bio.](#)



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Find content that is most relevant to you by navigating to the themes below that align to our strategic goals:



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2021 ANNUAL REPORT ACCOMPLISHMENT LIBRARY

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Supporting National Priorities

New Leadership, Continuing Progress

Our transition to a new Administration in January 2021 set a vision for American prosperity, innovation, environmental stewardship, and increased national focus on diversity and inclusivity. NASA is positioned to lead scientific and aerospace industries in addressing issues vital to our nation and the world.

Over the summer, we welcomed Senator Bill Nelson as our Administrator, Pam Melroy as Deputy Administrator, and Bob Cabana as Associate Administrator. Our new leaders have defined a set of priorities for the agency that places mission support in a critical partnership role.



Watch Administrator Nelson's vision for NASA.



Watch Sen. Nelson being sworn in as NASA Administrator

Mission support has been working to address the following national priorities:



Infrastructure

American preeminence in science, technology, and exploration depends on a foundation of capabilities supported by NASA's unique infrastructure. Administrator Nelson has been a tremendous advocate for NASA's infrastructure needs.

In July, Bob Gibbs **testified before Congress on NASA infrastructure requirements** in support of the Administrator's continuing appeal for more resources.

[Read about Service Delivery milestones for NASA's infrastructure.](#)

[Read about Agility & Innovation milestones for NASA's infrastructure.](#)



Watch Gibbs' testimony on NASA infrastructure.

[Click here for the slides from Gibbs' testimony.](#)

Climate & Human Impact on Earth

NASA plays a key role in the nation's response to climate change. Mission support is working to create a more sustainable agency through footprint reduction, energy planning and programs, and new and sustainable construction, demolition, and environmental monitoring through the [Office of Strategic Infrastructure \(OSI\)](#). Mission support also promotes the national commitment to addressing climate change by sharing Earth science and data through the [Office of Communications \(OCOMM\)](#) and developing acquisition strategies through the [Office of Procurement \(OP\)](#) that encourage sustainable practices across the nation.

Diversity, Equity, Inclusion, & Accessibility (DEIA)

NASA is dedicated to deepening its culture of inclusion and access, and working to create a more diverse workforce, both for itself and within the broader scientific, mathematics, and engineering communities. Mission support is proud to enable this goal by responding to Executive Orders, establishing programs through our [Office of Diversity and Equal Opportunity \(ODEO\)](#), adopting partnerships and acquisitions to promote small and minority-owned businesses through [OP](#) and the [Office of Small Business Programs \(OSBP\)](#), and advancing cultural awareness and empathetic practices through human resources training opportunities offered by the [Office of the Chief Human Capital Officer \(OCHCO\)](#).



[Read more about ODEO programs.](#)

Restoring America's Global Standing & Promoting Growth

NASA's missions define American leadership in aerospace, exploration, and scientific discovery, and mission support plays a critical role in sustaining key activities. Through our infrastructure, maintained by [QSI](#), NASA offers our partners in industry and academia unique capabilities found nowhere else in the world.

The [Office of the General Counsel \(OGC\)](#) creates the legal frameworks that promote and protect commercial space activities. International agreements, like the [Artemis Accords](#), led and developed by the [Office of International and Interagency Relations \(OIIR\)](#), help sustain peaceful and equitable development of space programs across the globe. And everything NASA achieves and discovers is shared with the world through [OCOMM](#), inspiring innovation and spinoff technologies that move the nation forward.

Mission Highlights



Watch NASA's 2021 retrospective.



Watch the landing of the Perseverance Rover on Mars.

Support for Every Launch, Service for Every Discovery

The purpose of the mission support enterprise is perfectly crystallized in its name. Over the last year, we focused our business on the opportunities and issues that have the biggest impact on our ability to enable mission success. Customer service and experience drive our decision making and leaders continue to look for ways to ensure mission support employees are equipped, trained, and ready to address mission needs.

Mission support is the bedrock that makes possible every launch, discovery, flight, and technological advancement. It is vital that we see ourselves in these mission successes, because the importance of our work cannot be overstated. NASA inspires the nation and the world. Our astronauts are national heroes. Our scientific discoveries and engineering innovations encourage the next generation of explorers, mathematicians, and inventors. The foundation of all those amazing achievements are the teams of employees, managers, and leaders who maintain our facilities and capabilities. With unwavering focus on safety, productivity, and accountability, mission support enabled NASA's incredible accomplishments in 2021:



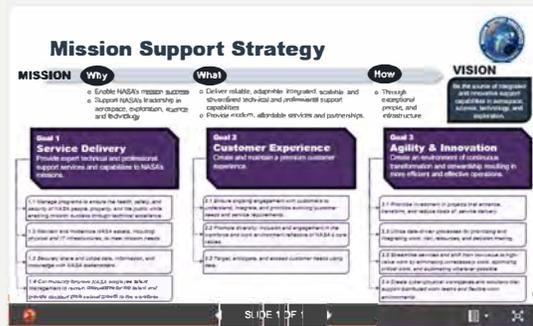
Watch the official James Webb launch footage.

- Landed the Perseverance Rover on Mars
- Launched the James Webb Space Telescope
- Initiated a series of missions committed to combating human impacts on climate change
- Welcomed new leadership to the agency
- Completed the first operational commercial crew operation to the International Space Station
- Completed Space Launch System green launch test campaign
- Continued to expand the commercial economy in low-Earth orbit
- Tested supersonic flight advancements
- Inspired the world with unique scientific discovery and exploration

Maturing the Mission Support Enterprise

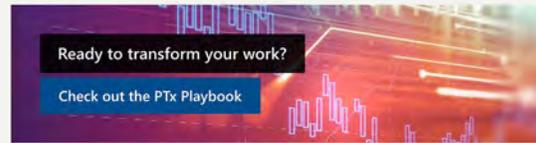
Success through Strategy, Progress through Focus

MSD implemented the **Mission Support Strategic Goals & Objectives** to align support functions around a common set of strategic focuses to deliver service, improve customer experience, and transform business. These organizing principles align with the **NASA Strategic Plan 2022**, which will be published this year.



The **Digital Transformation (DT)** effort made incredible strides to understand and equip employees to digitize and enhance work. The launch of the **PTx Playbook** will empower all employees with tools and resources to improve processes and enhance work.

As DT transitions to the **Office of the Chief Information Officer (OCIO)** for implementation, 2022 promises to provide employees with more resources to enhance work and transform our business.



[Click to visit the Digital Transformation website.](#)

Redesigning Customer Engagement to Right-Size Support

Mission support has also been redesigning how we engage customers, capture requirements, and integrate our processes. We stood up a new **Risk Management** working group and process this year, which will help to develop more precise risk measures that are integrated into our resourcing decisions. The **Planning, Programming, Budget, and Execution (PPBE)** process has been further refined and adapted to our enterprise way of working, with more input and collaboration from the resource management community across the agency. As leaders, functional owners have been meeting more directly with center and mission leaders to better understand requirements and address issues. There are many more examples articulated throughout this report, but these highlights demonstrate how mission support is maturing the development and delivery of critical services and putting our customers at the center of our focus.

Adapting our Work, Supporting our People

COVID has forced us to work in new and unfamiliar ways. Some of the ways we adapted to the circumstances have yielded great results, like our embrace of more digital tools, virtual collaborations, and remote work. The agency-wide Future of Work effort is looking closely at the ways we have transformed out of necessity in response to COVID, to understand how we can hold onto the things that work and address the things that aren't working.

So many mission support efforts have contributed to ensuring the agency remains safe, healthy, and productive throughout the pandemic. Changes to safety and facility protocols by the [Office of Protective Services \(OPS\)](#) and [OSI](#) ensured centers continued working on mission-critical tasks. [OCIO](#) provided the technology and support necessary to sustain work-from-home activities. Our legal and procurement teams responded to Executive Orders for the federal workforce and contractors, modifying contracts and prioritizing work to keep our missions on track. The [Office of the Chief Health & Medical Officer \(OCHMO\)](#), in collaboration with [OCHCO](#) and [OCOMM](#), provided clear and consistent communication across the agency on the changing conditions and frameworks for decision making.

For those struggling with loss, isolation, and stress, the **Employee Assistance Program (EAP)** offers services to help. Also, remember that you are always within your right to talk to your supervisor about your needs. As the "Best Place to Work in Government" nine years running, NASA is dedicated to your wellbeing and health above all else. You are our most valuable resource.



Click to visit the COVID response website.



Click to get helpful resources and services.

Service Delivery

SERVICE DELIVERY

CUSTOMER EXPERIENCE

AGILITY & INNOVATION



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Message from Mary Davie

2021 was a momentous year for mission support. We successfully completed **the Mission Support Future Architecture Program (MAP)** in September, and we are now in a new chapter of transformation and continuous improvement. The enterprise foundation that MAP established enables new ways of working, crossing organizational and geographic boundaries to focus on collaborative and common platforms. MAP was a long road and I want to congratulate all the mission support leaders and program managers who saw their organizations through to the finish line.

In 2021, the Mission Support Directorate (MSD) focused on increasing collaboration and partnerships, transparency, and improving service delivery. Maturing the enterprise model, leveraging available technologies, and having candid discussions what's working and what's not working continue to be of importance. Bob and I prioritized **engagement across mission support and with our center and mission directorate partners**. Through regular conversations with mission leaders and leveraging forums like our integration meetings, Mission Support Forums (two in person!), and our Mission Support Program Management Council (MS PMC), we have grown to better understand the challenges and opportunities in delivering quality services to NASA missions.

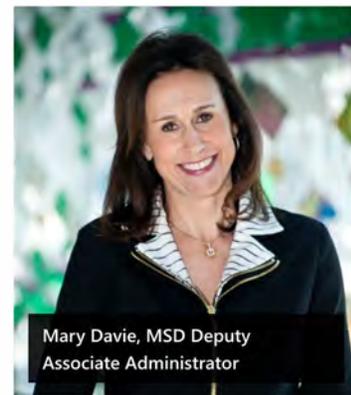
As we continue to focus on "right-sizing" mission support and strive toward our goals of efficiency, effectiveness, and agility, we initiated several projects to understand our highest priorities, our risks and the cost of mission support services. Throughout the year, the MSD Senior Leadership Team **toured every NASA center** and met with center and mission leaders to see, first-hand, the state of infrastructure and realities of the agency's very real challenges. We also conducted a **cost-transparency study**, starting with the Office of Protective Services (OPS), to understand the true cost of providing security services and what drives those costs. Additionally, during the year, we received feedback from customers and employees, analyzed data, reviewed current processes, and pushed for automation and transformation opportunities. These activities have helped shape our decision making and where to spend our time.

The MSD Core (Office of Resource Management, Office of Mission Support Transformation, Office of HQ Operations, Office of Program and Management Support) is focused on providing the connective tissue, integration, transformational capabilities, and leadership to ensure support services are optimized and aligned with mission needs.

While there is always room to improve, mission support delivered exceptional service to our missions and helped NASA reach incredible milestones this last year. You should all be proud of all that's been accomplished. In this section of our report, I want to focus on the stories that represent spectacular achievement in service delivery. Please keep pushing us forward with your ideas and suggestions.

Thank so much for all that you do,

Mary Davie
Deputy Associate Administrator for the Mission Support Directorate



Mary Davie, MSD Deputy Associate Administrator

[Click to read bio.](#)

Read MAP Value Stories from 2021:

+ Add ▾



Mission Support Directorate
MAP Value Story: Creating a Consistent Customer...

One of the primary goals of the...
Healy, Edward A. (LARC-LA000) May 11, 2021



Mission Support Directorate
MAP Value Story: Enabling Connections

NASA has entered a new age of...
Davie, Mary A. (HQ-LA000) April 7, 2021



Watch Mary Davie speak at Virginia Tech, her alma mater, on the importance of mission support & NASA's future.

Supporting Mission Milestones

Acquiring the Right Stuff

The [Office of Procurement \(OP\)](#) and [Office of the General Counsel \(OGC\)](#) supported major **acquisitions** for missions, deepening **NASA partnerships with industry** and moving us closer to establishing a lunar gateway and extending human presence further into space and on to Mars:

- Awarded the [Launch Vehicle Stage Adapter \(LVSAs\)](#) for [Artemis I & II](#).
- Enabled Demonstration Missions (crewed & uncrewed) with 5 awards for key technologies.
- Finalized the [Habitation & Logistics Outpost \(HALO\)](#) contract to establish the lunar gateway.
- Awarded [Orion Main Engine \(OME\)](#) contract for [Artemis missions VII through IX](#).
- Solicited applications for the [Exploration Extravehicular Activity Services \(xEVAS\)](#) suits, which will enable astronauts to explore the lunar surface.



Enabling & Protecting the Hybrid Workforce

The pandemic accelerated the agency-wide shift to more technologically-enabled and virtual work. The [Office of the Chief Information Officer \(OCIO\)](#) and [Office of Protective Services \(OPS\)](#) have sustained NASA productivity with a foundation of technical services, applications, IT infrastructure, and cybersecurity:

- Managed operations for over 200 applications and 3,000 websites and supported over 36 mission-critical events through telecommunications
- Continued to operate the Mission Communications Program (CP) NASA Communications (NASCOM) Mission Backbone (NMB), which provides critical support to numerous critical launches and events, including the [Commercial Crew Program](#), [International Space Station \(ISS\) resupply Soyuz, Lucy](#), and International Space Station [Extravehicular Activity Services \(xEVAS\)](#)
- suits Received [Federal Law Enforcement Training Reaccreditation](#), demonstrating the deep commitment at NASA to maintain the highest security standards
- Provided cybersecurity for NASA assets and mission work:
 - Maintained the highest [Federal Information Security Modernization Act](#) cybersecurity rating of 'Managing Risk'
 - Adopted an enterprise zero trust architecture model of cybersecurity
 - Stayed ahead of cyber threats by using emerging technologies such as blockchain and quantum computing to detect and mitigate cyber threats to space and ground systems
 - Strengthened cybersecurity by deploying the Remote Incident Response tool at several centers for remote incident response and forensics

Service Delivery: By The Numbers

NSSC, OCHCO

OPM Suitability Program Review & Staffing Service Audit



OIR, OGC

Further development & proliferation of the Artemis Accords



Diversity and Inclusion



OIR

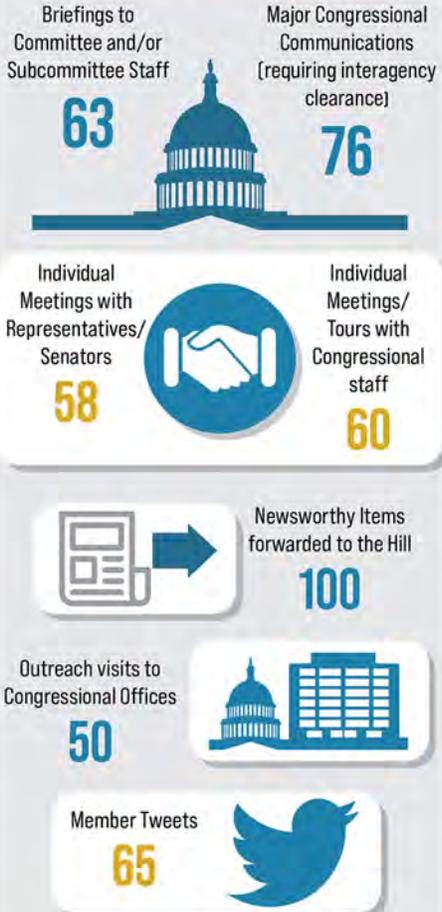
Strategic engagement with international partners to design and develop future exploration and Earth Science activities



HEARINGS, REPORTS, AND GENERAL LEGISLATIVE ACTIVITY



MEETINGS AND COMMUNICATIONS



EVENTS



Productivity through the Pandemic

Adapting and Empowering

Throughout the pandemic, NASA employees have been fully enabled by services from across mission support. In March 2020, when COVID-19 began transforming how we live and work, the agency responded with a cohesive strategic framework, clear and consistent messaging, and virtual tools. We shifted ~90 to ~95% of NASA employees to work-from-home status within a week of the federal mandate. In 2021, we deepened our ability to enable and empower our employees. In some cases, we forever transformed the way we do business by enhancing processes and services with technology, policies, and new ways of working.

Mission support achieved important accomplishments this year that provided critical services to support work during COVID:

People

The [Office of the Chief Human Capital Officer \(OCHCO\)](#) continued its *Supervisor Series*, which helps leaders agency-wide manage effectively in new and virtual conditions. OCHCO also adapted policies to ensure employees were supported as we all contend with the realities of COVID.



Process

The [Office of Strategic Infrastructure \(OSI\)](#) and [OPS](#) continued to refine facility access and maintenance to continue enabling onsite, mission-critical work. Security enhancements, like remote and responsive badging, have dramatically improved facility access and employee experience with on/offboarding.



Technology

[OCIO](#) expanded its Collaboration Services, ensuring that tools like Microsoft Teams and MURAL's virtual whiteboard are available and supported. These applications have allowed employees across the agency to connect, collaborate, and create, free from geographic and organizational constraints.



Creating the Workforce of the Future

The Right Talent, in the Right Place, at the Right Time

[OCHCO](#) continued to leverage NASA's unique **Talent Marketplace** to increase employee access to internal opportunities. This capability enables career growth by empowering individuals to seek new challenges and gain experiences in new domains. It also allows NASA to place talent where it needs to be—on specialized mission work or in critical areas—with speed and responsiveness. Talent-to-task agility is vital to maintaining NASA's leadership in the new era of space exploration and commercialization.

The **Talent Acquisition & Learning Office (TALO)** launched in March 2021 to streamline enterprise HR services and create more connection with our customers. TALO has already helped to improve the hiring process by making services and hiring options more clear to customers:

- Reduced NASA's **average time to hire from 123 days to 94 days**
- Posted **~500 opportunities** to Talent Marketplace
- **Positive results** from OPM audit of staffing actions since Staffing Services were consolidated in May 2019
- **18% of workforce gains** in FY21 were Pathways Intern appointments
- Achieved a **conversion rate of 84% for Pathways Interns** to term or perm positions following graduation



[Click to check out Talent Marketplace today.](#)

29 Days

Hiring Time Reduced

~500 Opportunities

Posted to Talent Marketplace

18% Pathways Interns

Workforce Gains in FY21

84% Conversion Rate

Pathways Interns to Perm/Term Positions



Click to learn more about the Diversity Champion award.

The Best Workforce is a Diverse Workforce

NASA won the [Diversity Champion award from LinkedIn](#), a spectacular accomplishment that resulted from the combined efforts of [OCHCO](#) and the [Office of Diversity and Equal Opportunity \(ODEO\)](#). This incredible achievement affirms that NASA is leading in the Federal Government to create spaces that are more inclusive and equitable. Nothing is more vital to the future of the agency than our ability to attract and retain the right talent for the job. Ensuring NASA can attain talent from all walks of life and empowering the current workforce to bring their all to work everyday is paramount to mission success.

Making the Agency a More Diverse and Inclusive Place to Work

Across mission support, organizations have collaborated on a whole-of-government focus on increasing diversity and equity across the federal workforce. We are proud to align with the vision to instill diversity not only in our own workforce, but in the industries with which we partner. Being a leader in science, technology, and aerospace means opening those industries to more diverse hiring and equitable practices. While there is still much to be done, in 2021 we took action to support diversity, equity, inclusion, and accessibility efforts:

- Mission support, in conjunction with Mission Directorates and alignment with [Executive Order 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government](#), engaged the public and received ~195 public comments on how to advance equity at NASA.
- [ODEO](#) led the development of a 200 Day Equity Assessment Report in collaboration with organizations across mission support.
- [OP](#) and the [Office of Small Business Programs \(OSBP\)](#) conducted outreach to businesses in underserved or underrepresented communities.
- Took action on Executive Orders (EO) related to workforce enhancement, diversity, and equity, including EOs [13985](#), [13988](#), [14020](#), [14031](#), and [14035](#).

Read the Executive Orders for a more equitable & accessible government:

- [Advancing Racial Equity and Support for Underserved Communities](#)
- [Preventing and Combating Discrimination on the Basis of Gender Identity or Sexual Orientation](#)
- [Establishment of the White House Gender Policy Council](#)
- [Advancing Equity for Asian Americans, Native Hawaiians, and Pacific Islanders](#)
- [Diversity, Equity, Inclusion, and Accessibility in the Federal Workforce](#)

Resourcing Work & Optimizing Under Constraints



Click to see Rob's bio.

Message from Rob Carver, Director of the Mission Support Resources Management Office

Over the last decade, mission support's portion of the agency topline budget has dropped from **17%** to **12%**. Meanwhile, mission support has continued to provide the essential business and infrastructure foundation for increasing activities in our mission programs. This demonstrates that by maintaining service, we are already finding efficiencies. By transitioning to an enterprise management and delivery model, we are leveraging new ways of working and producing efficiencies that let us continue meeting mission needs, despite constraints.

Meeting Evolving Needs

The **Planning, Programming, Budgeting, and Execution (PPBE)** cycle has also been transforming to meet the evolving demands of our missions. We have expanded our **direct engagement with centers and missions** to form a more collaborative methodology. We are integrating mission support's strategy, better risk assessments from the new Risk Management process, and performance management into the PPBE cycle. MS RMO is also seeking ways to reduce the administrative burden of the budget cycle by improving processes and utilizing technologies.

In the last two cycles, our story is being told in clearer detail and with greater resonance to stakeholders like the Office of Management and Budget (OMB) and Congress. Particularly when it comes to advocating for our infrastructure needs, we are improving how we communicate the investments needed in mission support to sustain our awesome mission activities.



Read the entire agency narrative. Mission support is on pages 755 to 842.



Click to see the presentation to Congress.



Click for a sneak preview of the PPBE23 presentation.

Making the Mission Support Dollar Go Further

While we continue to advocate strongly for mission support needs, we cannot assume more resources are on their way. We are maximizing efficiencies through collaboration, technology, engagement, and optimizing the impact of every investment. In 2021, we made great strides and achieved important milestones in bettering our business, regardless of resourcing limitations:

- [MSD Core](#) launched a Cost Transparency Study to better understand the true and total cost of critical support requirements, starting with protective services. This first study will create a framework to enable mission support to identify cost drivers and share a clearer understanding of individual lines of business.
- The [Office of the Chief Financial Officer \(OCFO\)](#) completed the inaugural Capacity Assessment and Annual Evaluation Plan (AEP). NASA was recognized by the [Association of Government Accountants for Excellence in Fiscal Accountability Reporting](#).

Foundational Infrastructure

Providing the Foundation for Every Mission

NASA's infrastructure is critical for every launch, test, scientific breakthrough, data collection, and technological advancement. The President's focus on infrastructure in 2021 ignited renewed energy in NASA's infrastructure needs. The Administrator's advocacy for critical investments led to a Congressional testimony by mission support's Bob Gibbs (*video to the right*). These meaningful steps, coupled with the achievements in facility service, construction, demolition, and repairs, are moving the agency forward:

- [OSI](#) continued to develop the [Agency Master Plan](#), a prioritizing document that will connect capabilities to physical assets to missions for enhanced planning and agency-wide sustainment.
- The Space Environments Testing Management Office (SETMO) worked to maintain critical and unique capabilities that are vital to NASA's current and future missions (*video to the right*).
- OSI reached several milestones in construction and repair to ensure facilities and infrastructure are mission-ready when needed:
 - [Vertical Motion Simulator at Ames Research Center \(ARC\) for Human Landing Systems \(HLS\)](#)
 - Refurbished [Johnson Space Center's Vacuum Chambers A&B](#)
 - Restored & modernized the [Arc Jet Complex](#) at ARC
 - Enabled [Glenn Research Center's Vacuum Facility 5](#) for long-duration performance testing of Advanced Electric Propulsion System (AEPS) thrusters
- OSI conducted tests and provide critical maintenance to support mission activities:
 - Conducted flight test using the vertical motion simulator at ARC for Advanced Air Mobility (AAM)
 - Tested the [Advanced NASA Evolutionary Xenon Thruster \(NEXT\)](#) electronic propulsion thruster
 - Initiated Arc-Flash mitigation at six centers to ensure employee safety
- OSI's Logistics Management Division (LMD) continued to evolve its program support to ensure every mission is fully enabled with the right stuff, on time, with minimal burden (*video to the right*).
- Continued processes improvement to submit the right projects for PPBE23



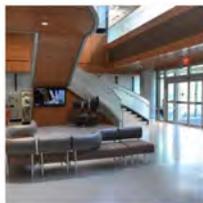
Bob Gibbs testifies to Congress on NASA infrastructure



SETMO video on maintaining key capabilities



How Logistics transformed to meet mission demand





Click for more on MSFC's Bldg. 4221 award-winning design.



Click for more about NASA's environmental commitment.



Click for more about the LEED Gold project.

Leading Environmental Stewardship by Example

NASA is committed to leading by example when it comes to addressing human impacts on climate and the Earth. [OSI](#) has made incredible strides in 2021, working with centers and pursuing opportunities to reduce the agency's footprint. Projects and management strategies have reduced energy and water usage, and NASA has been recognized for its leadership in environmental stewardship:

- Marshall Space Flight Center's (MSFC) Building 4221 was awarded the [Green Globes 2020 project of the year](#).
- Mission support published the [Agency Climate Action Plan](#) to support the Federal approach to environmental stewardship.
- Invested \$6M in existing building retro-commissioning projects for energy efficiencies and lower operating costs
- Awarded [LEED New Construction Gold](#) for [Research Support Building at GRC](#)
- Submitted the Draft 2021 [NASA Sustainability Plan to the Council for Environmental Quality](#).
- Implemented [DOE's 50001 Ready program](#) to standardize energy and water management systems across the agency
- Greatly expanded the use of solar power with photovoltaic system installations:
 - Jet Propulsion Laboratory (JPL) parking structure added 900 kilowatts; investigating other facilities for similar installations
 - Using Enhanced Use Lease Authority on underutilized property; 100 acres at Michoud Assembly Facility (MAF) produces 20 megawatts
 - 491 acres at Kennedy Space Center (KSC) hosts 74.5 megawatts (construction complete in June)
- Recognized by the White House for developing a more resilient supply chain, using an existing tool to screen mission-critical supplies and goods.
- Supported and responded to [Executive Order 14008, Tackling the Climate Crisis at Home and Abroad](#).

Reorganizing Aircraft Capability Management

Reorganizing to Ensure NASA's Leadership in Aerospace

In March 2021, the agency decided to move aircraft management out of [OSI](#) and divide capability development and technical oversight between two offices. The new **Aircraft Capability Management Office (ACMO)**, aligned directly to the MSD front office under Bob Gibbs, will support the continued projection, assessment, and development of aircraft capabilities across NASA. Technical and independent oversight for aircraft activities will fall to the Aviation Safety Program (ASP), under the [Office of Safety and Mission Assurance \(OSMA\)](#). This is an important step to evolve how mission support addresses needs in an evolving environment, where technologies are changing at an accelerated rate.

Mission support **engaged** the technical community, centers, missions, and other stakeholders to carefully outline current requirements for aircraft safety, logistics, and capability management. After rigorous vetting, the agency decided on a **new organizational model and division of responsibilities** between ACMO and ASP.

Read Bob Gibbs' announcement:

+ Add v



Mission Support Directorate

Realignment of Aircraft Management Functions

Gibbs, Robert (HQ-LA000) January 23

[Read the original Agency decision memo.](#)

Dividing aircraft management, capability development, safety controls, and technical oversight will position NASA for success in the fast-moving and ever-changing world of aerospace research.

ACMO Responsibilities:

- Build a strong foundation of aircraft capability to support NASA missions requiring airborne assets.
- Advance aircraft capabilities, intrinsic to NASA, to meet long-term agency needs (strategic fleet management).
- Optimize deployment of aircraft capabilities across NASA field centers to support missions.
- Transition those aircraft capabilities not intrinsic to NASA to commercial providers, when appropriate.
- Appropriately resource and sustain a combination of specialized workforce, infrastructure, and unique assets to facilitate NASA programs and projects.
- Serve as primary interface, both internal and external to the agency, for Aircraft/Unmanned Aircraft Systems (UAS).
- Advance aircraft capability operational tools and processes, including but not limited to:
 - Develop and Report Annual Flight Operation Measurements.
 - Develop and Manage Policy for Passenger Transportation.
 - Review and Approve Aircraft/UAS Space Act Agreements.
 - Maintain agency Pilot Training Simulator Contract(s).
 - Manage NASA Aircraft Management Information System (NAMIS).
- Serve as the interface between mission directorates (requirement owners) and field centers (capability owners).

OSMA Responsibilities:

- Establish and assure compliance with aviation safety strategies.
- Perform risk identification and assessments.
- Provide recommendations for risk mitigation and acceptance.
- Perform independent aviation safety assessments and process verification reviews.
- Provide analysis and recommendations for critical aviation safety decisions.
- Provide an Independent Safety and Technical Reporting Path.



Sustaining the Agency's Aircrafts for Aerospace Missions

Throughout 2021, [OSI's](#) Aircraft Management Division (AMD) continued to sustain the NASA's aircrafts with operational and acquisition support:

- Enabled 6,932 flight hours of safe aircraft operations.
- Supported KSC's replacement of aging Huey II helicopters with new Airbus H-135 helicopters.
- Supported the acquisition of a Gulfstream G-IV aircraft for Langley Research Center (LaRC).
- Supported the acquisition of a Pilatus PC-12 at GRC to replace the 50-year old Twin Otter aircraft.



Customer Experience

SERVICE DELIVERY

CUSTOMER EXPERIENCE

AGILITY & INNOVATION



On this page:



Connected through Technology



Making Enterprise Services Better for Customers



Supporting Employees through COVID



Reducing Administrative Burden



Core Improvements

Mission Success = Customer Experience = Empowered Employees

By September 2021, all of mission support had transitioned to an enterprise model for management and service delivery. As we work to deepen that model and expand the benefits of working in an enterprise way, we recognize the critical link between customer experience and employee enablement. Within mission support, we have worked to empower employees with the tools, knowledge, and connections they need to respond quickly and accurately to center and mission needs. For our customers, we have focused our attention on the user experience for priority services and have implemented process improvements, technologies, and new strategies to make it easier for missions to get what they need.

Many of the changes we have implemented for customers leverage the power of technology to make better connections and support a cleaner and more immediate response. We have also worked to improve the linkages between Mission Support Enterprise Organizations (MSEOs) and to deliver support services with a more cohesive and consistent approach across the Agency. With the [NASA Shared Services Center \(NSSC\)](#) as a key mechanism for effective and efficient service delivery, mission support is working to ensure all employees are empowered with the right tools and services to get the job done.

Connected through Technology

New OCIO Logo

**Collaborating, Creating, and Improving in a Virtual Landscape**

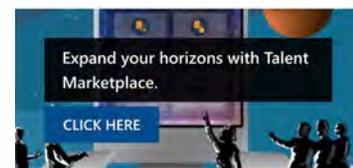
Improving information technology (IT) is a cornerstone investment in all NASA employees. By connecting people, providing digital tools, and offering technical support, NASA unleashes the collaborative and creative power of its workforce. In 2021, the [Office of the Chief Information Officer \(OCIO\)](#) made customer experience a priority and implemented changes to help employees - in both mission support and our customer base - get to that next level of work:

- Developed new branding for OCIO to migrate all service lines into one brand for better communications and clear messaging on IT services.
- Redesigned the [OCIO intranet](#) to create a front door for IT Services.
- Created a [self-service portal](#) and other resources to enable employees to find their own answers and get their problems resolved quickly.
- Started establishing Business Relationship Managers (BRMs) and Customer Relationship Managers (CRMs) as the consistent customer interfaces.

Technology as a Force Multiplier for Development, Recruitment, and Connection

In 2021, NASA's IT investments across mission support were accelerated to meet the demands of a virtual work environment, brought on by the COVID-19 pandemic. By rethinking core services, like learning tools, with a more digital perspective, mission support expanded the effectiveness of several programs:

- The [Office of the Chief Human Capital Officer \(OCHCO\)](#) increased employee access to development opportunities by furnishing the [Talent Marketplace](#) for internal work rotations and details.
- The [Office of the Chief Financial Officer \(OCFO\)](#) revamped the CFO University curriculum with 6 new courses deployed through virtual learning, reaching 3,000+ trainees in FY21 (up from ~300 prior to the pandemic).
- [OCFO](#) coordinated and led the development of the agency's inaugural Learning Agenda in response to the recently enacted [Foundations for Evidence-based Policymaking Act](#).
- [OCHCO](#) implemented the Astronaut Selection tool, a specialized recruitment capability made for NASA's unique need to find the best and brightest pilots, engineers, and scientists to serve as astronauts.
- The [Office of Communications \(OCOMM\)](#) continued to expand the [OneNASA intranet](#), providing the agency with an enhanced, internal communication capability through SharePoint.



6 Courses

Added to CFO University

3,000+ Trainees

Newly Graduated from CFO Courses

1 New Tool

For Specialized Astronaut Selection

Making Enterprise Services Better for Customers

Services that Span the Agency

Among the core values of an enterprise service delivery model is the ability to leverage a tool, expert, or capability from anywhere in the agency. By concentrating expertise and using technology to increase access, mission support provides increased support to customers while lowering costs. The [NSSC](#) provides numerous transactional and administrative capabilities, including IT, finance, and human resources. Through the NSSC, mission support enterprise offerings are better supported, packaged, and delivered to customers in need. As mission support continues to mature its enterprise model, we increasingly leverage the awesome capabilities the NSSC provides.

Putting Customers First

In 2021, the NSSC continued to refine its strategy, processes, and capabilities to provide customers with a more streamlined, engaged, and intuitive suite of services and functions. The NSSC is a vital component of making the mission support enterprise fulfill its potential as a force for enhanced customer experience, improved effectiveness, and optimal efficiency:

- Initiated the ["Voice of the Customer"](#) page and web modernization project for more direct-to-customer support.
- The NSSC Contracting Officers and Service Providers were nominated by the Space Technology Mission Directorate (STMD) for an Agency Group Achievement Award for the numerous modifications to existing and future Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) awards during the pandemic.
- Migrated Staffing Services, Training Administration (to include MSEO functionality), Personnel Action Requests, Leave Programs, In-Processing, and Suitability Adjudication Services into the ServiceNow [HRSD Environment to provide a one-stop-shop Employee Service Portal for all Human Resources Services](#).
- Hosted "Ask the NSSC" events to provide direct employee support and communication (*see links to the right to revisit the events*).
- Implemented the AEGIS Service Catalogue with the [Enterprise Service Desk \(ESD\)](#) to provide one-stop-shop for enterprise IT service ordering.
- Successfully transitioned NASA Information Support Center calls to [ESD](#) to include the [Agency Applications Office \(AAO\)](#), [Marshall Space Flight Center \(MSFC\)](#), and [Office of the Administrator](#) after-hours call volume (approx. 35,000 transactions) at a cost avoidance of over \$500K.
- Developed a new Domestic Travel Statistical Sampling Database in ServiceNow and retired the legacy ColdFusion application.
- Implemented electronic signatures for retirement processing, which provided an improved customer experience and ensured a more efficient process.
- Partnered with [OCHCO](#) and NASA's payroll provider, Interior Business Center, to request the opportunity to pilot Robotic Process Automations for the processing of Personnel Actions that will automate transactions.
- Implemented the automation of USAStaffing Onboarding documents to flow directly into e-OPF.
- Transformed NSSC's Information Management Program from an outdated model of task-oriented records management activities into an integrated, technology-driven program, resulting in the destruction of over 2 million records and cost reduction with cloud and box storage.
- Reduced the NSSC physical footprint on the Stennis Space Center by moving out of Building 1100, which resulted in cost avoidance of \$250K.
- Completed the OPM Suitability Program Review and Staffing Services Audit, with feedback that demonstrates a maturation of shared services capability.

"The OPM Audit team was impressed that based on the volume of work in the first 6 months of the year (i.e., 62,706 applications, 1,600 certificates, and 987 selections), NASA's staffing activities were reflective of an agency with a lot more time and experience with USAStaffing and centralized operations. They also were complimentary of how we have evolved our processes when issues are identified and continue to improve operations as a part of doing business."

Missed the "Ask the NSSC" events?
Read the material and see the recordings today!

+ Add v



Inside NSSC

Ask the NSSC Event: Simplified Acquisition Threshold

Thank you for attending our latest...
Pohto, Zachary J. (NSSC-NSSC)Service Pro



Inside NSSC

Ask the NSSC: Grants and Cooperative Agreements

Thank you for attending our latest...
Pohto, Zachary J. (NSSC-NSSC)Service Pro



Inside NSSC

Ask the NSSC: Small Business Innovation Research (SBIR) an...

Thank you for attending our latest...
Pohto, Zachary J. (NSSC-NSSC)Service Pro



Inside NSSC

Ask the NSSC Event: Simplified Acquisition Threshold

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Pohto, Zachary J. (NSSC-NSSC)Service Pro



Inside NSSC

Ask the NSSC: Overview of Telework Flexibilities for...

Thank you for attending our latest...
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Inside NSSC

Ask the NSSC: Annual Leave Restoration

Thank you for attending our latest...
Gonzales, Venetia M. (NSSC-XF010) Nover



Inside NSSC

Ask the NSSC: Families First Coronavirus Response Act...

Thank you for attending our latest...
Gonzales, Venetia M. (NSSC-XF010) Septen



Inside NSSC

Ask the NSSC: Paid Parental Leave

Thank you for attending our latest...
Gonzales, Venetia M. (NSSC-XF010) Septen

Use the NSSC Services Portal to find what you need quickly.

[CLICK HERE](#)

Contact the Enterprise Service Center to get your needs met.

[CLICK HERE](#)

Provide direct "Voice of the Customer" feedback.

[CLICK HERE](#)

Supporting Employees through COVID



Watch NASA's CHMO, Dr. Polk, talk about contact tracing.



Other pandemic support services.

Meeting the Customer in the Moment

Throughout the pandemic, NASA has remained focused on inspiring the world with discoveries. Mission support played an essential role in ensuring continued productivity across the agency by understanding and meeting customer needs as they adapted to new conditions. In addition to the important [services delivered to support throughout COVID](#), the following accomplishments and activities helped shape a new way to engage and support customers:

- [OCOMM](#) led the internal communication initiative that gathered together [OCHCO](#), the [Office of the Chief Health and Medical Officer \(OCHMO\)](#), and the [Office of the General Counsel \(OGC\)](#) to create a single, consistent strategy and message for COVID responses.
- [OCIO](#) created new training resources and expanded [Workplace and Collaboration Services \(WCS\)](#) to supported the increased reliance on virtual collaboration tools like MS Teams, MURAL, and SharePoint.
- [OCIO](#) invested in VPN improvement to ensure connectivity and cybersecurity for an at-home workforce.
- [OCHMO](#), in conjunction with [OCHCO](#), created contract tracing and data dashboards to increase safety and strategic decision-making across the agency.
- The Mission Support Directorate (MSD) maintained the support integration meeting between all centers and MSEOs to ensure responsiveness to evolving needs and conditions.

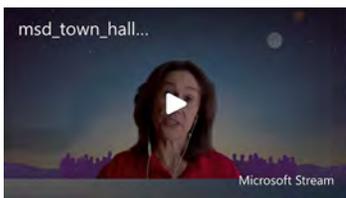
Reducing Administrative Burden

Making Things Easier to Make Work Better

A central goal to all mission support improvements is to **make it easier for centers and missions to get what they need**. In 2021, several projects helped reduce the administrative burden to customers and streamline processes for better service delivery. Some projects focused on enhancing mission support so that mission support employees could better provide service to customers. Other projects aimed to improve an existing system or function. These consolidation activities make work better for everyone by eliminating costs, simplifying the environment, and focusing the solution on the customer:

- The [Office of Protective Services \(OPS\)](#) created a single [visitor management system](#) and centralized video management solution for the agency.
- The [Office of Strategic Infrastructure \(OSI\)](#) created centralized real estate management through real property accounting offices.
- [OSI](#) established leadership roles to consolidate the agency GIS portfolio and establish a function that is a cross-cutting community of practice.
- The [Office of Procurement \(OP\)](#) and the [Office of Small Business Programs \(OSBP\)](#) continued to consolidate contracts and improve acquisition procedures for contract goods and services.
- The [NSSC's](#) web modernization project eliminated 2,100 FAQ pages and reduced several online footprints through significant reductions of web page volumes:
 - [Financial Management](#) (80%)
 - [Procurement](#) (70%)
 - [Enterprise Services](#) (50%)
 - [Human Resources](#) (75%)
 - [Mission Support](#) (70%)

Core Improvements



Watch the March 2021 MSD Town Hall.



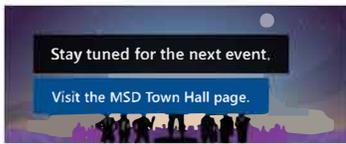
Watch the October 2021 MSD Town Hall.

Forming Connections, Improving Governance

MSD worked in 2021 to revitalize certain leadership forums that would enhance connections between missions, centers, and mission support. Starting with direct mission engagements, MSD has been collecting and analyzing feedback and data on the maturity of the mission support enterprise. Using these data, MSD has developed strategies and initiatives to strengthen service management and delivery to better benefit NASA missions.

MSD initiated a new series of **MSD Town Halls** that focus on providing the entire mission support community with critical updates and information on enterprise issues and opportunities. MSD hosted its first Town Hall in March (*content to the left*), sharing the vision and direction for the support enterprise. In October, the second Town Hall focused on the official end of the Mission Support Future Architecture Program (MAP) and what mission support would look like in a post-MAP world, and answered questions submitted by mission support employees.

By revamping the **Mission Support Program Management Council (MSPMC)**, MSD is looking to enhance how MSEOs manage their business with a firm understanding of customer needs, supported by data.



MSD also reformed the **Mission Support (MS) Forums** to focus on the relationships between support providers and the many stakeholders across the agency. The MS Forum in July helped establish better understanding of center conditions and support requirements. In December, the MS Forum focused on the development of a Concept of Operations that would better articulate the roles and responsibilities of centers and MSEOs to capture and respond to mission requirements.

A Better Hub for Enterprise Management

MSD continues to provide strategy, leadership, and integration for the mission support community. In 2021, the MSD team toured center facilities to **document infrastructure challenges** and failures for better advocacy for investment. MSD also initiated the **cost transparency study**, starting with [OPS](#), to better understand the true cost of support services. Through meetings, including the periodic integration call with Center Associate Directors and MSEO leaders, MSD is **creating forums** for support providers and customers to address issues and opportunities. MSD continues to explore what is working and not working across the mission support enterprise to develop and offer value-enhancing solutions and a forum for mitigating risks and promoting opportunities.

In 2021, MSD formed the Program Management and Support Office (PMSO) to better manage governance, communications, acquisition, and budget for MSD Core. Led by Robert Hubbard, Director, PMSO will help address critical connections between MSEOs and their customers by examining how MSD could better support enterprise service development and delivery. PMSO will help develop a more streamlined MSD Core in order to provide the kind of enterprise-support capabilities needed to help mature mission support.

Sharing Information Leads to Collaboration and Innovation

Enhancing internal access to information, tools, resources, and opportunities is critical to realizing the full potential of the mission support enterprise. The OneNASA intranet project, led by [OCOMM](#) and supported by [OCIO](#), is a major step toward establishing a **single backbone of knowledge management, communication, and integrated tools** for the entire agency. Using the SharePoint intranet has allowed functions, offices, and individuals to share and connect with content from anywhere in the agency, regardless of geographic or organizational location.

MSD is working to promote **more cohesion and openness in sharing information** across mission support by developing products, like this Annual Report, that will allow employees to identify and connect with people, technology, and information.



SERVICE DELIVERY

CUSTOMER EXPERIENCE

AGILITY & INNOVATION



On this page:

Message from Jamie Krauk

Transformations

Improving Infrastructure

Future of Work

Improving How We Work, Together

Message from Jamie Krauk

I joined NASA and the Mission Support Directorate (MSD) in August 2021 and there were already so many accomplishments in transformation. I met with Bob and Mary and began to assess the landscape. Over the three prior years that the Mission Support Future Architecture Program (MAP) worked to establish a foundation for the enterprise service delivery model, numerous capabilities had developed. With many efforts already underway, I initiated a strategy to examine and implement the most transformative projects that would really galvanize our enterprise model. Working with change agents and transformational leaders across mission support, we were guided by three questions that defined our focus:

Where are we going, and what are we trying to achieve?

In Spring 2021, the **Mission Support Strategic Plan** was fully implemented and embraced by the community. The [Mission Support Transformation Office \(MSTO\)](#) continues to promote and socialize the Plan's goals and objectives to create greater alignment and connection across the mission support community. The goal: Mission Support for Mission Success. Connection to the mission is always paramount.

MSTO also worked with the [Office of the Chief Financial Officer \(OCFO\)](#) to crystalize mission support's role and ownership in the **NASA Strategic Plan 2022** (to be released in early 2022). These vital strategic pieces lend direction to all Mission Support Enterprise Organizations (MSEOs) as well as our partner Agency Technical Authorities (ATAs).

As mission support continues to **integrate workstreams**, the multifaceted management cycles that oversee requirements gathering, budget, risk, investment, and organizational performance work in a synchronistic way to enhance mission support services.

How do we work, and how can it be improved?

MSTO kicked off the effort to fulfill the new Strategic Plan by crystalizing the roles and responsibilities of leaders, cohorts, and organizations in a **Concept of Operations (ConOps)**. A ConOps is a vital business tool that supports complex and evolving operating environments, like NASA's mission support. The ConOps will help support the **Risk Management Working Group** and utilize the **Change Management Framework**, both of which were implemented in 2021.

Developing the ConOps will be a collaborative endeavor involving all stakeholders: missions, centers, MSEOs, ATAs and the A-Suite. When finished, it will support the next phase of maturity and transformation for the mission support enterprise, starting with the return to the foundational idea of improving work with [Eliminate-Optimize-Automate \(EOA\)](#).

In the same spirit of optimizing how we work, I'm also delighted to be part of the **Smart Centers initiative**, a concept that looks to link technology, modeling, and data integration to help solve some of our pressing challenges like aging infrastructure. If we can provide tools to help our facilities experts with early indicators of repair or maintenance needs, it can help them use their time most wisely. It can also provide a lower-cost proving ground to some of our key Mission Directorate colleagues (e.g. ARMD and STMD) as they test emerging tools here on planet for facilities-use now but for eventual use in other environments.



Click to read Jamie's bio.



Visualization integration for mission support.

How do we spend our time together, and are we moving in the right direction?

In order to define better HOW we work together, it is critical that mission support leverage stakeholder input. By optimizing the time that mission support uses to manage its own business and engage with customers, we establish a cadence for improving our work for a better customer experience. Leveraging forums to ask the right questions and co-create solutions is a critical element. At the end of 2021, MSTO began assembling the **Transformation Community of Practice (CoP)** to bring together the change agents and implementers across mission support who are working tirelessly to transform their own organizations in a post-MAP environment. The CoP brings them together to learn from one another, and as importantly, to ensure that we don't duplicate effort or create many different ways of doing things for our customers.

To further enhance how mission support works together, MSTO is revamping the **Mission Support Program Management Council (MSPMC)** and **Mission Support (MS) Forums**. Both are vital engagements where candid discussions and firm decisions will help the mission support community move forward in its shared goals and continue to drive horizontal integration.

Thank you,

2022 promises to be an incredible year of more transformation and growth for mission support as we deepen the connections between customers and providers and enhance our work with technologies and process improvement.

Transformations



Are you ready to transform your work?

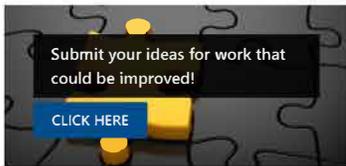
Process Transformation in Everyone's Hands

In 2021, [MSTO](#) reached a major milestone by completing the initial **Process Transformation (PTx) Playbook**. This totally-online, comprehensive resource equips each and every employee with a toolkit to assess and improve their own work. The PTx Playbook was envisioned by the Digital Transformation team, led by Jill Marlowe. [OCIO](#) and the [Office of Communication \(OCOMM\)](#) were instrumental in developing this incredible resource and making it accessible to all NASA employees.

The Playbook consists of steps to follow when considering improvement for your work, including an online workbook feature to help develop your ideas. If you have already identified a potential improvement, the Playbook provides resources, methods, and industry examples for solutions to implement. The Playbook is a choose-your-own-adventure guide that will help you shift from low-value to high-value work.

MSTO is also opening a collection tool for mission support to begin submitting ideas for work that could be improved. By submitting work, you are proposing to the MSTO and Transformation CoP that there is a way to make mission support more effective and/or efficient. As specialists and functional owners who are closest to the work, you are best positioned to see where work can be improved, automated, or eliminated altogether.

Check out the Playbook and start considering ideas to submit to make mission support services better!



Technology Underpins All Work

The [Office of the Chief Information Officer \(OCIO\)](#) is modernizing services to ensure every employee is equipped to fulfill mission requirements. Their comprehensive strategy includes:

- Upgrades to VPN systems for better access while teleworking
- Improved data access for multiple users, including migration to cloud services (a necessity for data-heavy operations in Artemis)
- Better IT response and [Workpace and Collaboration Services \(WCS\)](#) with streamlined processes, IT Helpdesk, and 500+ inventoried services for WCS



Watch NASA CIO Jeff Seaton talk about the OCIO Transformation on NASATube.



Turn your work into automation.

Automate Whenever Possible

Automation is a critical enhancement to continuing to service mission needs with constrained resources. Saving work hours through automation is critical to making support services affordable. These examples of automation are helping employees stay focused on the work that requires human touch, leaving behind mundane and repetitive tasks:

- The [Office of Protective Services \(OPS\)](#) implemented automated investigations and continuous evaluations to increase security while lowering administrative burden for processing.
- The [NASA Shared Services Center \(NSSC\)](#) implemented automation for USAStaffing onboarding documents, reducing the number of transactions.
- [NSSC](#) and [OCIO](#) created a single enterprise robotic process automation service to facilitate robotic operations against enterprise and/or center-level applications or tools.

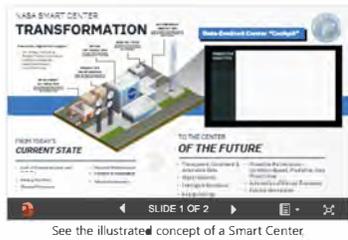


Read GSA's report on using RPA in government.

Digitizing Systems Makes them More Accessible and Efficient

Shifting processes and systems to fully digital solutions enables better access, more capabilities, and the potential for future automation. Leveraging a mix of out-of-the-box and customized technologies helps mission support enter the 21st century and optimize its efficiency:

- The [Office of the General Counsel \(OGC\)](#) implemented NASA's Legal Enterprise Operating System to modernize legal knowledge management and consolidate work products, data, and case records.
- [OPS](#) created an Integrated Security Strategy Program Model that leverages technology to heighten security and provide consistent coverage across the agency.
- The [Office of the Chief Human Capital Officer \(OCHCO\)](#) continued its Human Capital Information Technology journey, identifying capabilities to be consolidated in a smaller suite of integrated applications.



See the illustrated concept of a Smart Center

Creating Centers of the Future

NASA is developing a strategy to create **Smart Centers**: workspaces that are interconnected with digital capabilities and technologies. Borrowing from concepts like the "Internet of Things," we are imagining a future-state where our physical infrastructure can provide data, different digital inputs can interact, and data models can better maintain assets. While it may take time to realize the total vision (*see slides to the left*), NASA is already installing new digital systems that use sensors, monitors, artificial intelligence, and other computing to enhance how we work. Ultimately, Agency facilities will enable our missions with low-cost, in-center areas to test equipment and systems.

The Smart Center initiative is led by Executive Sponsors Jamie Krauk, Joel Carney of OSI, Walt Engelund of Space Technology Mission Directorate (STMD) and Jon Montgomery of Aerospace Research Mission Directorate (ARMD), along with Program Manager Rodney Martin and a Community of Practice (CoP). The first step of this initiative is to inventory the digital capabilities already implemented across the Agency. After determining the technologies with the greatest value and scalability, the team will create and implement an investment strategy.

Digitizing, Training, and Culture Shifting for a Hybrid Workforce

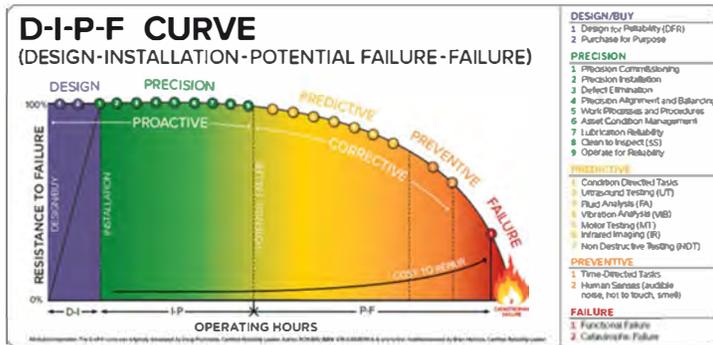
Capabilities, like the NASA Enterprise Physical Access Control System installed by [OPS](#), help digitize facilities. We are also working to shift culture, along with our physical workspaces, to adhere to best-practices for a hybrid workforce. The Modern and Inclusive Collaboration Spaces (MICS) project, for example, is working to identify the skills, hardware, and resources needed to increase productivity and support seamless execution of mission requirements. MICS produced training content to support cyber-physical spaces and tools, which will become available in February 2022 on [SATERN](#). Over time, these projects will create a totally digitized environment that enhances NASA physical asset management and capabilities with data integrated facilities and infrastructure.



Access SATERN to get training on new tools and resources.

Condition-Based Maintenance Drives Down Costs

The [Office of Strategic Infrastructure \(OSI\)](#) is using technology and data in planning and maintenance activities to support a more sustainable and responsive physical asset portfolio. In 2021, investments in **condition-based maintenance (CBM)** allowed specialists to identify and address failing systems before failure occurred, averting damaging breakages and costly delays to mission work. As shown below in the Potential Failure curve (or P-F curve), earlier interventions with failing assets means the repair is cheaper, the impacts are lower, and the asset has a longer life. In the last fiscal year, NASA avoided a total of \$27M in repair costs due to CBM.



D-I-P-F Curve

[Read more about the P-F Curve & CBM.](#)

CBM Success Story

Sensors were recently installed on a 16,500 horsepower motor at Glenn Research Center, which indicated issues during testing. In response to the sensor data, the attending engineers investigated the issue and determined an allowable range for operation, avoiding a catastrophic failure which would have destroyed the asset. Without CBM, this machine would have continued to run at full capacity and significant damage would have occurred, costing in excess of \$9M, plus delays. Instead, programmed repair can be completed at a cost of ~\$2M while continuing operations.

Sustainability through Consolidation

The majority of NASA's infrastructure was constructed during the Apollo era. Now, with 83% of infrastructure beyond designed life, creating a sustainable agency footprint requires the consolidation and demolition of facilities. By modernizing existing spaces and constructing new facilities, the agency is able to reduce its footprint and associated costs. In 2021, [OSI](#) led Agency-wide efforts to utilize water and electricity more effectively and conducted planning activities to prepare for modernization and consolidation efforts. OSI, in alignment with leadership, promoted NASA's infrastructure needs with external stakeholders to secure the necessary investments to modernize and build, allowing for more consolidation and demolition.

Sustainability through Improvement

The Agency has taken steps toward replacing its vehicle fleet and infrastructure to be all electric which aligns with the Administration's vision for whole-of-government approach to environmental stewardship. In 2021, OSI laid out a roadmap for installing 120 charging ports and acquiring 55 new electric vehicles. Eventually, NASA will replace its entire fleet with electric vehicles with Center-wide infrastructure to support electric operations.

Future of Work

Imagining the Workplace of Tomorrow

Lead by the Chief Resilience Officer, Melanie Saunders, the [Future of Work \(FoW\) Team](#) considered new ways the agency can use its physical space, leverage digital and virtual capabilities, and adapt the workforce to evolving mission needs. Due to the response to COVID, FoW activities have accelerated, forcing NASA to adopt a hybrid workforce strategy. The FoW Team considered how NASA can embrace leading-edge thinking and capabilities to improve operations:

- The [Office of Communications \(OCOMM\)](#) produced a video on ["The Future of NASA"](#) to project a potential future state based on leadership's vision (*video to the right*).
- [OCHCO](#) developed tips, lists, and other tools to support employees and supervisors as they acclimate to hybrid environments, including:
 - Supervisor Checklist
 - Tips for Conducting Challenging Conversations
 - Tips for Conducting Challenging Conversations in a Virtual Setting
 - Knowledge Resources
 - Telework/Remote Work Denial Consultation Process
 - Remote Work Cost Analysis Worksheet and Instructions
 - Position Assessment Tool
 - Flexible Work Schedules Aid
 - Telework Scenarios Duty Station Locality Pay and Travel
- [OPS](#) implemented Virtual PIV Badge renewals to support a hybrid workplace.
- The FoW team initiated the development of training and support products that will help employees navigate a hybrid workspace effectively.
- [OCIO](#) continued to be a key enabler and leader for FoW design and planning by supporting the technical requirements and understanding for hardware, software, and cyber needs.
- The [Office of Diversity and Equal Opportunity \(ODEO\)](#), in partnership with [OCHCO](#) and leaders across the Agency, leads the effort to create a workforce that is as diverse as our nation's population, and equitable and inclusive to promote optimal productivity and mission-readiness.



See the vision for the Future of Work at NASA.



Visit the Future of Work intranet site now!

Learn more about the FoW at NASA:

- FoW Driving Principles
- FoW Objectives
- FoW Next Steps
- FoW Webinars & Training

Improving How We Work, Together

Connecting Capabilities to Enhance the Mission Support Enterprise

Throughout 2021, MSD engaged missions and centers in **requirements-gathering conversations** to understand bright spots and pain points in the support enterprise. The culmination of that data collection is a **suite of enterprise-enabling capabilities** that will help mature service development and delivery:

- [MSTO](#) is currently drafting a ConOps that will inform a new and improved approach to enterprise-wide collaboration, that focuses on mission requirements and center conditions.
- In 2021, [MSTO](#) stood up the Risk Management Working Group to assess submitted risks across mission support and integrate them into the FY22 Planning, Programming, Budgeting & Execution (PPBE) cycle in collaboration with the [Mission Support Resources Management Office \(MS RMO\)](#).
- [MSTO](#) produced the [Mission Enabling Change Management Framework](#) and established the Mission Enabling Change Network to support implementation of effective change practices across the agency.
- The Strategy & Integration Office was absorbed into [MSTO](#) to better integrate strategic initiatives and transformational activities.
- [MSTO](#) kicked off the IT Transformation Strategy, which will continue into 2022.



Visit the Mission Enabling Change Management page.

Risk Management Process



Click to enlarge.

Creating Connections to Enhance Work

Mission support will only be right-sized and fulfill its efficiency and effectiveness goals when it is inextricably **interconnected with mission requirements and leverages tools and talent from across the support enterprise**. Therefore, enhancing the mission support enterprise must be a collaborative activity between MSEOs, missions, and centers. In 2021, MSD took steps toward providing the **connective tissue** that would enable the right collaborations, co-creations, and conversations to provide direction, governance, and accountability:

- [MSTO](#) is establishing the Transformation CoP to gather a cross-section of capability leaders who can collaborate on solutions and share best practices.
- [MSTO](#) is leading the redesign of the MSPMC and MS Forum to provide value-adding opportunities to address the most pressing issues and concerns for customers and mission support.
- [MSTO](#) is establishing performance metrics and a performance management framework that will influence the Baseline Performance Review process and integrate with the PPBE and Risk Management cycles, to support a fully integrated support enterprise.

Capturing Critical Insights in Graphics

The MS Forum in December 2021 yielded terrific inputs from support customers and MSEOs. These dialogues were captured by a graphics specialist whose note-taking allows attendees to look back over the discussions and glean additional insights.

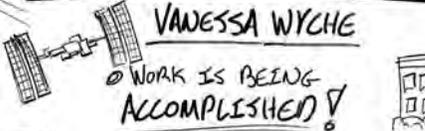
MISSION SUPPORT FORUM 2021

DAY 1

WELCOME TO JSC

VALESSA WYCHE

WORK IS BEING ACCOMPLISHED!



ISS! COMMERCIAL LOW EARTH ORBIT!

ORION (MATES I)

- PROGRAM MANAGEMENT
- STREAMLINE PROCESSES
- UNITE ACROSS CENTERS, AGENCY, ACADEMIA, INTERNATIONAL

DAREY UNITE EXPLORE

HOW DO WE MAKE PARTNERSHIPS EASIER?

6 MONTHS → 1 MONTH!

SPACE IMPRESSION FROM BOCA CHICA VISIT: EMPOWERING THE JUNIOR WORKFORCE

SHOW OUR CARDS TRANSPARENCY!

WHAT INFRASTRUCTURE DO WE NEED?

WHAT DOES SUCCESS IN THE FIRST TERM LOOK LIKE?

ADJUST TO CHANGING AEROSPACE LANDSCAPE

WHAT IS OUR ROLE AS AN AGENCY?

ADMINISTRATION PRIORITIES & NEW OFFICES

CASEY SWAILS

FOCUS ON CLIMATE

COVID? RETURN TO ON-SITE

DELIVER ON WHAT WE ASK FOR!

CONNECT TO FUTURE OF WORK

JANUARY A-SUITE OFFSITE

NASA 2040

LEADERSHIP OFFSITE KSC IN FEBRUARY

WHAT IS THE ROLE OF A CIVIL SERVANT?

BUDGETS SQUEEZED - HOW DO WE RIGHT-SIZE?

INVEST IN THE RIGHT TECHNOLOGY

PAY ATTENTION TO OUTSIDE NOT JUST INSIDE

OTHER COMPANIES ARE PUSHING AUTHORITY AND RESPONSIBILITY DOWN? "YES, IF...?"

EXPECTATIONS FOR THE WEEK

BOB GIBBS

MARY DAVIE

BALANCE THE MESSAGE? WE'VE DONE A DAMN GOOD JOB!

1. HOW DO WE DO OUR JOB BETTER?

2. HOW DO WE BUILD A TEAM? WORK TOGETHER TO DELIVER SERVICES!

HOW DO YOU REPLICATE SUCCESS?

DEFENSE ACTIONS INTO 2022?

BIG ASK: CONNECT TO MISSION!

FIGHT FOR YOUR PLACE AT THE TABLE!

ANDREW MILLER 12/13/2021

OPENING CONTEXT

ASTRONAUT BOB BEHNKEN

WHO TO TAKE PICTURES OF THE EXTERNAL TANK

SECOND SHUTTLE FLIGHT AT NIGHT

TURNED 50 IN SPACE (EARLY YEAR!)

ASSEMBLED THE STATION

FOUR SPACEWALKS TO REPLACE ISS BATTERIES!

SHOULD BE PROUD OF WHAT WE ACCOMPLISHED IN 2020!

KNOW WHAT THE OTHER PERSON'S JOB IS

CULTURE SHOCK!

RESOLVE CONFLICTS TO FLY THE MISSION!

BUILT RELATIONSHIPS BY SPENDING TIME AT THE OFFICE

TAKEAWAYS

CONVERSATIONS & TRUST ARE IMPORTANT!

INDIVIDUATION? RECOGNIZE YOUR STRENGTHS & WEAKNESSES

FIGURE OUT WHAT YOUR ORG NEEDS AND BE THAT

POINT TO HELP

DON'T NEED ROCK STARS... NEED TEAMS TO BE SUCCESSFUL OVER EXTREME CAMPAIGN

ALL OF US NEED TO BE AGILE & FLEXIBLE

DAY 2

FUTURE OF WORK

MELANIE SAUNDERS

PEOPLE SHOULD HAVE A CHOICE OF IN-PERSON OR VIRTUAL

FLEXIBILITY IS THE KEY

NOT EVERYONE IS THERE YET?

"I'M NOT GOING..." IS NOT THE RIGHT ATTITUDE!

INFRASTRUCTURE FOW IS FIRST STEP IN OUR FUTURE INFRASTRUCTURE NEEDS

WE DON'T NEED MORE OFFICES!

PERSISTENCE IS ALSO IMPORTANT

AT FIRST, HYBRID MEETINGS MAY SUCK

FLEXIBILITY BASED ON JOB NEEDS AND REQUIREMENTS

WE DON'T KNOW EXACTLY WHAT THE FUTURE LOOKS LIKE

RATING: ★★★★★ BUILDS A GREAT EXPERIENCE FOR ALL EMPLOYEES

EMPLOYEES ARE HAPPY WITH THE IDEA OF FLEXIBILITY

HYBRID

GIVE TIME BACK TO YOURSELF?

MISSION SUPPORT FORUM 2021

DAY 3

HUMAN CAPITAL

- SHARING DATA TO MAKE DECISIONS, SHOWING BOTTLENECKS
- SHARING THE DASHBOARDS
- DATA HELPS US UNDERSTAND OUR OWN SERVICES
- DISCUSSION OF CURRENT NEEDED ON STAFFING ACTIONS
- HELP US ANALYZE THE UNDERSTANDING OF WHERE WE ARE

COMMUNICATIONS

- STRATEGY DRIVES PRIORITIES
- NAVIGATING MULTIPLE BOSSSES, DEVELOP OUR COMMS LEADERS TO DO THIS
- CASE FOR CHANGE FOR STRATEGIC COMMS
- WORK TOGETHER AS A FAMILY!

OCIO TECHNOLOGY

- FOUNDED MODEL CHANGES
- CAPTURE LESSONS LEARNED ON PROCESS CHANGES
- COMMUNICATE & AUTOMATE
- BASE & DEMAND STRUCTURE FOR FUTURE OF WORK

CONOPS & ROLES CONVERSATION

EXCHANGE WITH YOUR FUNCTIONAL LEADS AND LET THEM KNOW WHAT IS HAPPENING -

SUBJECT THE BALL OF CENTER AD: MISCOMMUNICATION TO AVOIDANCE

ENTERPRISE OPTIMIZATION

HOW MUCH VARIABILITY CAN WE TOLERATE?

WHO DOES WHAT?

WE NEED: 3-4 BARRIERS AT MESO LEVEL

RISK INFORMED FUNDING DECISIONS ACROSS THE ENTERPRISE

AD: ENTERPRISE TOOLS TO MESO

ALIGNED TO STRATEGIC GOALS

WHAT IS THE AD ROLE?

TWO DIMENSIONS OF BUDGET:

AD: MESSAGING

AD: OPERATIONAL

AD: SUPPORT

AD: LOCAL

AD: SUPPORT STAFF

AD: CRITICAL COMMUNICATOR

WHAT DID WE MISS?

THE (LOW)!

WE WOULD LOVE THIS!

WE WOULD LOVE THIS AND ALSO... BUT OTHER AGENTS ARE ON THE SAME SHEET OF MUSIC!

NOT ALL MESSAGES ARE PRESENT IN THE CONVERSATION

MUST-DOS:

- BRING MESSAGES TO THE CONVERSATION
- SHARE MESSAGES NOT AWARE OF CENTER OPERATIONS

PROPRIETIZE CUSTOMER FIRST?

MESSAGE THE ART OF THE POSSIBLE

VALUE OUR EMPLOYEES?

REPAIR TO ON-TOO

REQUIREMENTS OF THE 3RD AND MESSAGING EXECUTION

COMMUNICATE, COMMUNICATE, COMMUNICATE

ACCOUNTANTS BE DEFERENT THAN ASTRONAUTS?

REUSE & UPDATE NPRs & APODs

BASED BUSINESS KUMEN CAPACITY: DEVELOP CUSTOMER SERVICE ATTITUDE & BEHAVIORS

REPAIR THE MESSAGE NEEDS TO BE A LITTLE MORE... HONEST?

REBRAND FUTURE OF WORK (LET US NOT WORK FROM HOME)

MISSION SUPPORT FORUM 2021

KEY THEMES

MISSION SUPPORT FOR MISSION SUCCESS

CUSTOMER SERVICE

WORKING TOGETHER

FLEXIBILITY & AGILITY

COMMUNICATION

PRIORITIZATION

MANAGE RISKS

TRANSPARENCY

TAKING CARE OF OUR PEOPLE

COMMON LANGUAGE & TECHNOLOGY

TRUST

ENTERPRISE TEAMS

CLARIFY ROLES & RESPONSIBILITIES

WHAT NASA DOES?

INTERNAL COMMS

ART OF THE POSSIBLE

ISSUES

BUDGET

ACTIONS

MAKING TRADES

RESOURCES

MISSION SUPPORT

USE DATA TO INFORM DECISIONS AND SUPPORT STAKEHOLDERS

NASA

MARS

MOON

COMMUNICATE

MANAGE RISKS

TAKING CARE OF OUR PEOPLE