

The background of the cover features a light gray grid of squares. On the right side, there is a complex network of white lines and circles of varying sizes, some of which are hollow and some are solid, creating a sense of connectivity and data flow. The text is centered in the lower half of the page.

MITRE
ANNUAL
REPORT
2016

Ours Is a Higher Ambition

Our Vision

To create a stronger nation and a better world by contributing to breakthroughs in safety and security.

Our Mission

One public-interest company, working with industry and academia to advance and apply science, technology, systems engineering, and strategy, enabling government and the private sector to make better decisions and implement solutions to complex challenges of national and global significance.

Our Goals

- Deliver transformational solutions that drive mission success and advance global leadership
- Set the standard for systems engineering excellence around the world
- Be a world-class organization



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2016 at
a Glance





Alfred Grasso

Letter from the President and CEO

The phrase “global village,” popularized many years ago now, did not begin to describe how much the world would be interconnected. A challenge in one country now presents a challenge for the world. In cyberspace, on the battlefield, in hospitals, cities, courts, financial systems, in the air and beyond, we are truly a global ecosystem.

MITRE is uniquely qualified to meet the challenges of today’s world. With our own ecosystem of seven federally funded research and development centers, we are able to look across the federal government and the globe to the benefit of all of our sponsors. We serve as an innovation bridge—connecting sponsors to sponsors, solutions to problems, technology to industry, and partners to opportunities.

This year our sponsors celebrated a number of significant accomplishments. Whether safeguarding the United States from missile debris, protecting our assets in physical space and cyberspace, empowering patients and veterans, increasing the speed of justice and the economy, or ensuring safe and secure air travel, MITRE was instrumental in helping our sponsors achieve mission success.

Our Innovation Program is the cornerstone of these successes, and we continue to break new ground as we seek to solve the problems of tomorrow today. This year’s MITRE Challenge of Countering Unauthorized Unmanned Aircraft Systems (UAS) brought participants from around the world, and we’ve just recently launched our second challenge on the Unique Identification of Internet of Things Devices.

This year also marked change within our organization: our Board named Dr. John Hamre, former U.S. Deputy Secretary of Defense, to serve as Chairman. John has served on the Board since 2000, and he has brought to MITRE a remarkable understanding of national security issues at the highest levels. MITRE will be well served by his deep knowledge and experience. John succeeds The Honorable Charles Robb, who is retiring after 15 years with MITRE—service that came after a distinguished political career of more than a quarter century. We will miss his wisdom and guidance and are grateful for his service.

Finally, we were pleased to open the doors to our newest McLean campus building in 2016. MITRE 4 is a modern, green facility with cutting-edge laboratories and collaborative spaces for employees and guests.

In the pages ahead, we take a closer look at the challenges of 2016 and beyond and our contributions to our sponsors’ and international partners’ successes within this global ecosystem in which we work.

Regards,

A handwritten signature in black ink, appearing to read "Alfred Sur". The signature is fluid and cursive, with a long horizontal stroke at the end.

We Operate FFRDCs

MITRE manages a powerful ecosystem of federally funded research and development centers (FFRDCs) for multiple U.S. government sponsors to solve global challenges. Operating multiple FFRDCs across the federal space allows us to share capabilities, solutions, and innovations to the benefit of all our sponsors and the public.

- National Security Engineering Center (DoD)
- Center for Advanced Aviation System Development (FAA)
- Center for Enterprise Modernization (Treasury/IRS/VA)
- Homeland Security Systems Engineering and Development Institute (DHS)
- Judiciary Engineering and Modernization Center (Federal Judiciary)
- CMS Alliance to Modernize Healthcare (CMS/HHS)
- National Cybersecurity FFRDC (NIST)

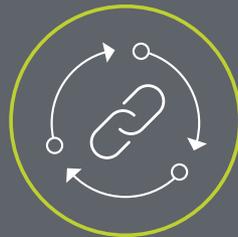
Federal Acquisition Regulation 35.017: Federally Funded Research and Development Centers

An FFRDC meets some special long-term research or development need that cannot be met as effectively by existing in-house or contractor resources. FFRDCs enable agencies to use private sector resources to accomplish tasks that are integral to the mission and operation of the sponsoring agency.

FFRDC Differentiators



We are a
not-for-profit
organization



We have
continuity
and depth



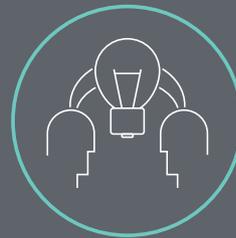
We are
chartered in
the public
interest



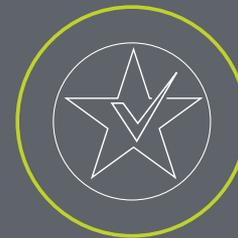
We are free from
organizational
and commercial
conflicts of
interest



We form long-
term, strategic
partnerships
with industry,
academia, and
governments



We are an
innovation
bridge

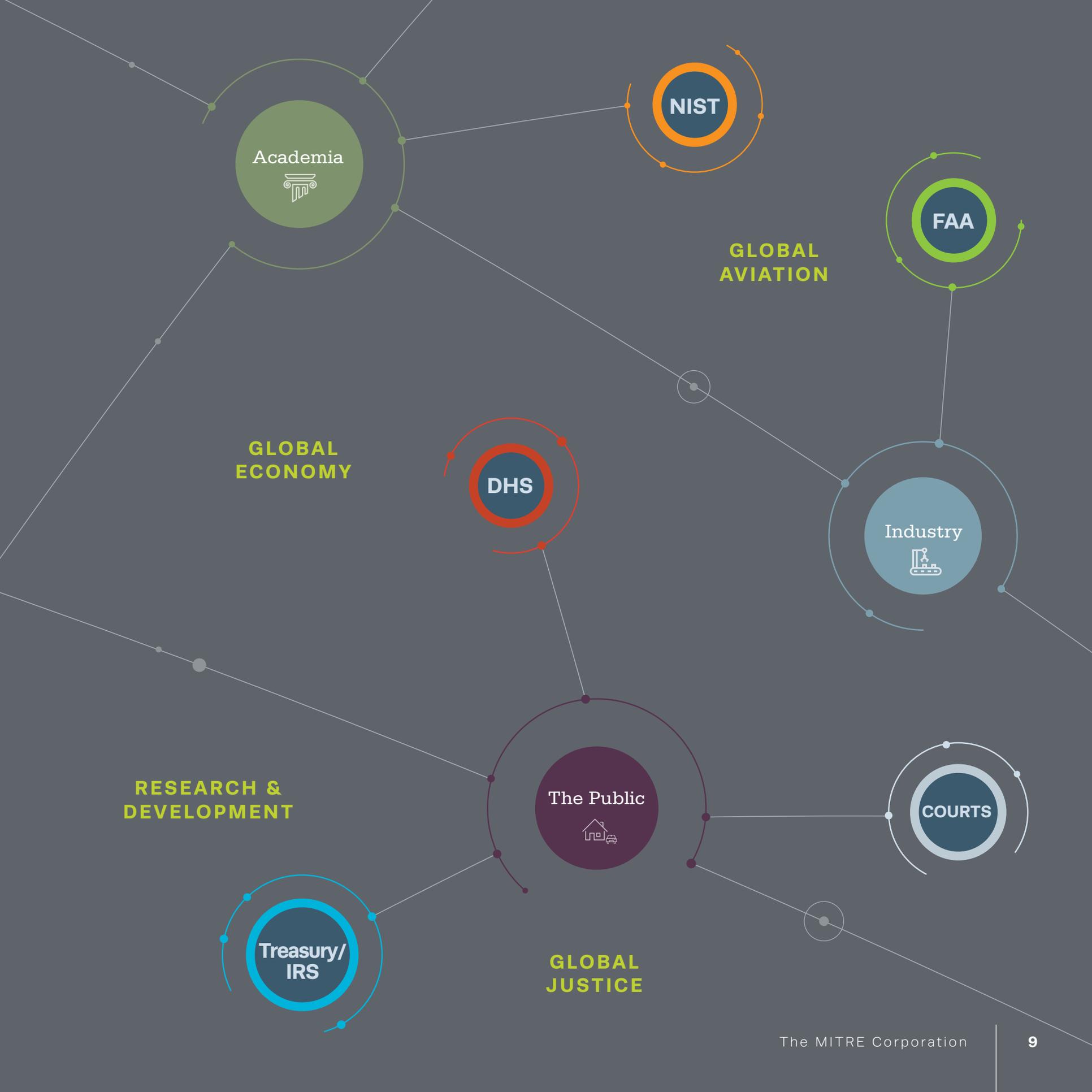


We are
committed to
excellence and
integrity above
all else

We work in a global ecosystem:

Our modern FFRDCs help connect government and the world









Mission Achievements, Global Challenges

Many of the hardest and most FFRDC-worthy challenges span programs and sponsors. To solve these challenges, we help our sponsors harness the advances happening outside their walls and collaborate in partnership with stakeholders across industry, academia, and other nonprofits in the United States and around the world.

Digital Communications for Safer Skies

In 2016, the FAA began rolling out a safer and more efficient

information exchange between air traffic controllers and pilots.

Through the Data Communications Program—or Data Comm—the FAA is now supplementing its voice-based communication system with data capabilities.

MITRE worked with the FAA and the aviation community to develop the operational concepts and procedures and the requirements for these Data Comm capabilities. We also performed operational testing to help ensure the successful integration and use of data communications throughout U.S. airspace.

In 2016, the FAA provided Data Comm capabilities for use at 56 airports across the country. This has already resulted in shorter communication times, faster taxi-outs, and reduced delays. By the end of 2018, as many as 2,400 aircraft will be equipped with Data Comm capabilities. In 2019, the FAA plans to implement Data Comm services in its high-altitude air traffic control centers, extending the advantages of these services even further. ■



This **transition**
has already
resulted in
reduced delays





2,400
aircraft
will be
equipped with
Data Comm
capabilities by
2018



Tapping the Potential of "New Space" Capabilities

Constellations of commercial satellites are imaging Earth

with increasing frequency and accuracy. They're providing content for navigation systems, business analytics, and global economics. This has led to a "New Space" vision: diverse commercial satellite imagery and analysis as low-cost commodities available to all.

Multiple government agencies are seeking to tap the potential of New Space. The possibilities are far-reaching: mission planning, reconnaissance operations, disaster relief, resource conservation, and transportation security. MITRE is playing a vital role in helping the government take advantage of this emerging market's promise.

MITRE is providing technical modeling and analysis to help government sponsors decide how and when to incorporate commercial space into their overall missions, investments, and acquisition strategies. We are also developing mission-driven analytics to add mission value from commercial offerings. We're piloting these in operational prototypes to address novel applications for our nation's most challenging problems. ■



**1,100 active
satellites are
currently
orbiting Earth**

Combating the Growing Threat to Our Space Assets

Today, the United States must be prepared for attacks on our national security space systems as they travel through space. China's recent demonstrations of anti-satellite weapons are the most visible examples of the emerging threats to our space assets.

In response, the Air Force Space Command (AFSPC) asked for MITRE's help in creating a Space Enterprise Vision (SEV) outlining how the military should address the increasing dangers to communications, navigation, and other space-based capabilities. The AFSPC brought together a team of FFRDCs to support that effort, asking MITRE to serve as co-lead.

In October 2016, the team delivered the SEV to AFSPC, and it quickly gained acceptance across senior levels of the DoD and intelligence community. The SEV is now being used to guide planning choices, resource decisions, and requirements development across the DoD and the intelligence community. ■

AFSPC, MITRE,
Aerospace Corp.,
Lincoln Lab, and
RAND helped create
a **Space Enterprise
Vision**



Space assets include communications, navigation, surveillance, meteorological sensing, and threat detection



Transforming Indonesia's Aviation System

In 2015, Indonesia launched an effort to modernize all aspects of its civil aviation operations. The International Air Transport Association (IATA) predicts that Indonesia will become one of the world's 10 largest passenger markets by 2020 and the fifth largest domestic market by 2034. Indonesia's modernization program will therefore have long-term benefits.

The initiative—known as Indonesia Modernization of Air Navigation Services (IMANS)—calls for developing new operations concepts, implementing advanced air traffic management systems, updating procedures, and better integrating Indonesia's operations with those of other nations in the region.

Starting in November 2015, MITRE worked with AirNav Indonesia—the country's air navigation service provider—to expedite the identification and deployment of the capabilities needed to fulfill the IMANS vision. In September 2016, MITRE provided a comprehensive concept of operations for the modernization effort. ■



IATA predicts that **Indonesia** will become one of the world's **10 largest passenger markets** by **2020**



MITRE's work in the **Asia Pacific** region is helping deliver **harmonized aviation solutions**

Judicial Analytics Creates Cost Savings

Under the federal district court's **Multidistrict Litigation (MDL) system**, all pending civil cases of a similar type are transferred to a single judge. In some MDLs, a court can receive upward of 6,000 new filings each day and face a backlog of up to 80,000 pending complaints.

To better manage its own cases, one MDL court sought to capture pertinent items of data from each pending case file. This effort, the Office of the Clerk determined, would require 14 new staff, take four months to complete, and cost \$400,000. The challenge was that the case documents are processed as PDF files, a format from which most automated systems cannot reliably retrieve specific data.

That's where MITRE's expertise and independent status came in. After one week, nearly 95 percent of the desired data was compiled, eliminating the need for the costly solution the MDL court had originally anticipated. ■



A court can
receive upward of
6,000 new filings
each day

parent of the following child(ren):

Signature _____

Statement _____

to care for the children in medical, or other services that the children may need.



SAMPLE CUSTODY and VISITATION ORDER

COMMONWEALTH OF PENNSYLVANIA

Division _____

Plaintiff _____

Defendant _____

AND NOW, the Court, after hearing the testimony of the parties, the testimony of the witnesses, and the testimony of the Court, do hereby order that the custody and visitation of the child(ren) named herein be as follows:

ORDER

NOTICE

To _____

Presented to the Court of the Commonwealth of Pennsylvania, County of _____, on this _____ day of _____, 20____.

The reason for this writ is that _____



Form **4506-T**
 (Rev. September 2015)
 Department of the Treasury
 Internal Revenue Service

Request for Transcript of Tax Return

- ▶ Do not sign this form unless all applicable lines have been completed.
- ▶ Request may be rejected if the form is incomplete or illegible.
- ▶ For more information about Form 4506-T, visit www.irs.gov/form4506t.

CMB No. 1545-1872

Tip. Use Form 4506-T to order a transcript or other return information free of charge. See the product list below. You can quickly request transcripts by using our automated self-help service tools. Please visit us at IRS.gov and click on "Get a Tax Transcript..." under "Tools" or call 1-800-908-9946. If you need a copy of your return, use Form 4506, Request for Copy of Tax Return. There is a fee to get a copy of your return.

1a Name shown on tax return. If a joint return, enter the name shown first.	1b First social security number on tax return, individual taxpayer identification number, or employer identification number (see instructions)
2a If a joint return, enter spouse's name shown on tax return.	2b Second social security number or individual taxpayer identification number if joint tax return
3 Current name, address (including apt., room, or suite no.), city, state, and ZIP code (see instructions)	
4 Previous address shown on the last return filed if different from line 3 (see instructions)	
5 If the transcript or tax information is to be mailed to a third party (such as a mortgage company), enter the third party's name, address, and telephone number.	

Caution: If the tax transcript is being mailed to a third party, ensure that you have filled in lines 6 through 9 before signing. Sign and date the form once you have filled in these lines. Completing these steps helps to protect your privacy. Once the IRS discloses your tax transcript to the third party listed on line 5, the IRS has no control over what the third party does with the information. If you would like to limit the third party's authority to disclose your transcript information, you can specify this limitation in your written agreement with the third party.

- 6 Transcript requested.** Enter the tax form number here (1040, 1065, 1120, etc.) and check the appropriate box below. Enter only one tax form number per request. ▶
- a Return Transcript**, which includes most of the line items of a tax return as filed with the IRS. A tax return transcript does not reflect changes made to the account after the return is processed. Transcripts are only available for the following returns: Form 1040 series, Form 1065, Form 1120, Form 1120-A, Form 1120-H, Form 1120-L, and Form 1120S. Return transcripts are available for the current year and returns processed during the prior 3 processing years. Most requests will be processed within 10 business days.
 - b Account Transcript**, which contains information on the financial status of the account, such as payments made on the account, penalty assessments, and adjustments made by you or the IRS after the return was filed. Return information is limited to items such as tax liability and estimated tax payments. Account transcripts are available for most returns. Most requests will be processed within 10 business days.
 - c Record of Account**, which provides the most detailed information as it is a combination of the Return Transcript and the Account Transcript. Return information is limited to items such as tax liability and estimated tax payments. Record of Account transcripts are available for the current year and 3 prior tax years. Most requests will be processed within 10 business days.

Protecting Taxpayer Identities

As Americans increasingly rely on the Internet for their business transactions, the amount of personal information accessible online has grown substantially, making it vulnerable to hacking.

Many users' business transactions require copies of their tax returns. The IRS therefore offers a service, Get Transcript, to enable users to quickly obtain copies of their tax transcripts online. This past year, when the IRS was strengthening the security features of the Get Transcript application, it called on MITRE to evaluate the system's security to assess its readiness for deployment.

MITRE's cybersecurity experts tested all components of the Get Transcript system as well as its supporting eAuthentication service, which verifies the user's identity, and identified a few areas for improvement. In particular, we recommended the use of the latest multi-factor authentication techniques to prevent unauthorized access. The IRS acted on MITRE's independent recommendations, thus providing greater protections for taxpayer data. Taxpayers everywhere are the beneficiaries of the IRS's and MITRE's diligence. ■



In 2015, almost **300** million records were **leaked**, and more than **\$1 billion** was stolen worldwide by cyber hackers



Get Transcript enables users to obtain their **tax transcripts online**



Analyzing Social Media to Prevent Terrorist Attacks

In December 2015, homegrown extremists inspired by a foreign terrorist group killed 14 people and injured 22 others in an attack in San Bernardino, California. How were they inspired? Via social media and the Internet.

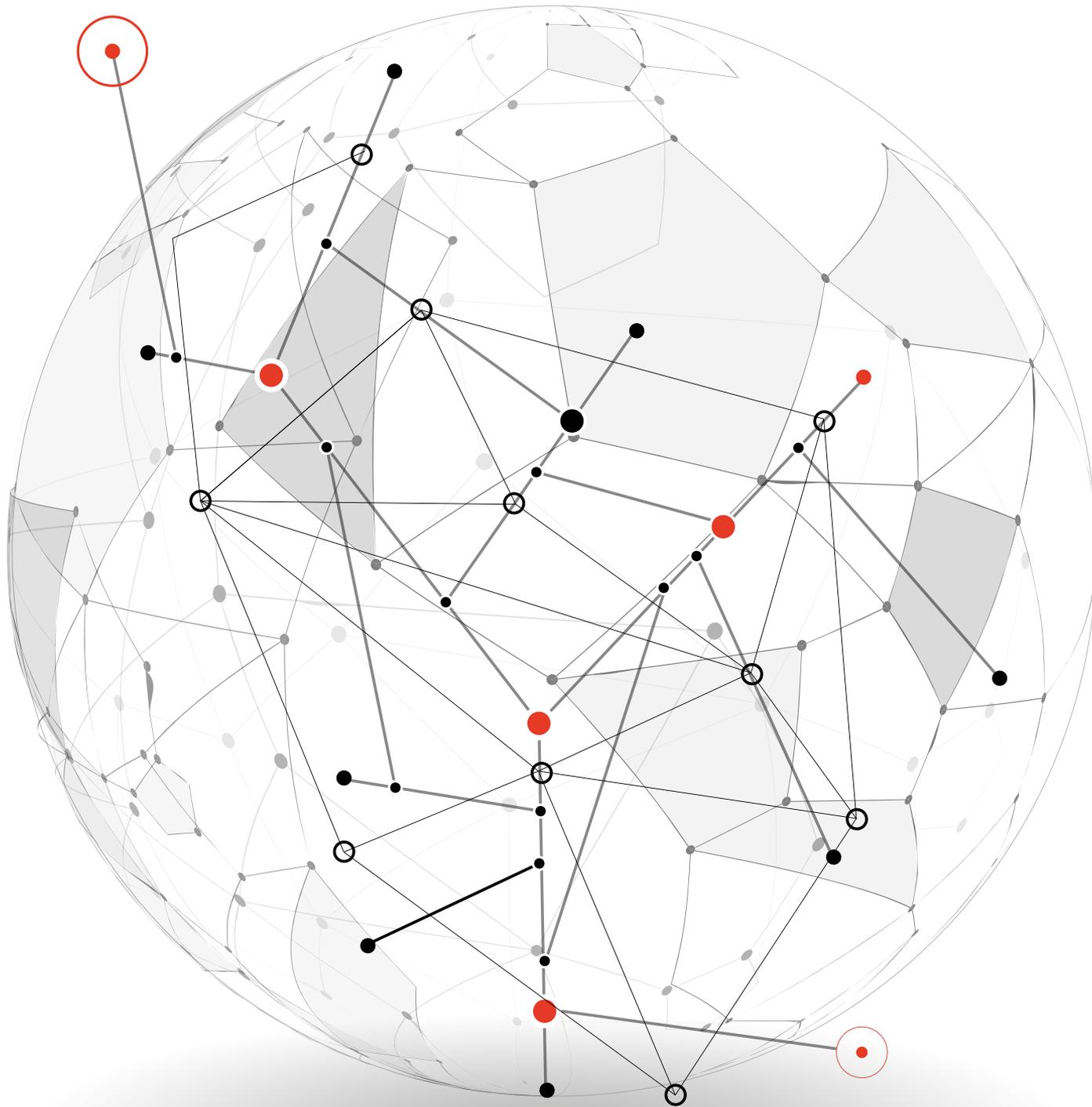
To help prevent such attacks both at home and abroad, the federal government immediately created a team to examine how social media analytics could be applied to the screening and vetting of individuals traveling or seeking immigration benefits. The team included personnel from DHS, the U.S. Citizenship and Immigration Services, and the MITRE-operated Homeland Security Systems Engineering and Development Institute (HSSEDI™) FFRDC.



Facebook has over **1.7 billion** active users

The team members used their knowledge of media, international social media sites, and language processing to review open source and social media analytic capabilities and technologies. Ultimately, they evaluated more than 270 social media tools for their potential for addressing critical mission areas. They highlighted solutions for accessing some 30 social media platforms on the Internet and darknets, using data sets in more than 120 languages. They also discovered problems with existing analytic capabilities, which were quickly improved for government agencies' use.

The team's work is now serving as the national testbed for establishing the DHS Social Media Center. Their work also helped DHS improve its capabilities, achieve operational efficiencies, and lower costs through the automation of advanced analytics, thereby advancing the agency's overall goals. ■





Enabling Big Changes in Medicare Payment

In October 2016, the Centers for Medicare & Medicaid Services (CMS)

released rules overhauling how the agency pays physicians and other clinicians. Called the Quality Payment Program, the new approach rewards the delivery of high-quality care through two interrelated pathways: Advanced Alternative Payment Models (APMs) and the Merit-based Incentive Payment System (MIPS).

MITRE provided CMS with strategic guidance for the design of MIPS, which rewards quality and efficiency improvement efforts and the use of electronic health record technology. We also contributed to the development of the Advanced APMs, which provide added incentives to deliver high-quality and cost-effective care.

Recognizing that true delivery system reform requires working with a range of healthcare stakeholders, CMS asked MITRE to convene the Health Care Payment Learning and Action Network, which includes health plans, providers, patients, employers, consumers, states, federal agencies, and other partners. These stakeholders are now working together to promote the adoption of alternative payment models to achieve better care and smarter spending. ■



2017 brings
**merit-based
incentives** for
clinicians

Using Data to Defeat Drug Fraud

Approximately 78 Americans die every day from opioid overdoses. More than half of these deaths stem from the misuse of prescription opioid pain relievers. Federal and state government agencies have launched a variety of efforts to address the opioid abuse epidemic. One of these, the Prescription Drug Monitoring Program (PDMP), gives individual states the ability to collect data about controlled substance transactions.

MITRE researchers saw the PDMP as a means to identify prescription fraud schemes involving patients, prescribers, and pharmacies. A MITRE team worked with the state of Indiana to apply advanced analytics to more than 12 million transactions registered with the Indiana Board of Pharmacy.

They used that information to create two Web-based tools. One assists prescribers in determining a patient's risk of drug-seeking behavior to help catch "doctor shoppers." The other scores providers for potential fraud to help predict where fraud is most likely to occur. Preventing more fraud and abuse will save more lives. ■



**As much as
\$72 billion**
a year goes
toward drug
addiction
treatment



Approximately

78

Americans die
every day from
opioid
overdoses



Applying Safety Science to Child Welfare

Every year, as many as 2,000 U.S. children die as the result of abuse or neglect. MITRE is partnering with the Department of Health and Human Services (HHS) to prevent these tragic deaths through data sharing and analysis.

MITRE has already successfully partnered with government and industry to use an information sharing and analysis approach to improve aviation safety and to prevent avoidable patient safety events in medical facilities. To achieve these outcomes, we collect data from a variety of sources and analyze it to identify safety issues.

We are conducting an analysis for HHS to assess the potential benefits of this approach in the field of child welfare. While our long-term vision is to develop national partnerships for the sharing of child welfare and related data, we are also working at the local level. For example, we are collaborating with the County of San Diego's Health and Human Services Agency to develop a system to collect and analyze child welfare, medical, and substance abuse data. Our effort there is generating important insights and will help to refine our efforts and approach at the national level. ■

MITRE is partnering with HHS to prevent tragedies through data sharing and analysis



Every day,
4 to 8
children in
the **U.S. die**
from abuse or
neglect

Cyber Lab Helps Secure the “Smart Home”

In 2016 MITRE worked with the National Institute of Standards and Technology (NIST) to create a state-of-the-art lab at the National Cybersecurity Center of Excellence (NCCoE) to address the threats to security and privacy posed by the Internet of Things (IoT).

The term “IoT” refers to devices equipped with software, sensors, and effectors networked with one another via the Internet. Although these networked devices can improve efficiency in the home, they also carry security risks. The new Consumer IoT Initiative (CITI) lab functions as a simulated smart home to enable researchers to explore these challenges. Leveraging MITRE’s trusted adviser role, researchers can then develop strategies for securing consumers’ security and privacy, as well as countermeasures to address the adverse impact a large group of compromised IoT devices can have on the Internet itself.

CITI is now fully operational and welcomes research topics from industry, NIST, and other sponsors. Results from the lab’s experiments will inform and enhance NCCoE’s efforts to help U.S. industry apply secure technologies that enable consumers to enjoy the many benefits of a smart home without sacrificing security and privacy. ■



**IoT: MITRE helps
balance benefit
and risk**





More than
4.6 million
veterans live
in rural areas



Assisting Veterans in Rural Areas

The Veterans Health Administration (VHA) asked MITRE to come up with a system that would improve the provision of care to the 30 percent of the nation's veterans who live in rural areas—a setting with unique healthcare challenges.

In response, MITRE helped create and pilot a system focused on rural veterans receiving home healthcare. Today, the Department of Veterans Affairs (VA) contracts with home health agencies for these services. Coordinating that care is a manual process involving paper forms and phone calls. This often results in missed communications, inconsistencies in the patient record, and delays in the provision of care.

To address these issues, MITRE automated the process in a secure Web-based environment to enable VA and home health providers to electronically share plans of care, record patient observations, reconcile medication discrepancies, and facilitate the communication of additional orders. This pilot is demonstrating the “art of the possible” for managing care in the community, reducing costs, and improving patient safety, and it positions the VHA as a national leader in moving toward patient-centered plans of care. ■

MITRE is helping demonstrate the “**art of the possible**” for managing care

Patching Vulnerabilities in Our Digital Infrastructure

The recent denial-of-service attacks on the Internet routing company Dyn shut down major swaths of the Internet, exposing vulnerabilities in our digital infrastructure. What if the targets had been the power grid or the financial sector?

To safeguard the nation from such scenarios, MITRE works with NIST to accelerate the adoption of advanced security technologies. MITRE is helping the National Cybersecurity Center of Excellence (NCCoE) to engage new collaborators to drive awareness and promote early adoption of new technologies and standards. In 2016, we assisted NCCoE in publishing four practice guides on such industry-identified challenges as “Securing Electronic Health Records on Mobile Devices” and “Identity and Access Management for Electric Utilities.” Our efforts also helped NCCoE increase its key stakeholder relationships by 68 percent and garnered some 30,000 practice guide downloads.

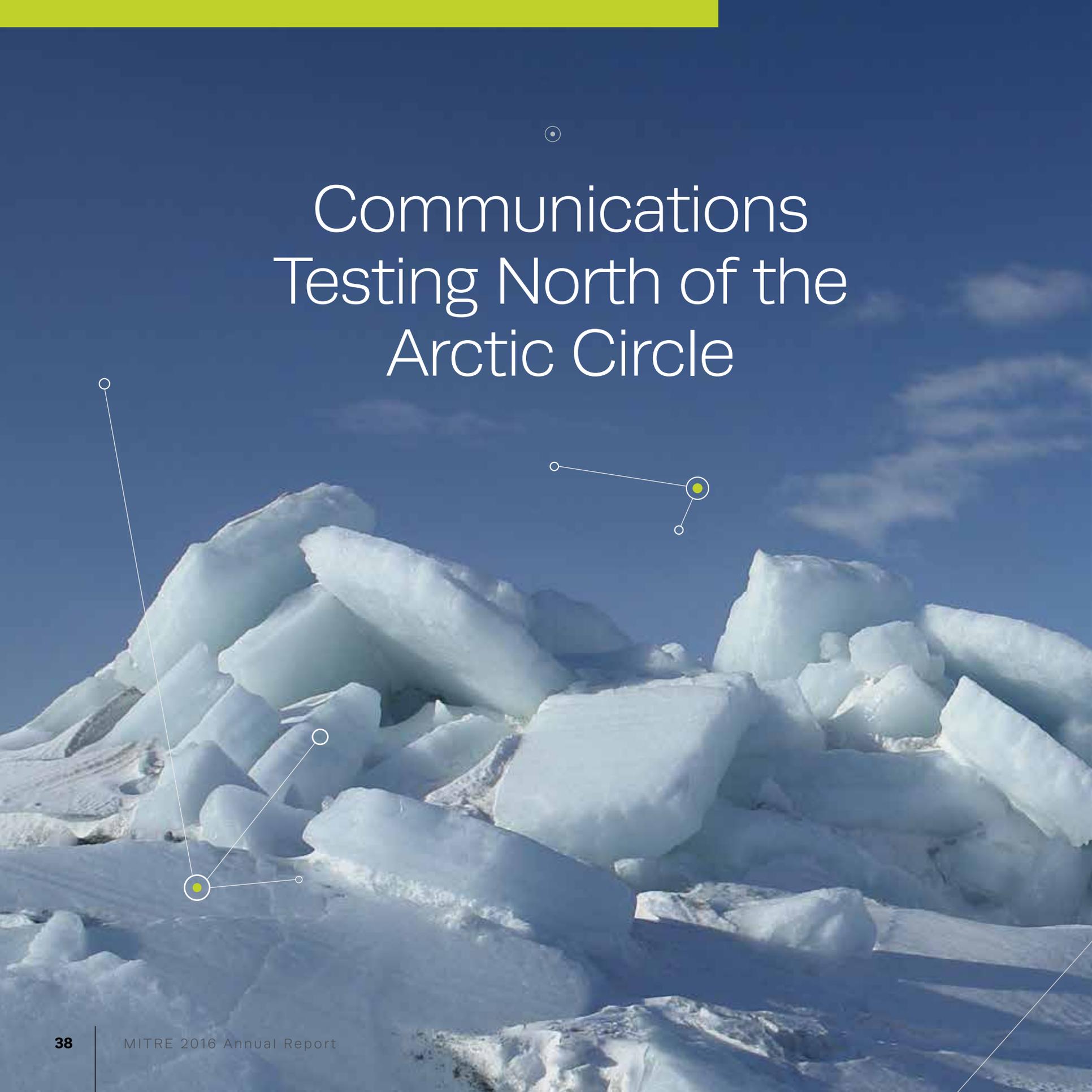
In addition, MITRE developed new ways to rapidly share NCCoE’s pragmatic solutions. For example, our video of the Attribute-Based Access Control practice guide has been viewed more than 2,000 times on the NIST YouTube channel. ■



Over
30,000 NIST
practice guides
have been
downloaded
to date



In October 2016, a **distributed denial-of-service attack** shut down dozens of popular websites

A photograph of a vast, flat landscape covered in broken ice floes under a clear blue sky. The ice floes are white and translucent, with some showing internal textures. The sky is a deep, clear blue. Overlaid on the image are several white lines and circles representing a network or communication structure. One line starts from the top left and ends at a yellow circle on the ice. Another line starts from the top center and ends at a yellow circle on the ice. A third line starts from the top right and ends at a yellow circle on the ice. There are also several other white circles connected by lines, forming a network structure across the scene.

Communications Testing North of the Arctic Circle



Communications
capabilities are
critical to potential
Arctic missions

Melting icecaps are creating access for trade routes, cruise ships, and natural resource exploration, all of which imply missions for the Department of Defense. MITRE is helping the DoD ensure that communications capabilities are available for those potential Arctic missions.

Last June, MITRE supported testing with U.S. Northern Command in Barrow, Alaska, to evaluate the performance of commercial and military communications capabilities in this demanding environment. Testing revealed several unanticipated problems, including coverage gaps, atmospheric anomalies, and unexplained interference. These problems all play havoc with the ability to establish reliable communication paths. The testing informed emergency planning for the first commercial cruise ship that traversed the Northern Passage in August.

MITRE is investing in Arctic communications research to inform communications models and identify investment areas that may include a combination of current and future commercial, military, satellite, radio frequency, and terrestrial systems. MITRE is also integrating multi-domain expertise for satellite communications, space weather, antenna modeling, and rapid prototyping to build antenna and radio capabilities to overcome the Arctic performance challenges identified during testing. ■

Technology to Protect Europe from Missile Threats



ae-gis

(/éjis/) noun:

protection,

backing, or

support

NATO Allies in Europe are under increasing threat of missile attacks

from the Middle East and others in the Eastern Hemisphere. The United States has committed to field strategically located land-based Ballistic Missile Defense interceptors as part of the European Phased Adaptive Approach to deter or counter those threats. Called Aegis Ashore, the capability integrates a maritime engagement system with a ground-based missile defense capability.

Supporting U.S. Navy and Missile Defense Agency (MDA) sponsors, MITRE provided the technical and systems engineering expertise to help field the first system—in Romania—in December 2015. MDA used a modular approach to support a relocatable capability. The Romanian deck house was assembled in New Jersey, and once a successful test firing was accomplished at a facility in Hawaii, it was disassembled, transported, and reassembled on-site in Romania.

Drawing on lessons learned from the Aegis Ashore system in Romania, MITRE is a trusted contributor and is working to help MDA build and test a second system, scheduled to go live in Poland in 2018. ■







Cutting-Edge R&D

With increasing needs in almost every area of the federal space, the public needs an understanding of emerging challenges and technologies. With digital engagement on the rise, and the rate of technology and data change increasing at explosive, exponential rates, we offer a global “whole of planet” approach to solving problems.

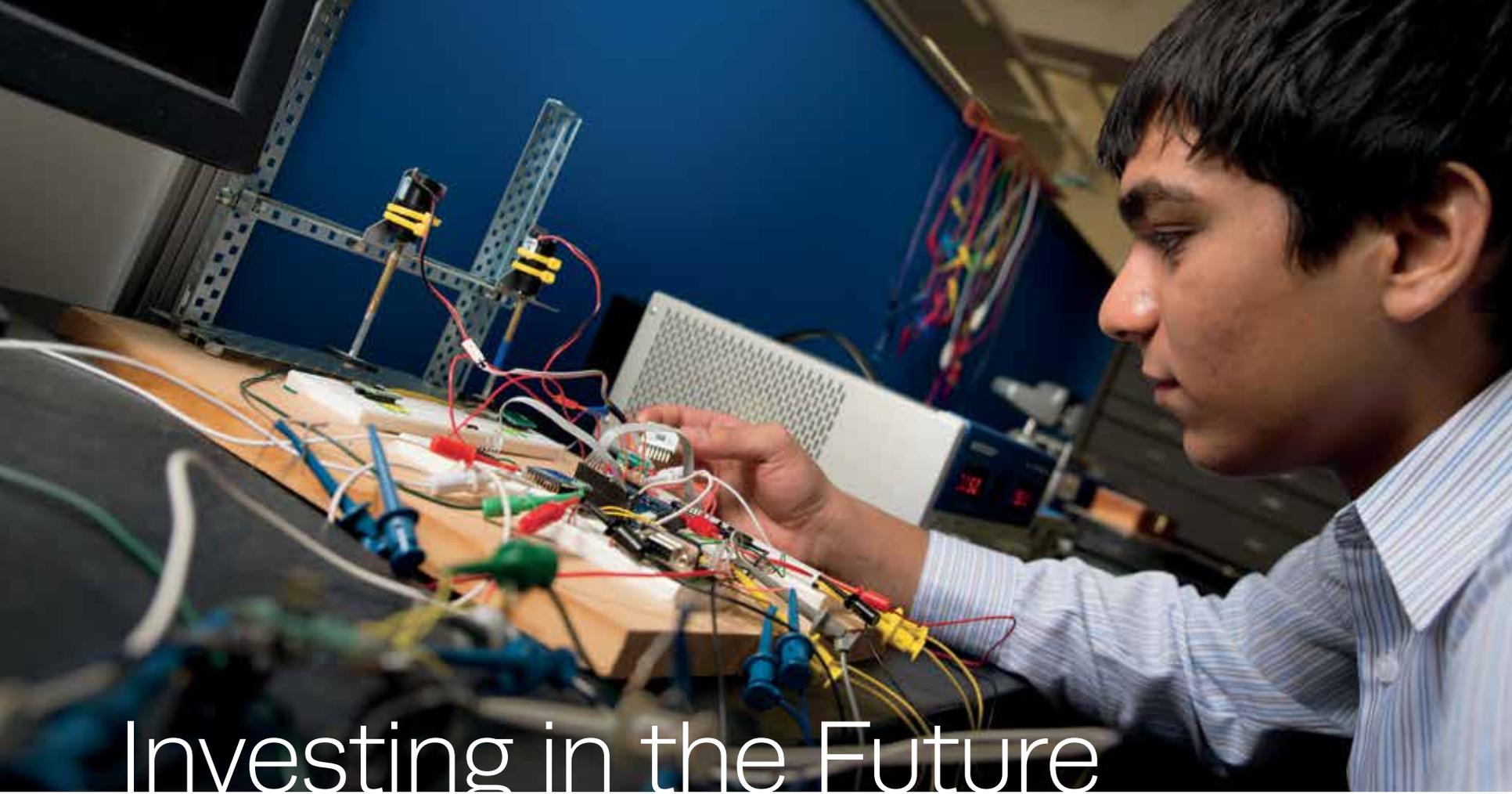
MITRE Innovation Program: Preparing for the Challenges of the Future Today

In our independent R&D program, we work in almost 100 technical fields as well as multiple domains, from air traffic control to healthcare management to cybersecurity to financial fraud. Our R&D program supports and complements MITRE's direct work for sponsors, focusing on near-, mid-, and far-term challenges. We strive to identify areas in which new technologies and capabilities can dramatically improve our sponsors' capabilities, and part of our R&D funding is devoted to exploring technologies beyond the leading edge.



MITRE's R&D program is designed to:

- Anticipate trends in technology and next-generation requirements and help sponsors adapt their programs for the future
- Develop prototype tools and methodologies, from biotechnology to sophisticated modeling and simulation environments, to support sponsor work
- Share research results broadly through publications, conferences, and participation in standards bodies and technology exchange events
- Work closely with sponsors, using real data in experiments and bringing in end users to test our prototypes
- Share MITRE intellectual property with the government and license it to industry, as appropriate, to spur product introductions that meet our sponsors' needs
- Collaborate with government, academia, and industry—from technology incubators to established companies



Investing in the Future

MITRE has 18 mission-focused and core technology innovation areas:

- Agile Enterprises
- Anti-Access/Area-Denial (A2AD)
- Aviation and Transportation
- Communications and Networking
- Critical Infrastructure Security and Resilience
- Cyber Community Research and Transition
- Cyber Effects
- Cybersecurity
- Data to Decisions
- Electronic Systems and Technology
- Future of Command and Control
- Health Transformation
- Information Technology
- Integrated Sensing, Processing, and Exploitation
- International Research and Development
- Software Engineering
- Technology Futures
- Trustworthy Autonomy

2016 Tech Transfer

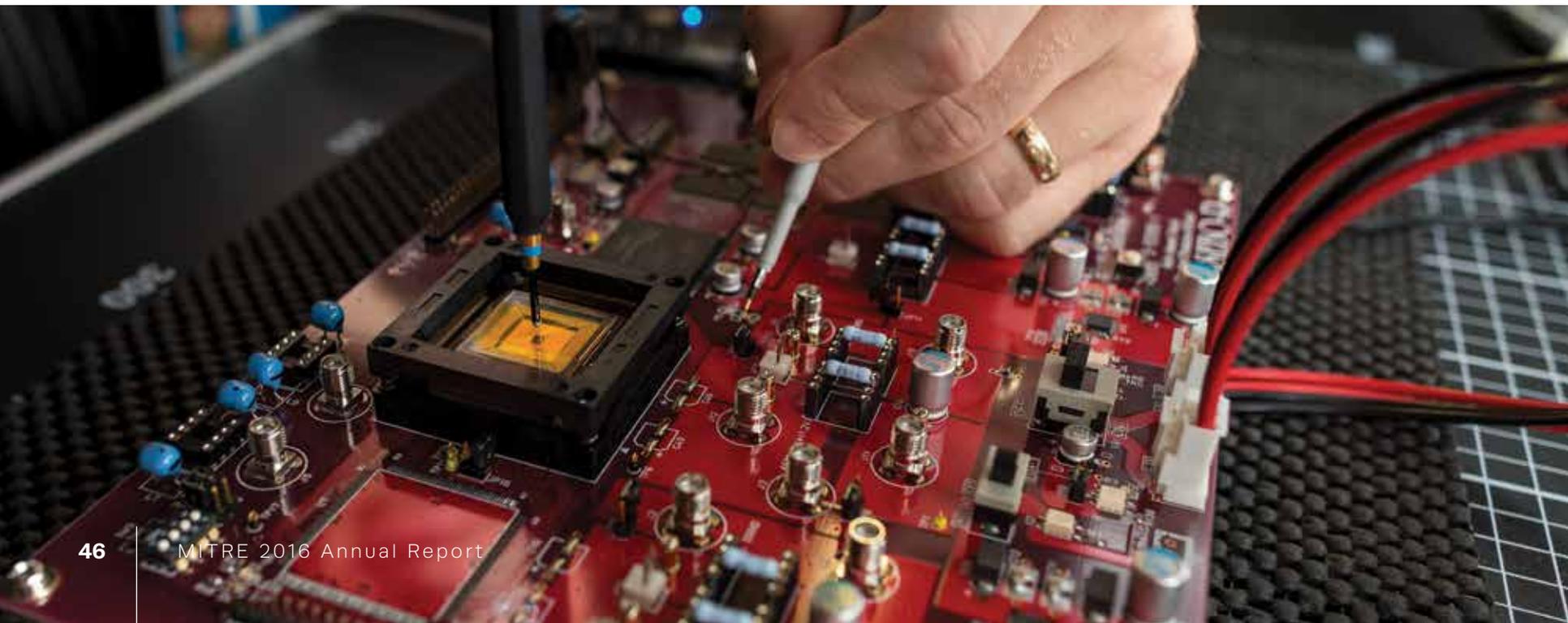


MITRE
executed
125
licenses
during **FY16**

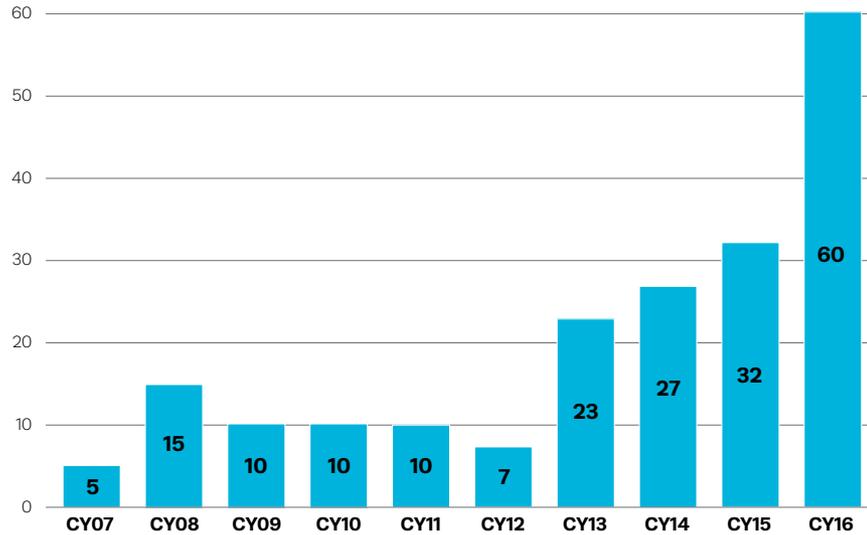
MITRE understands that, as we work on critical issues in our sponsors' interest, we must serve as an innovation bridge in discovering externally developed technologies of interest while simultaneously transferring the innovations that we develop. Recognizing that our innovations often need to be instantiated in supported commercial products, we enacted our technology transfer policy in 1971, well before the more recent legislation in this area.

Our technology transfer program is an effective way to direct MITRE-developed technologies into the hands of commercial companies that will make them available to our sponsors—and in many cases the public—as affordable, supported products because full-scale development and commercialization are not part of MITRE's mission.

The program is also a catalyst for economic growth and potential job creation, so we return additional value from the receipt of federal funds. As a result, there are many avenues through which MITRE's intellectual property reaches those who need and can use it to deliver outcomes. ■

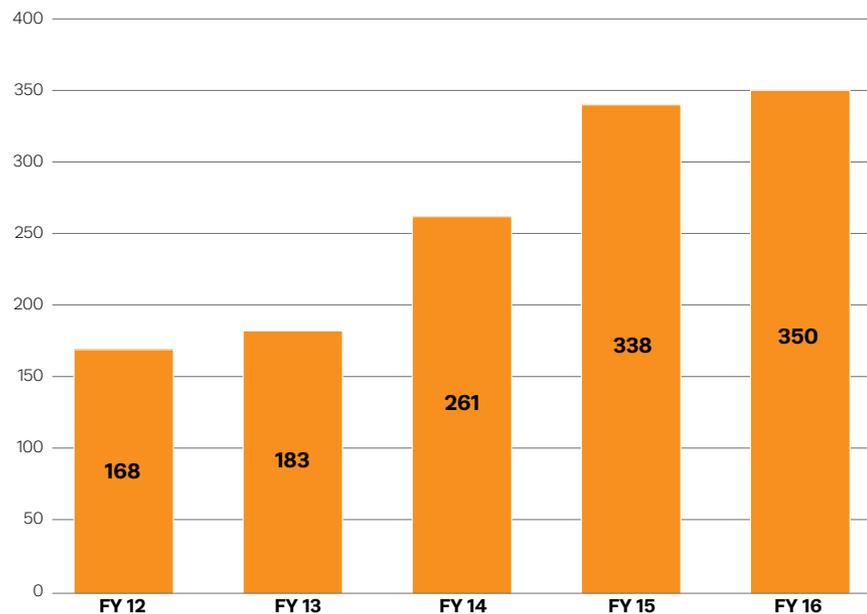


Estimated New Jobs Per Year



Another benefit of transferring technology to the commercial and public domains is economic; when commercial companies license our technology and produce new products, they add jobs to the economy. In 2016, just eight of the products that contain MITRE technology produced 60 jobs.

Commercialization



To accelerate commercialization of its technology, MITRE has increased the number of Intellectual Property Disclosure Forms, patents, and licenses it applies for and produces each year.



“MITRE does do interesting research and thought work... they deserve a lot of credit for helping get ADS-B off the ground. Their work is good ‘fire starter’ that industry then invests a lot in to refine and makes suitable for the market.”

–Tyson Weihs, co-founder and CEO of ForeFlight

The MITRE Challenge

MITRE's Countering Unauthorized UAS Challenge attracted a variety of innovators from around the world. The use of small Unmanned Aircraft Systems (UAS) within the United States and across the globe is growing quickly. Government, industry, and hobbyists are finding many ways to use these small aircraft. However, we are also seeing unauthorized uses—resulting in drones that potentially threaten the safety of aircraft in the national airspace and create security concerns by operating near sensitive locations. The potential for nefarious use of this technology has become a major safety and security concern for multiple federal agencies.

The MITRE Challenge team put out a call for solutions to detect and safely interdict small UAS (weighing less than 5 lbs.) that pose a potential safety or security threat in urban areas. We asked for innovative solutions that were affordable, technologically scalable, and workable in domestic environments.

Forty-two contestants from eight countries submitted white papers outlining their approach, and the Challenge Team and a panel of domain and technical experts from MITRE and U.S. federal agencies selected eight finalists to compete in a live flight event in August at the Marine Corps Base Quantico Urban Training Center. A MITRE red team flew the same four scenarios against each team; the scenarios featured different drones and techniques that represented realistic attack schemes.

We achieved our goal to help the government and MITRE better understand the state of technologies that could be deployed across the United States and in foreign urban environments, and we will continue to work with sponsors to find and adapt the best solutions. ■



Projected
value of the
drone industry
by 2020:

\$127
billion



Internet of Things (IoT) devices—from garage door openers to medical monitors to factory alerts—are becoming more and more ubiquitous. Unfortunately, so are warnings of the devices' cyber vulnerabilities and actual attacks.

The IoT's innumerable interconnections of devices, or "things," will lead to new efficiencies and capabilities, but the ability to manage the IoT to ensure security and privacy within different operating systems and environments poses significant challenges.

The MITRE Challenge put out a call for possible solutions to this potential threat so our sponsors can reap the benefits of this technological evolution, while minimizing the risks.

Winners will be announced in early 2017. ■



MITRE's Unique
Identification of
IoT Devices
Challenge
attracted
participants from
33 countries
around the world



Gartner forecasts
there will be **21**
billion connected
things worldwide
by 2020



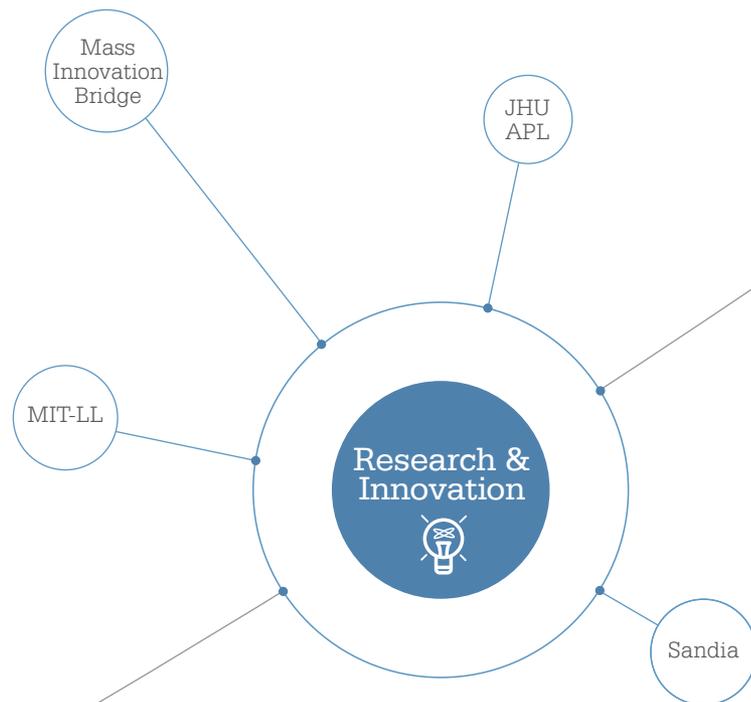


Partnering for Impact

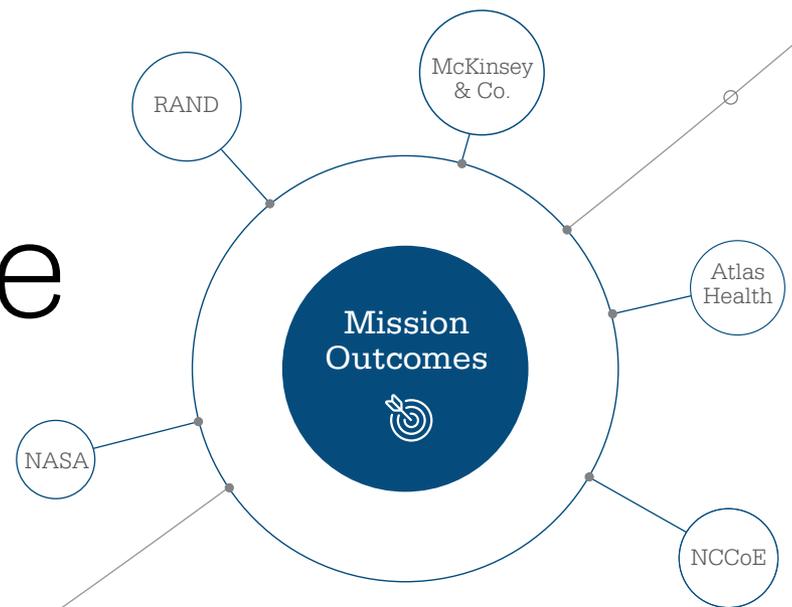
The challenges and opportunities of today and the future are best addressed by networks of organizations. MITRE, consistent with our public interest charter, works with a variety of businesses, organizations, and institutions to both form and contribute to partnerships between the public and private sectors that achieve outcomes for our government and the public it serves.

We Partner Around the Globe

2016 Highlights

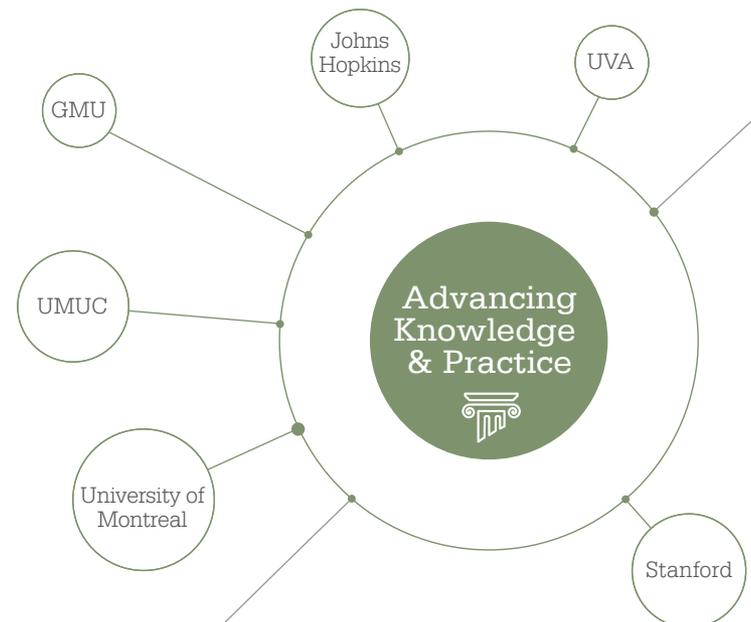


Massachusetts Innovation Bridge is a partnership between the Commonwealth and MITRE that will help federal agencies solve the nation's most difficult challenges by tapping into the world-leading innovation and high-tech ecosystem in Massachusetts, while creating new business opportunities in the Commonwealth.



MITRE has been working with **McKinsey & Co.** as a partner and leader in strategic analysis and organizational change across our health and human services program on areas such as improving the sustainability of rural healthcare and transforming public health surveillance.

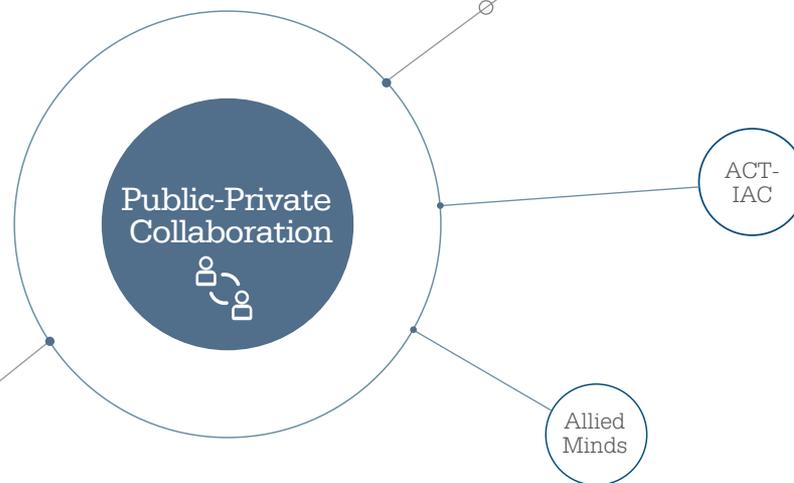
The University of Montreal's Cyberjustice Laboratory signed a memorandum of understanding with MITRE to enhance access to justice and support the rule of law locally and abroad.



MITRE collaborates with the **Northern Virginia Technology Council (NVTC)** on the Veterans Employment Initiative, which includes VETWORKING, a free boot camp designed to support veterans with a seamless transition from active duty to a successful career.



The MITRE Corporation and the Canberra-based **Australian Strategic Policy Institute (ASPI)** announced their agreement to cooperate for the advancement of shared Australian and U.S. interests. Both are not-for-profit entities that work in the public interest by addressing complex, national-level challenges for government.



An agreement between **Allied Minds** and MITRE gives Allied Minds a first look at and exclusive access to certain technologies in MITRE's intellectual property portfolio. Allied Minds' relationship with MITRE is one of several arrangements that Allied Minds has with federally funded research labs, each of which is structured to help create a platform for technology transfer, as well as new company creation.







MITRE People

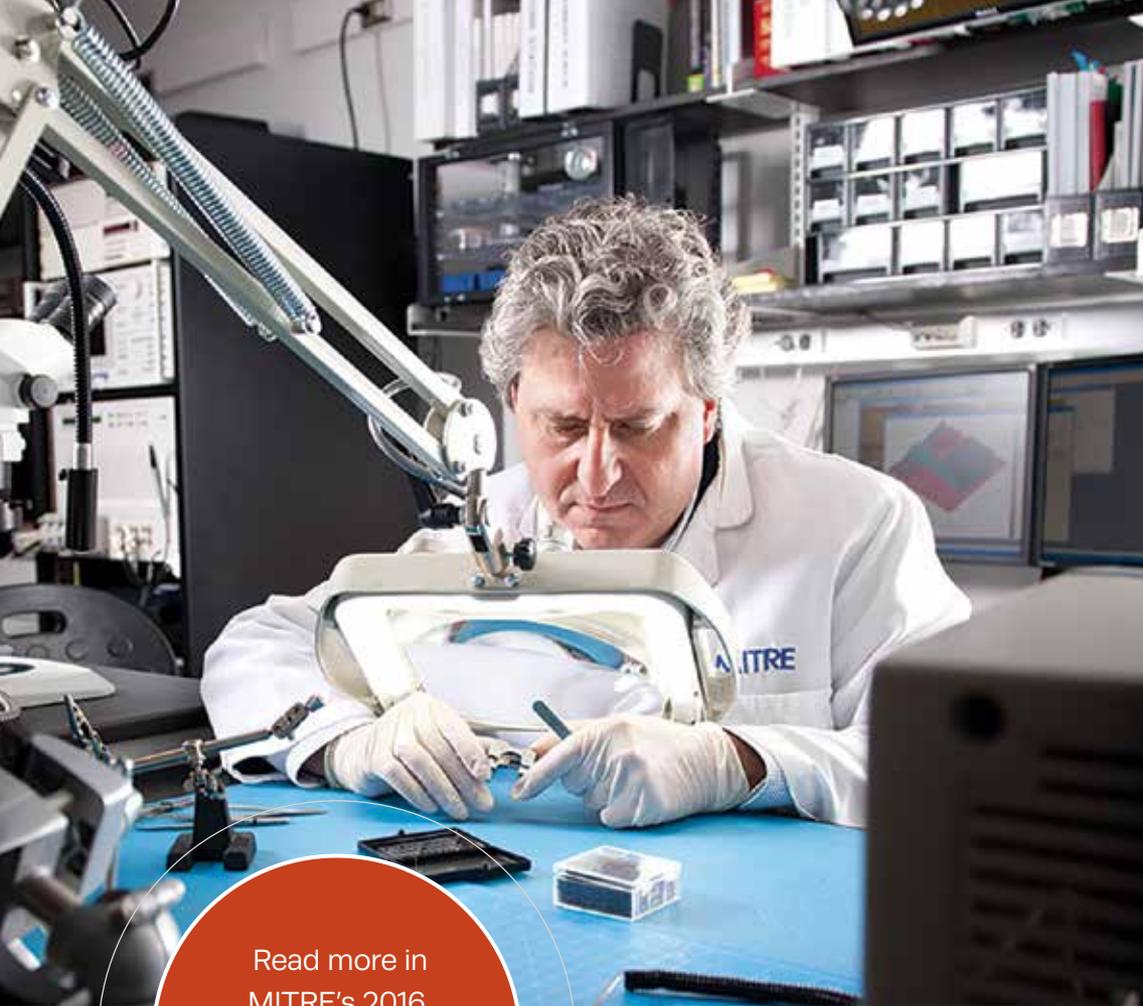
We employ a diverse group of highly educated professionals who combine first-rate technical and organizational know-how with an enthusiasm for serving in the public interest.

Our People

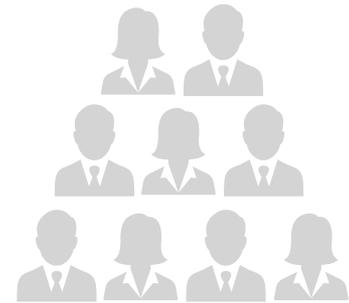


At MITRE, we believe that bringing together bright individuals with a variety of backgrounds, perspectives, and work styles leads to the most innovative solutions. By drawing on a wealth of experiences and ideas, we ensure that no potential solution gets overlooked. Put innovative tools into the hands of talented people in a collaborative environment, and there are no problems they can't solve.





People by the Numbers



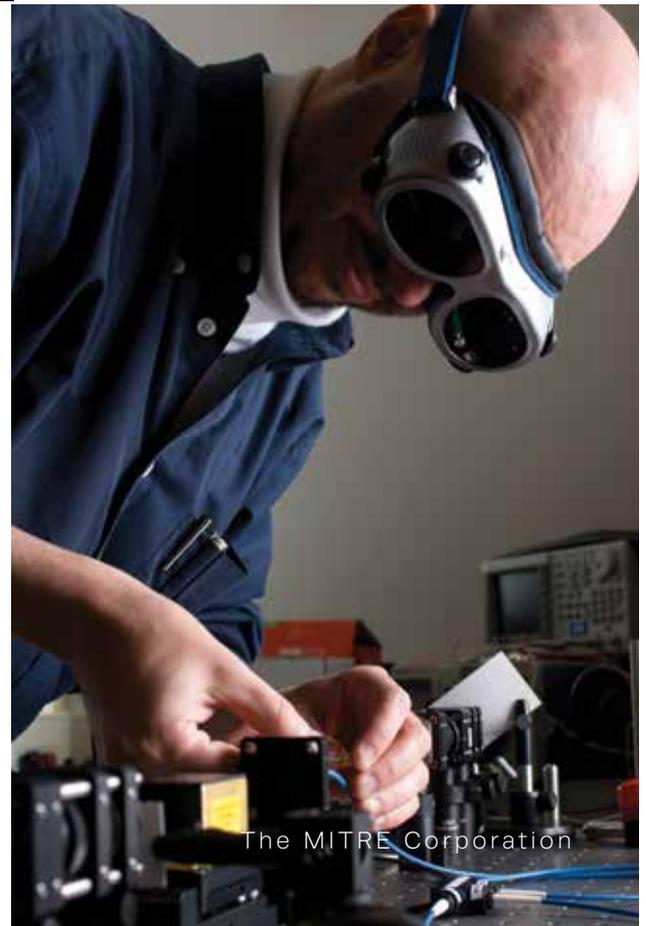
8,205
total staff

Read more in
MITRE's 2016
Corporate Social
Responsibility
Report

MITRE is committed to fostering a culture of diversity and inclusion. That commitment is embedded in our corporate values and in our goals. We believe our diverse workforce helps MITRE realize its fullest potential.



85%
say **MITRE**
is a **Great**
Place
to Work







2016 at a Glance

2016 was marked by
numerous awards, media
interactions, and growth.



2016 Workplace Awards & Recognition

- STEM Workforce Diversity Magazine: Top 50 Employers
- NVTC Veterans Employment Initiative Veteran Service Award
- Commuter Connections Employer Recognition Award
- 2016 Washington Post Top Workplaces
- 2016 Computerworld 100 Best Places to Work in IT
- 2016 InformationWeek Elite 100 for Innovative Technology
- Forbes: America's Best Employers
- San Antonio Express-News Top Workplaces for 2016
- Massachusetts ECO Program Pinnacle Award
- 2016 Boston Globe Top Places to Work

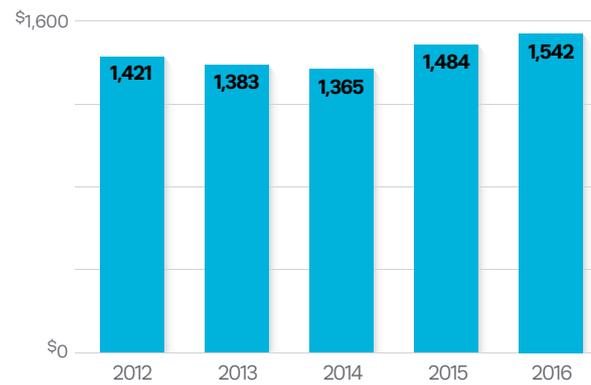




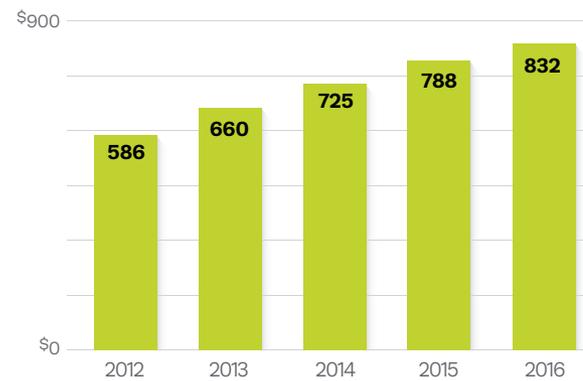
Financial and Staffing Data



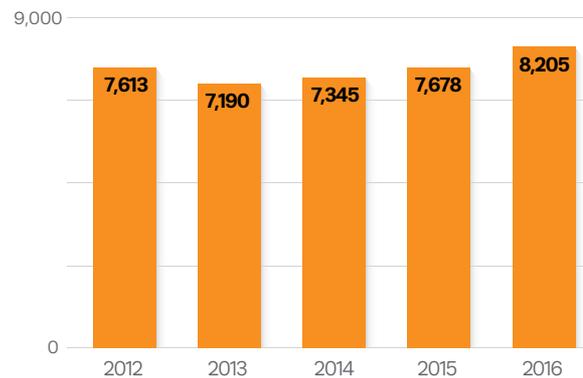
Total Revenue (\$ in millions)



Total Assets (\$ in millions)



Total Staff (Year-End)



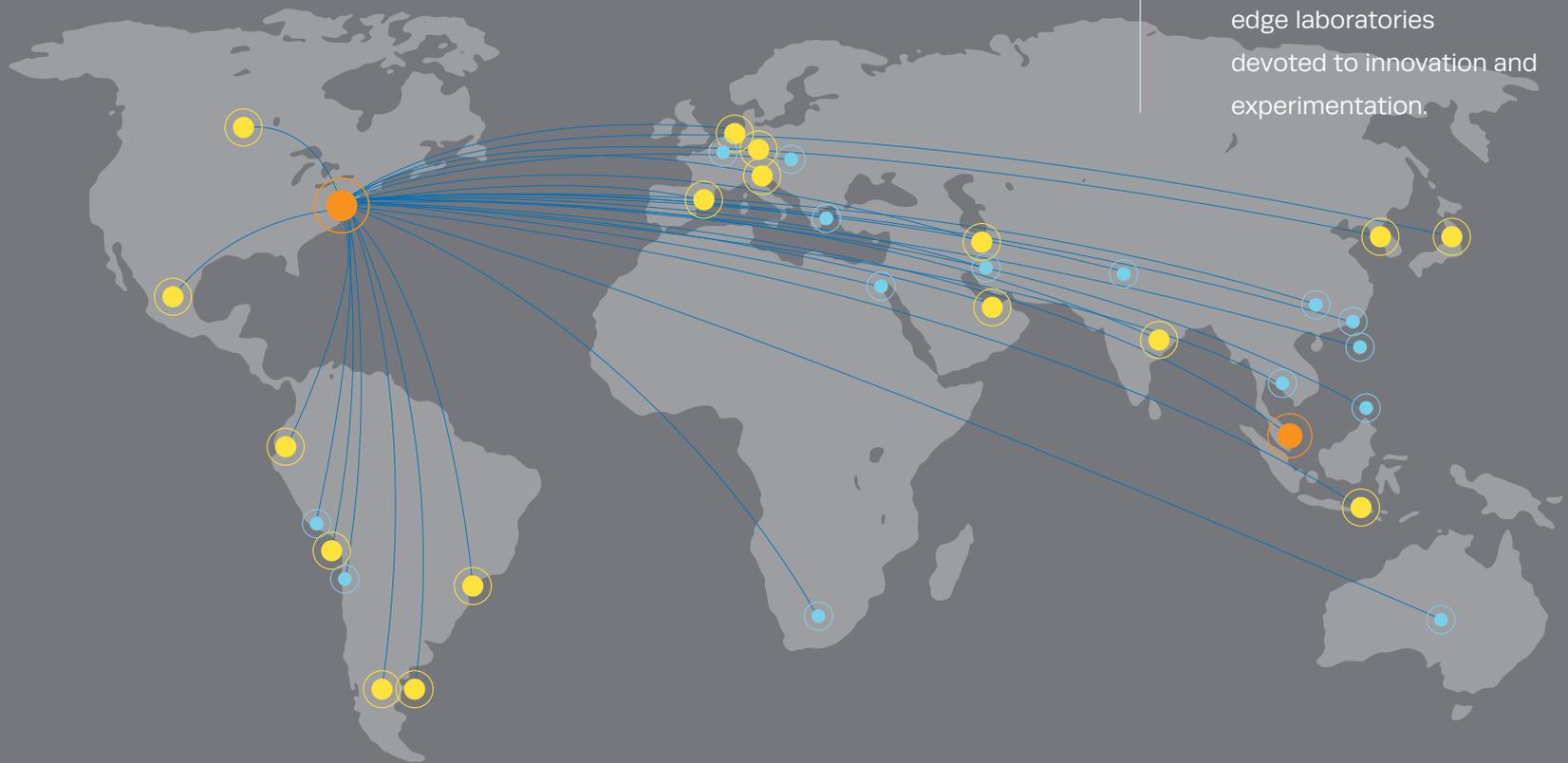
MITRE's revenue from operations increased 3.9% from \$1,484 million in fiscal year 2015 to \$1,542 million in fiscal year 2016. The year-over-year increase in revenue was driven primarily by increased work mainly with the Departments of Defense, Homeland Security, and Health and Human Services and Medicare & Medicaid Services areas. This growth more than offset the reduction of revenue due to MITRE's conclusion of the independent assessment of the Department of Veterans Affairs' healthcare system through the Veterans Access, Choice, and Accountability Act of 2014 (known as VA Choice). Assets increased year-over-year by \$44 million, driven primarily by increases to property, plant, and equipment related to ongoing building construction as the company works to consolidate its McLean, Virginia, operations onto its main campus. Staff population increased year-over-year, which reflects current and anticipated demand and shifts in the work program.

Locations

MITRE is headquartered in Bedford, Massachusetts, and McLean, Virginia, with our newly established R&D site in Singapore. We have sites across the country and the world.



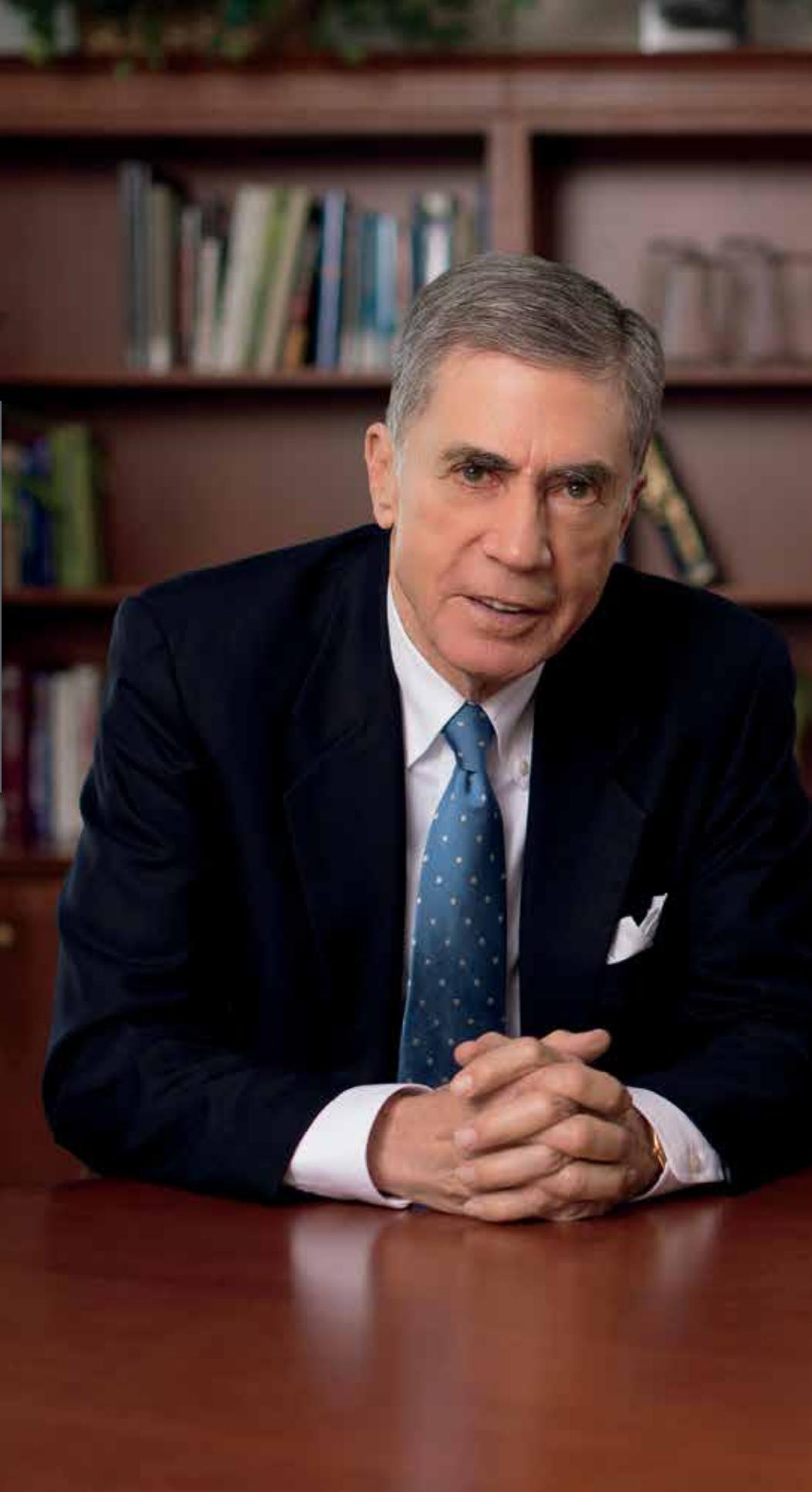
MITRE 4 opened in fall 2016 and consolidates nearly all McLean-based employees on one campus, enhancing our collaboration and knowledge sharing. The environmentally friendly building is dedicated to long-term chairman James Schlesinger and includes several cutting-edge laboratories devoted to innovation and experimentation.





MITRE Leadership

MITRE's leaders manage the government's investment in us wisely, ethically, and responsibly. Our executive team, together with our Board of Trustees, brings the high level of expertise needed to tackle the government's biggest challenges and achieve mission success.



With Appreciation

The Honorable Charles Robb joined MITRE's board in 2001, and during his tenure he brought valuable insight as the first U.S. Senator to simultaneously serve on the Armed Services, Foreign Relations, and Intelligence Committees.

We were fortunate to have his leadership as vice chairman from 2006 through 2014 and as chairman until his retirement in October 2016. To recognize his service to the company, we have dedicated the auditorium in the new MITRE 4 building in his name and are establishing a National Merit scholarship for the children of MITRE employees.

Executive Team



Mr. Alfred Grasso
President and
Chief Executive Officer



Mr. Paul Bielski
Executive Director, Judiciary
Engineering and Modernization Center



Ms. Julie Bowen
Vice President, General Counsel,
and Corporate Secretary



Mr. Richard Byrne
Senior Vice President, Programs and
Technology, Center for Connected
Government



Mr. James Cook
Vice President and Director,
Center for Enterprise Modernization



Dr. Gregory Crawford
Vice President, Joint and Services
Portfolio, National Security
Engineering Center



Ms. Julie Gravalles
Vice President and Chief Human
Resources Officer



Dr. Stephen Huffman
Senior Vice President and General
Manager, Center for National Security,
and Director, National Security
Engineering Center



Mr. Joel Jacobs
Vice President and
Chief Information Officer



Mr. Robert Jensen
Vice President and Director,
CMS Alliance to Modernize Healthcare



Mr. Mark Kontos
Senior Vice President, Chief Financial
Officer, and Treasurer



Mr. John M. Kregar
Vice President and Director, Homeland
Security Systems Engineering and
Development Institute



Dr. William LaPlante

Vice President, Intelligence Portfolio,
National Security Engineering Center



Ms. Sarah MacConduibh

Vice President, Air Force Portfolio,
National Security Engineering Center



Dr. Mark Maybury

Vice President and Director,
National Cybersecurity FFRDC,
and Chief Security Officer



Dr. Jason Providakes

Senior Vice President and General
Manager, Center for Connected
Government



Ms. Lillian Zarrelli Ryals

Director, Senior Vice President, and
General Manager, Center for Advanced
Aviation System Development



Dr. Jay Schnitzer

Vice President and Chief
Technology Officer



Mr. Peter Sherlock

Senior Vice President,
Programs and Technology,
Center for National Security



Mr. Joseph Sinnott

Executive Director, Center for
Advanced Aviation System
Development



Mr. John A. Wilson

Vice President, Programs and
Technology, Center for National
Security

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Previous positions:

President, The Cooper Union for the Advancement of Science and Art

President and CEO, National Action Council for Minorities in Engineering, Inc.

U.S. Delegate, International Telecommunications Union



Mr. Nicholas M. Donofrio

Previous position:

IBM Executive Vice President, Innovation and Technology



Mr. Robert R. Everett

Honorary Member

Previous position:

President, The MITRE Corporation



Ms. Michèle Flournoy

Co-Founder, Center for a New American Security

Senior Adviser, Boston Consulting Group

Previous positions:

Under Secretary of Defense for Policy

President, Center for a New American Security

Senior Adviser, Center for Strategic and International Studies



Mr. David G. Fubini

Senior Lecturer, Harvard Business School

Director Emeritus, McKinsey & Company



Ms. Jane F. Garvey

North America Chairman, Meridiam Infrastructure

Previous positions:

Executive Director, JP Morgan Securities, Infrastructure Advisory Group

Administrator, Federal Aviation Administration

Acting Administrator, Federal Highway Administration

(Retired from Board in 2016)



Adm. Edmund P. Giambastiani, Jr., U.S. Navy (Ret.)

Previous positions:

Seventh Vice Chairman of the Joint Chiefs of Staff

NATO Supreme Allied Commander Transformation

Commander, U.S. Joint Forces Command



Mr. Alfred Grasso

President and Chief Executive Officer, The MITRE Corporation



Mr. George C. Halvorson

Previous position:

Chairman and Chief Executive Officer, Kaiser Permanente



Dr. John J. Hamre

President and Chief Executive Officer, Center for Strategic and International Studies

Previous position:

Deputy Secretary of Defense

(Named Chairman in 2017)



Gen. C. Robert Kehler, U.S. Air Force (Ret.)

Previous positions:

Commander, U.S. Strategic Command

Commander, Air Force Space Command



**Dr. Donald M. Kerr
Vice Chairman**

Previous positions:

Principal Deputy Director of National Intelligence

Director, National Reconnaissance Office

Deputy Director for Science and Technology, Central Intelligence Agency



Mr. Cleve L. Killingsworth

Previous positions:
Chairman and Chief Executive Officer,
Blue Cross Blue Shield of Massachusetts
President and Chief Executive Officer,
Health Alliance Plan



**Gen. Robert T. Marsh,
U.S. Air Force (Ret.)**
Honorary Member

Previous positions:
Executive Director, Air Force Aid Society
Commander, Air Force Systems
Command



**Gen. Montgomery C. Meigs,
U.S. Army (Ret.)**

Visiting Professor in the Lyndon B.
Johnson School of Public Affairs,
University of Texas
Previous positions:
President and Chief Executive
Officer, Business Executives for
National Security
Director, Joint IED Defeat
Organization, Office of the
Secretary of Defense



Ms. Cathy Minehan

Managing Director of Arlington
Advisory Partners, LLC
Previous Positions
Dean, Simmons College
School of Management
President and CEO, Federal
Reserve Bank of Boston



Dean Elizabeth Rindskopf Parker

Dean Emerita of the McGeorge School
of Law at the University of the Pacific
Previous positions:
General Counsel, National Security Agency
Principal Deputy Legal Adviser,
U.S. Department of State
General Counsel,
Central Intelligence Agency



**Senator Charles S. Robb
Chairman**

Distinguished Professor of Law
and Public Policy, George Mason
University, School of Law
Previous positions:
U.S. Senator
Governor of Virginia
(Retired from Board in 2016)



The Honorable Mike Rogers

National Security Commentator
Previous Positions
Congressman
Founder, Mike Rogers Center for
Intelligence and Global Affairs



Ms. Mary Schapiro

Vice Chairman, Advisory Board of
Promontory Financial Group
Previous positions:
Chair, U.S. Securities and
Exchange Commission
Chair, Commodity Futures
Trading Commission
Chair and CEO, National Association
of Securities Dealers



Mr. Rodney Slater

Partner, Patton Boggs
Previous positions:
U.S. Secretary of Transportation
Director, Federal Highway
Administration



Mr. John P. Stenbit

Previous positions:
Assistant Secretary of Defense for
Command, Control, Communications,
and Intelligence
Executive Vice President, TRW

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GEN Scott Wallace, USA (Ret)

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Gen Donald Hoffman, USAF (Ret)
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Gen Norton Schwartz, USAF (Ret)

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ADM Gregory (Grog) Johnson, USN (Ret)
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Chancellor Robert Caret
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Dr. Wallace Loh
Ms. Teresa Lupinek
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Ms. Susan Marinoff

Sustainability

Sustainability

The MITRE Corporation is committed to the development of a sustainable environment. The printing company is certified by the Forest Stewardship Council®.

The 2016 MITRE Annual Report was printed using paper with 10% post-consumer recycled fiber on McCoy Silk, manufactured by Sappi Fine Paper North America, in the USA.



MITRE

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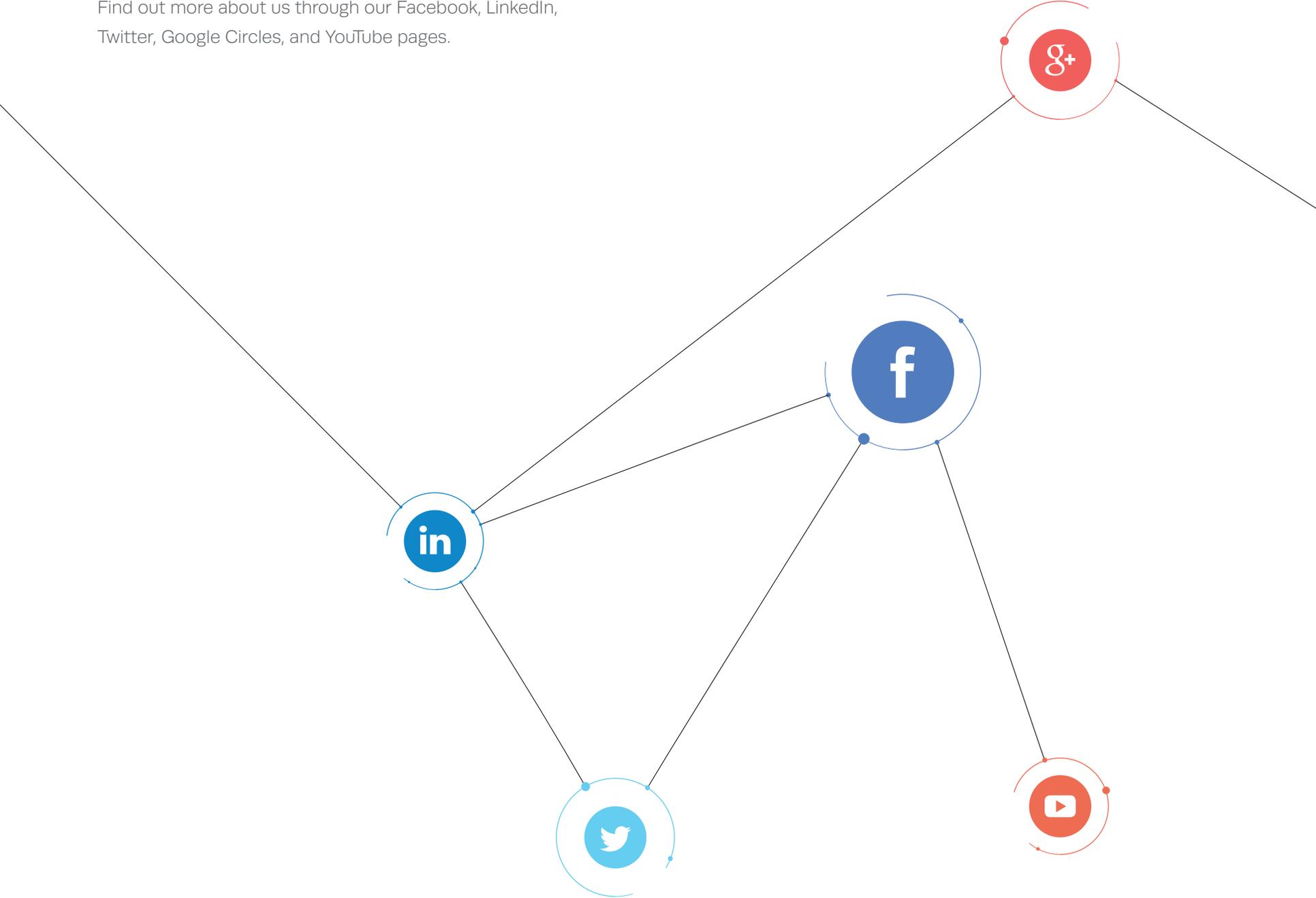
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